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University teachers' self-perception of digital research competencies. A qualitative study conducted in Peru

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Previous research warns about the limitations that some university teachers in Ibero-America have in relation to digital research competencies. The objective of this research was to analyze the research competencies from the university teacher's self-perception, contrasted with the classroom evaluation. The study had a qualitative approach. Interviews were conducted *via* the Zoom virtual platform, and recordings (of an average of 4 h each) of classes delivered by 10 teachers with an average age of 58 years old, in charge of scientific research courses at the postgraduate level in Peruvian universities were analyzed. The instruments used included an in-depth interview guide and a checklist. The results show that university teachers perceive themselves as specialists in the area of research, however, they present limitations when transmitting knowledge during the teaching-learning process. There is evidence of a lack of pedagogy, as well as limitations in the use of digital resources and technological tools due to their resistance to change. The conclusions reveal that it is key to make teachers aware of the paradigm shift, with a teaching that includes as digital competencies: knowing how to create and manipulate data, knowing how to use programs and information systems, knowing how to socialize and collaborate in digital environments, knowing how to exercise and respect a digital citizenship, knowing how to manage knowledge assertively, and, as we propose in this paper, knowing how to be a researcher in a digital environment.

KEYWORDS

digital competencies, research competencies, university teacher, self-perception, classroom evaluation

Introduction

The competencies of university teachers are capabilities and skills that the professional assumes to successfully perform his or her educational role (Guasch et al., 2010; Sirotová, 2016). Research competency is the set of skills, knowledge, and attitudes to enable the confident, creative, and critical use of technologies and systems in an increasingly digital world (Welsh Government, 2018). Among the competencies of university teachers are digital research competencies, which are categorized into informational competencies and the use of technology (Ramírez-Armenta et al., 2021), which must be in tune with the expectations of digital native learners (Vitvitskaya et al., 2022).

Recent research on competencies in the use and mastery of technology describes the limitations of university teachers. A previous study conducted in Ecuador in relation to the digital competencies of university teachers, showed the need to evaluate digital competencies from the level of training, type of university, years of service, level of experience, discipline, cultural context, among others, in order to predict the nature of the use of digital technology in the teaching-learning process (Basantes-Andrade et al., 2020). Similarly, Ramírez-Montoya et al. (2021) analyzed the teaching profile from the perspective of a specialized professional, with innovative skills, complex problem solving, entrepreneurship, collaboration, international approach, leadership, and connection with social needs. In that country, as in its Latin American neighbors, higher education institutions are called upon to take on the challenge of training and updating the knowledge of teachers, enabling them to develop digital competencies. Due to the respect for laws related to university autonomy, national institutions that ensure the quality of education require only reports with evidence of training. There are no clear requirements on what content should be included in training plans, so each university develops its own training plan with the topics that are assumed to be the priorities, with differences between institutions.

Another previous study, conducted in Spain, was able to successfully deepen on the digital competences used by university teachers during the evaluation system where they integrate applications and mobile devices (Rodríguez-Hoyos et al., 2021). In the same country, another study, this time with a quasi-experimental design, evaluated the digital competences of teachers to know the development of this competence from face-to-face and virtual education; its results showed low scores in the virtual education group, both in the pre-test and post-test; concluding that the lack of digital training of teachers with traditional methodological practices limit the effectiveness of learning (Romero Tena et al., 2021). Also, in Spain, a study was conducted with a sample of 230 university teachers, the results showed that the teacher's perception of skills does not correspond to the evidenced (García-Llorente et al., 2020).

Digital competencies during teacher training, should be a responsible priority for the development of optimal processes (Cobo, 2019; Girón-Escudero et al., 2019; Suyo-Vega et al., 2022).

In Mexico, a study was conducted on research competencies in the use of ICTs, highlighting the opportunities to face situations during the research process, which is carried out through the socialization of information, identification of groups participating in congresses and with scientific publications, and others who lack knowledge or interest in developing it (George-Reyes and Salado-Rodríguez, 2019; Vitvitskaya et al., 2022).

The term research competence in relation to the digital environment was coined as a process that begins with the analysis, reflection and assessment to disseminate knowledge (Ilomäki et al., 2016; Çebi and Reisoglu, 2020).

The digital skills acquired by the university teacher allow the development of new knowledge and make the most of the potential of technologies and increase the level of digital literacy (Rama, 2014; Silva Quiroz and Lázaro-Cantabrana, 2020; García Vélez et al., 2021). Research conducted in the early phases of the COVID-19 pandemic identified a growing gap between those with and without resources and technology training in the Americas and the Caribbean; however, the need to continue educational service motivated educational institutions to provide ongoing training for teachers and students, which favored digital technological inclusion (Robinson et al., 2020). Technology, in conjunction with knowledge management, improves the quality of intellectual outputs produced by both teachers and university students.

Similarly, the lack of familiarity with the terminology information literacy is a latent problem in university teachers and students, since the terms bibliography, citation, keywords, full text, abstract, database, peer review, journal, catalog, open access, journal title, scholar, source, among others, should be cultivated during academic training (Morales and Rivoir, 2020; Cantú Mata et al., 2021). Therefore, information literacy should be established as a transversal axis in all actors of the university community (Schaub et al., 2017). From what has been expressed, the need to develop informational competencies is broken down, which includes the analysis of impact and indexed journals, which serve as theoretical support and easy access, with the use of bibliographic managers such as Mendeley, Zotero, EndNote, Biblioscape, among others.

Likewise, the aforementioned cases should motivate the insertion of technologies in the university environment, since it generates changes in the way of learning, teaching and researching. In the university environment there is a need to search, select, and organize, and then analyze the vast amount of relevant information and subsequent dissemination of findings (George-Reyes and Salado-Rodríguez, 2019; Alva de la Selva, 2020; Escofet, 2020).

TABLE 1 Variable, category referred to, and competencies (subcategory) in theoretical bases.

Variable	Category referred to	Competencies (subcategory)
Research competencies	Information competence and technology use	Knowing how to create and manipulate a data set
Research competencies	Information competence	Knowing how to use specialized software and information systems
Research competencies	Technology use	Knowing how to socialize and collaborate in digital environments.
Research competencies	Technology use	Knowing how to exercise and respect digital citizenship
Research competencies	Information competence and technology use	Digital literacy

TABLE 2 Characteristics of each teacher participating in the study.

Number	Age	Sex	Education level	Dedication	Type of university	Years of experience in university teaching	Number of publications indexed in Scopus
1	50 years old	Male	Doctorate degree	Full time	Private	4 years	0
2	56 years old	Male	Master's degree	Full time	Private	8 years	0
3	51 years old	Male	Doctorate degree	Full time	Private	5 years	2
4	61 years old	Male	Doctorate degree	Full time	Private	14 years	1
5	64 years old	Female	Doctorate degree	Full time	Public	11 years	1
6	68 years old	Female	Doctorate degree	Full time	Public	32 years	2
7	63 years old	Female	Master's degree	Full time	Private	3 years	1
8	52 years old	Female	Master's degree	Part time	Private	2 years	0
9	58 years old	Female	Doctorate degree	Full time	Private	7 years	0
10	57 years old	Female	Doctorate degree	Full time	Private	16 years	0

Thus, the development of inquiry processes should be a central activity in the university field, where teachers and students should develop knowledge in connection with the use of technology, in the virtual modality (George Reyes and Ramírez Martinell, 2019; Fernández Tapia, 2021; Contreras Pardo and Vera Sagredo, 2022). It is necessary to promote in teachers a renewed commitment to knowledge and information, allowing them to assume specific competencies (Villarreal-Villa et al., 2019). Ongoing teacher training and updating allows the acquisition of digital competencies (Cabero-Almenara et al., 2019; Morales and Rivoir, 2020; Alvarez-Flores, 2021; Barragán Sánchez et al., 2022).

This research has theoretical justification (Fernández Bedoya, 2020). There is still a gap in the literature related to the self-perception of digital research competencies, with emphasis on Latin American countries such as Peru. In view of the above, it is necessary to investigate with orientation the work of university teachers, in relation to informational competencies, which are linked to research activities (De los Santos Lorenzo and Martínez Abad, 2021). The following research questions were posed: How does the university teacher perceive himself/herself on digital research competences? What deficiencies does the university teacher present in the observed class sessions? How to improve the digital research competences of the university teacher? The answers of the participants and the observation carried out in the classroom, seek to answer the questions to analyze the limitations and enhance the digital research skills that remain in constant evolution.

TABLE 3 Date of interview and classroom observation for each of the subjects interviewed.

Code	Date of interview	Date of classroom observation
I50M1	September 2nd	September 9th
I56M2	September 3rd	September 16th
I51M3	September 10th	September 23rd
I61M4	September 17th	September 30th
I64F1	September 24th	October 1st
I68F2	September 30th	October 7th
I63F3	October 14th	October 8th
I52F4	October 14th	October 15th
I58F5	October 21st	October 29th
I57F6	October 28th	September 9th

TABLE 4 Strategies followed to ensure methodological rigor and trustworthiness.

Criteria	Strategy	Activities performed
Credibility	Prolonged engagement	Throughout the 10 weeks of data collection, there was constant contact with the 10 members of the study. Some of them even told us about their motivation and desire for constant improvement and future plans.
Credibility	Persistent observation	The interview and the hours of class recordings provided a lot of varied information of the highest quality, so we had to focus only on what was necessary to answer the research questions posed. Non-relevant data was separated out.
Credibility	Triangulation	We employed triangulation of data, investigator, and method.
Credibility	Member check	We ensured that the questions used were fully understood by the interviewees through confirmation.
Transferability	Thick description	We have added as much of the context of the study as possible so that readers can understand the situation of university teachers as a whole.
Dependability	Quality of results	The results presented were drawn solely from the data collected.
Confirmability	Audit trail	All the steps followed are clearly established in the methodology, and the research instrument is presented in this scientific article.

TABLE 5 Answers on information competence for each of the subjects interviewed.

Code	Respondent's answers on information competence
I50M1	I identify some databases, but I handle very well the ones related to my specialty.
I56M2	I receive updates, I attend the trainings provided by the university and therefore I am very well-informed.
I51M3	I use the main indexed databases and handle statistical packages efficiently.
I61M4	I manage updated information, analyzing, evaluating and processing it to develop a good research product.
I64F1	During the academic training of students, I ensure the use of scientific articles and systematic reviews to enhance the knowledge and methodologies that have been used on the topic to be investigated.
I68F2	I am constantly performing technological surveillance, in order to have high-level scientific production resources.
I63F3	I consider that it is necessary to develop skills to perform searches in the main databases, so I consider that permanent updates are essential to efficiently manage information.
I52F4	I use strategies to search for information, because I consider them necessary to reduce time. It allows me to refine the search, I delimit the subject matter and/or the specific line of search.
I58F5	The scientific articles I select are transcendent, since they help develop the student's critical thinking and strengthen the skills for knowledge on the subject.
I57F6	I consider the need to have skills in the use of data managers to sort the information. I select scientific articles, review the abstracts, keywords, DOI or links of the article, verifying if it is an article or part of a book, and check the names and surnames for the correct citation.

Materials and methods

The research was developed under the qualitative approach, which contributes to the consolidation of different prior knowledge on the subject (Salgado Lévano, 2007).

The research presents an exploratory level, which began with the formulation of the research problem and continued with the mapping and approach to the object of study, and continued with the sampling of characteristics of being open, relational-fluctuating and discriminative (Quintana Peña, 2006).

For the collection of information, in-depth interviews were designed to identify meanings and conceptions about the subject of study (Troncoso-Pantoja and Amaya-Placencia, 2017), according to the variable, category referred to and competencies (Table 1).

The information on teachers' self-perception was collected and divided into categories and subcategories related to information competencies and use of technology. The instrument used (checklist) was used to assess the recorded virtual classroom sessions, contrasting the answers given with the revalidation during the classroom sessions to identify the teachers' deficiencies. In this case, each teacher was asked for links to class recordings created using the zoom program, which had an average duration of 4 h.

Both the interview and observation instruments are attached to this article as Supplementary material. The original language is Spanish, although there is an English version translated by the authors for an international audience.

The information was gathered from 10 university teachers over a 12-week period between July and December of 2021. Due

TABLE 6 Answers on technology use for each of the subjects interviewed.

Code	Respondent's answers on technology use
I50M1	I use search engines specialized in my area of expertise, in order to frame the theoretical framework and methodology to be investigated. I select articles from the last 5 years, organize the information with a data manager, and then analyze the findings of other research as background for possible publications.
I56M2	I consider the databases that are usually known, select the information and references to organize them, then the relevant ones I consider in the research.
I51M3	I have information search skills, I select, organize and plan my possible research, certifying that it is updated and relevant for possible publication in an indexed journal. To date I have published as a co-author of other studies, but I believe I should have more writing experience.
I61M4	I have experience in teaching statistics, I use statistical packages with ease, however, I possess difficulties in article writing, but I consider that my limitations are related to the preparation of the paper. The published article was rejected several times. My persistence gave favorable results and it was published, but not in a high impact journal.
I64F1	I consider that I have skills and abilities for the preparation of scientific articles, but the work pressure for the publication of a scientific article in a high impact indexed journal generates stress, fear, fear of rejection and the probable non-continuity of work. I think that, in order to write an article, one must be emotionally prepared. I consider that my publications are a contribution to society and not the result of work pressure.
I68F2	Moving from the traditional to the technological is a slow process. In my case, writing on paper is easier than using a data manager, but through practice I saw the need to use it and I advise my students to use it in all their writing. Now, I can visualize the origin of each article just by checking the references.
I63F3	I consider that the use of technology is substantial for the various research activities in the university context, being the training the instrument that strengthens the teacher and potentiates the knowledge.
I52F4	I use the data manager under pressure from indexed scientific journals, when I was required to verify each of the references issued. In previous publications it was not necessary to do so.
I58F5	I review scientific articles and I consider that the use of traditional statistics limits the interest of the editors of high impact journals; therefore, I try to update myself and incorporate new statistical software to make the possible publication more interesting.
I57F6	I feel that I have an enormous experience in scientific research, but I have limitations and insecurity that my article will be accepted. I do not have experience in the use of platforms that manage the journals and the language of presentation of the article.

to the late start of classes at various educational institutions, we began in August in some circumstances. The principle of theoretical saturation proposed by Glaser and Strauss was followed (Almarza Franco and Pirela Morillo, 2016).

The main characteristics of the teachers were that they were all graduate-level teachers in charge of courses related to scientific research, mostly women, with an average age of 58 years and with at least 15 years of experience in university teaching. Table 2 shows the particular characteristics of each teacher participating in the study.

Table 3 provides details of the date of the interview and classroom observation for each teacher. Each participant was assigned a code to protect her/his identity. This code details the age and sex of the university professor (e.g., in the case of subject I50M1, the "I" indicates that an interview was applied to him, the "50" that he is 50 years old, the "M" that he is male, and "1" that he is the first male to be interviewed).

Regarding the ethical criteria followed, the researchers guaranteed that the information provided was unpublished and original. For the execution stage, the voluntary collaboration of university teachers was requested, who gave their informed consent, respecting the autonomy, anonymity, dignity, and fairness of the interviewees (Rétali, 2017).

With regard to the criteria of credibility, transferability, dependability, and confirmability, Table 4 shows the strategies followed to ensure methodological rigor and trustworthiness, according to Korstjens and Moser (2018).

Results

The results are divided into two subcategories: Informational competence (Table 5) and technology use (Table 6). The execution took place in two moments: the first comprised the interviews, and the second the review of the recorded sessions of the class.

The university teacher evidences experience in scientific research, but publications in high impact journals are a real challenge for them to consolidate competences in the university environment.

After analyzing the testimonies of the key participants, an evaluation was made of the recordings of the class sessions, which were submitted voluntarily. The purpose was to contrast the development of the sessions, to analyze the development of informational competence and the use of technology (Table 7).

TABLE 7 Recorded classroom observation of university teachers.

Code	Beginning	In process	Achieved	Observation
I50M1		x		The teacher uses the Eric and Scopus databases.
I56M2	x			The teacher incorporates scientific articles in the development of his class.
I51M3		x		The teacher uses the Mendeley data manager, the background information is updated, but the information needs to be synthesized.
I61M4		x		The use of statistics in the teaching-learning process is observed. The teacher incorporates information without taking into account the periodicity.
I64F1		x		The use of the data manager is observed to review the student's product and give conformity to the application of articles. The limitations observed is that it does not distinguish the origin of a high impact scientific article.
I68F2			x	The teacher uses the data manager Mendeley, monitors each part of the citation such as, DOI or link, names and surnames of the authors, journal data, date, volume, number of pages. It has model guidelines for students.
I63F3			x	The teacher complies with the criteria of information search, use of data manager, evaluates and verifies the correct use of the information declared by the students.
I52F4		x		Teacher meets criteria for including research articles. Uses the data manager, but does not monitor the correct citation process.
I58F5		x		The teacher emphasizes the use of statistical packages, but excludes qualitative results. Most of the works developed are quantitative. Uses data manager without the respective monitoring.
I57F6		x		Limitations are observed in the management of the virtual classroom, it does not use the resources of the platform, such as the creation of rooms to verify the progress of each group. The teacher does not check the references.

Finally, we proceeded to the triangulation process of the theoretical bases alluding to self-perception of digital research competencies. From the triangulation, the competencies to be strengthened are shown in Table 8.

Discussion

The results show a redefinition of the self-perception of university teachers, which is a challenge that entails professional competence according to international standards.

In the development of informational competencies, it is evident that the teacher develops them at an acceptable level according to the graduate level. The testimonies prompt reflection and analysis of the phenomenon in Latin American countries such as Peru. A teacher is usually considered a specialist due to his or her work experience and years of teaching a specific course, but without checking whether he or she has published in indexed journals, revealing deficiencies in the development of reading, writing, and scientific writing, among other things. In addition, it was identified that the exhaustive use of digital tools is not always of interest for the purposes of the teacher's research, as referred by the key participants; this is consistent with previous studies in the region, where it is shown that graduate students and teachers only use the tools for research when they are obliged to do so (George Reyes and Ramírez Martinell, 2019). Inclusively, university teachers have limited knowledge about methodologies, data management, specialized software for quantitative and qualitative approaches and data managers, which clearly affect the quality of their manuscripts, not achieving their acceptance for publication (Alvarez-Flores, 2021).

In this regard, the development of digital research competencies implies establishing ethical attitudes in the responsible use of copyrighted information, which should be properly referenced. The key participants indicate that they do not always cite the information they find on the network because they do not know the world citation standards, so they simply take them as a base input to prepare the material for the students, assuming them as their own. The university teacher is capable of performing effective searches, but still requires strengthening information search competencies in specialized journals, which is consistent with the literature explored (George Reyes and Ramírez Martinell, 2019).

To enhance digital research skills, it is necessary to be emotionally and academically prepared to the criticisms of the editor or reviewers of a scientific journal, overcoming the fear of rejection or failure and developing resilience to overcome the challenges involved in a publication (Romero Tena et al., 2021). The use of technology in the research process is not limited to knowing the Internet browser or efficiently using virtual publishing media, because the teacher must develop more

TABLE 8 Analysis of the contrast of the findings of the key participants by competencies.

Code	Suggested competencies	Self-perceived competencies	Observed competencies	Competencies to strengthen
I50M1	Knowing how to create and manipulate a data set.	The teacher indicates that he is a specialist in the area of research.	The teacher presents limitations in the use of digital tools, both for quantitative and qualitative approaches to scientific research.	Develop the use of devices, various digital platforms and software, in relation to quantitative and qualitative approaches.
I56M2	Knowing how to use specialized software and information systems	The teacher knows how to use all the programs for teaching, such as SPSS and Atlas Ti.	The teacher evidences deficiency in the management of information and the use of digital resources. The teacher does not use specialized programs.	Incorporate various programs that enrich the presentation of research, according to the demands of the system.
I51M3	Knowing how to socialize and collaborate in digital environments.	The teacher considers that he socializes, transmits information effectively and uses digital resources, applying didactics in teaching, through the institutional medium.	The teacher socializes the contents through the Blackboard platform and institutional e-mail. The teacher does not use other means of communication.	Use various means of communication such as Facebook, teacher's blogs, WhatsApp, among others.
I61M4	Knowing how to exercise and respect digital citizenship	The teacher believes that he/she has sufficient competences to search for scientific information and uses the references according to the norms of his/her specialty.	It is evident that the teacher in the slides and video presentations does not refer to the information provided to the students.	Incorporate references in the expositions provided to students, such as videos, PPT, among others.
I64F1	Digital literacy.	The teacher perceives that he/she has sufficient strategies and knowledge to find quality scientific evidence.	It is observed that, in the search for information, the Scopus database predominates.	Incorporate other specialized databases according to the subject matter, and promote technological surveillance with continuous training.
I68F2	Knowing how to be a researcher in a digital environment.	The teacher feels that he/she has sufficient experience to approach research.	The teacher shows confidence in his virtual teaching. However, he transmits to the student insecurity and doubts in the face of unanswered questions. Likewise, the teacher issues demands that have not been addressed as prerequisites to elaborate the research product, generating fear and rejection toward research.	Develop soft skills in teachers, strengthen the digital environment to generate motivation and interest in research.

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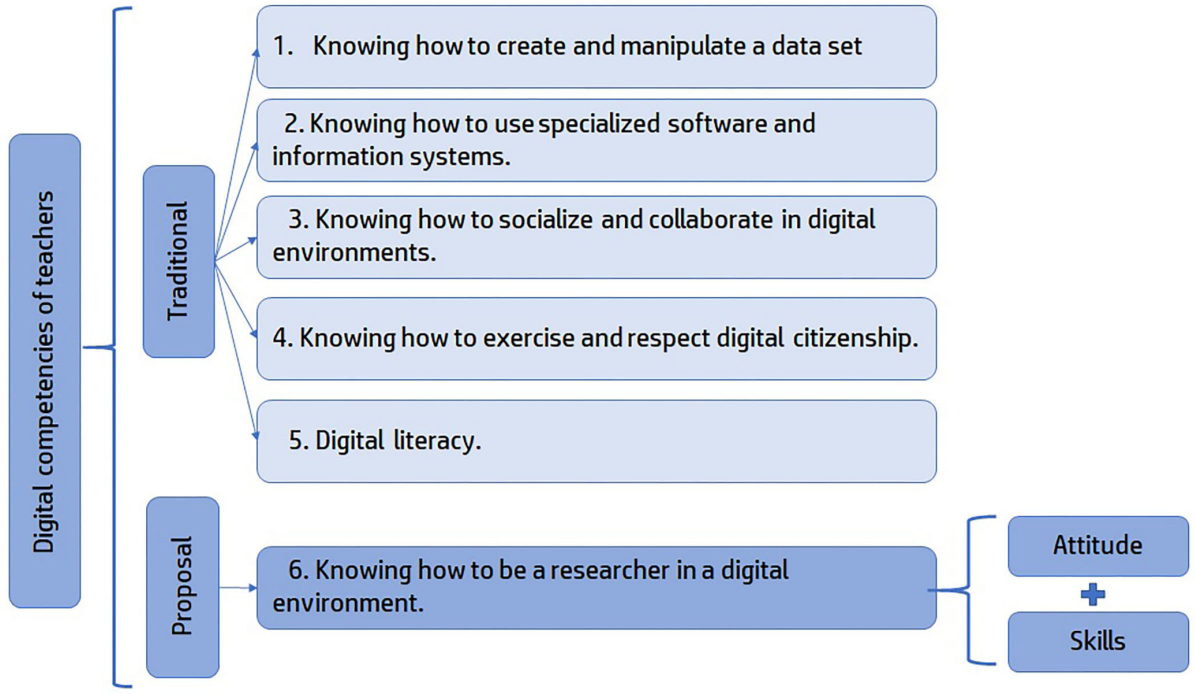

FIGURE 1
Traditional and proposed digital competencies of teachers.

extensive digital knowledge that complements research activities with information and communication technologies. In addition, to enhance digital skills and competencies, teachers must create content and use technology to teach classes (Alvarez-Flores, 2021). Based on digital citizenship, the teacher builds his or her work and the authorship of others, joining new information without plagiarism, because he or she builds knowledge from precedents, applying a research culture according to ethical principles and good practices (García Vélez et al., 2021).

The professional development of university teachers requires a pedagogical education with training in the use of different platforms and digital materials; being the responsibility of the university to reinforce the competencies and capabilities of the teacher, because experts in their area are recruited, but with limitations in pedagogy, which limit the dynamization of the student's knowledge (García Vélez et al., 2021). Likewise, the study reveals contradictions related to the self-perception and verification of the indicators of achievement of research competencies, because there is evidence of deficiencies in the competencies related to the use of information and digital tools. In addition, the described scenario indicates that universities assiduously promote training and coaching for teachers in research competencies, however, it is observed that teachers do not actively participate, even though the institutions coerce them to attend such academic events.

This current scenario confirms the lack of awareness, overvaluation and conformism of teachers, who remain in their traditional pedagogy, which prevents them from developing adequate digital research skills. It becomes a clear reason for resistance to receive adequate training in this area, since the existing results put at risk the quality of educational services, because training deficiencies continue to be transferred to new generations and it is necessary to change urgently, the paradigm of the university teacher.

In this sense, it is essential to develop critical, reflective and decisive thinking, with a drive for improvement and transcendence that should be reflected through scientific publications. The key participants of this research have the profile of researchers because they have already presented research projects or published academic books, but they do not dare to publish scientific articles in high impact journals due to digital deficiencies and language barriers. There is an urgent need for training in the use of specialized programs to improve publications and respect digital citizenship through the correct use of bibliographic managers, thus avoiding the rejection of manuscripts due to inconsistencies in citation and referencing. Digital competencies should be combined with the attitude and skills, because they will increase the quality of writing, the transparency of research and cooperative and collaborative work, and know how to be a researcher in a digital environment (Figure 1).

Limitations and future research

It is necessary to pay attention to the work of university teachers, considering the training needs in information competencies. It should be recognized that there are training deficiencies and enhance those already identified to achieve the acquisition of digital research skills.

Qualitative research captures new beliefs, has fewer limitations, is more versatile, and is more focused. It also allows researchers to speculate and insert themselves more into the research study. However, there are methodological limitations to declare.

The sample size (10 individuals) may be considered sufficient for some researchers, but not for all. We have tried to obtain as many quality records as possible, and we believe that the data collected from the 10 study subjects allowed us to understand the study phenomenon adequately.

Despite having applied the strategies of prolonged engagement and persistent observation, it is possible that there were potential biases in the responses, which would not represent 100% of the opinions and actions of the study subjects.

When calling for the study, it is possible that "self-selection bias" was unintentionally incurred, since there was no randomization in these cases. Applying randomization criteria would imply changing the process from qualitative to quantitative methods.

Due to the qualitative nature of this scientific publication, it was not possible to adequately quantify the degree of digital research competencies in the context of the study using a questionnaire. However, qualitative research allows having a deep knowledge of the observed reality, so it is accurate to obtain the university teachers' self-perception of digital research competencies, the main topic of this study.

In future research, we will investigate in depth based on "knowing how to be a researcher in a digital environment," considering another sample size, with segmentation by age, specialty, academic training and place of origin.

Data availability statement

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

Ethics statement

Ethical review and approval was not required for the study on human participants in accordance with the local legislation and institutional requirements. The patients/participants provided their written informed consent to participate in this study.

Author contributions

All authors listed have made a substantial, direct, and intellectual contribution to the work and approved it for publication.

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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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Supplementary material

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/feduc.2022.1004967/full#supplementary-material

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