Research Article

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Factors Influencing the Development of Digital Competencies in Higher Education Teachers in Latin America: A Systematic Review

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Abstract

In the present work, the objective was to perform a systematic review of the literature on the main aspects related to the factors that influence the development of digital competencies in university teachers (DTC) in Latin America, published in the last 5 years, corresponding to 2020 to 2024. The review was carried out taking into account the suggested methodological guidelines, using search strategies in different databases. Scopus, Scielo, and Web of Science. The results obtained reveal the existence of factors related to the development of the DTC, these factors are sociodemographic and institutional, with the following variables: age group, gender, length of service and institutional policies, educational management, technological infrastructure and training, respectively. It is concluded that there are sociodemographic and institutional factors that play an important role in the development of the digital competencies and that it is crucial to know them for the appropriate use of strategies aimed at promoting a digital transformation in teachers, thus improving pedagogical practices.

Keywords: *Digital teaching competencies, sociodemographic factors, institutional factors, higher education, Latin America*

1. Introduction

The digital transformation in recent decades continues to be an important issue in educational institutions, the use of information and communication technologies (ICT) has become necessary in professional profiles (Perdomo et al., 2020), in view of this, the digital teaching competence (DTC) has become in these times, one of the core competencies of the teacher of the XXI century (Alburqueque & Vicente, 2022). The DTC is formed by those capabilities, skills, and attitudes that must be developed to incorporate technologies in professional practice and development (Grimalt-Alvaro et al., 2020), which is why the recognition of the digital revolution to make changes and improvements in teaching and learning experiences through new pedagogy (Hawasly & Vargas, 2023; Maya Aracely et al.,2021); In view of this, factors that influence the development of these skills are also considered: such as generational factors that are familiar or unfamiliar with the use of digital

tools (Sarango-Lapo et al., 2020), as well as the gender perspective (Grimalt-Álvaro et al., 2020) and sociodemographic and institutional factors (Delgado Togra et al., 2022). In view of this, the personal variable in the perceptions of digital competence, academic level, and area of residence (Zhao et al., 2021) are also considered.

The digital teaching competence is defined as a set of knowledge, skills, abilities, capacities, attitudes, and strategies related to ICT that should be used to optimize student learning (Estrada Araoz et al., 2021; Zhao et al., 2021), in reference to this (OECD, 2020 p 118) adds that it is the ability to promote policies enhancing digital transformation, skills and attitudes to increase productivity. Sociodemographic factors are considered to be those characteristics related to the person, which identify different population groups (Orozco-Cazco et al., 2020; Alburqueque & Vicente, 2022) mention that a significant number of teachers have certain difficulties in integrating ICT, (Saldivia & Briceño 2020.) assume that, certain variables are present in empowerment; therefore, organizational commitment is defined as the link of individual identification; also, having the technological infrastructure and digital educational resources, by the institutions, is crucial (Hawasly & Vargas, 2023).

At the international level, several tools and training programs have been developed for educators, in the same way it is evaluated and supported to develop competencies, knowing their needs, we have the Common European Framework for Educators DC DigCompEdu, (Redecker, 2017) its objective is to provide a reference framework to develop DC models, at all levels involving the participation of governments, institutions and educational communities; the contribution of some organizations such as the (Recommendation of the European Parliament and of the Council of 18 December 2006 , on key competences for lifelong learning, 2006) recommend establishing the necessary infrastructures to adequately improve continuous training in the educational community, including teachers through procedures that have been validated and evaluated are considered. The National Institute of Educational Technologies and Teacher Training indicates that the DC is basic for our society to improve, have a high level of competence, committed and modern (Plan of Digitalization and Digital Competences of the Educational System (Plan #DigEdu), 2022), for its part UNESCO argues that a competence is more than just knowledge, teachers must have the ability to develop innovative methods, uniting technology and pedagogy by developing their skills (UNESCO ICT Competency Framework for Teachers UNESCO, 2019).

In view of this, digital competencies focus on the safe, critical, and complete use of ICT, communication, and the solution of problems that arise every day in our environment, but it is also important to consider the existence of factors that influence the development of DC, among them we have: Sociodemographic factors, such as age group, gender, employment status, years of service, and academic level, which are significantly associated with (Estrada Araoz et al., 2021; Sánchez et al., 2020; Flores-Lueg et al., 2020). Also present are the Institutional Factors, where Hawasly & Vargas (2023) highlight the importance of providing technological infrastructure, digital educational resources, trainings, and institutional support through educational policies and institutional strategies (Hawasly & Vargas, 2023). Given this, the present study will take the contribution of the primary articles to include these factors that directly influence the development of digital competencies.

Recent review studies on the DTC conducted globally, we have the contribution of Romero-Hermoza (2021) argues that the DC are a set of skills that give people to use digital tools in different environments according to their capabilities. It is also important to note that the institutional factor must have strategies to enhance digital competencies, favoring a solid and efficient digital transformation (Viñoles-Cosentino et al., 2022). In Latin America, the contribution of Perdomo et al. (2020) refers that there are studies on factors associated with digital competencies, but there is still little scientific production in these countries, and there is a need not only to increase the quantity but also the variety of designs. Similarly, Farfán & López (2022) indicate that there is little scientific production related to the subject. In a similar context, Rambay Tobar & De La Cruz Lozado (2021) refer to the need to develop a monitoring and strengthening plan for teachers who are older and have

more working time and that the use of ICTs is not evident, especially those related to planning and learning experiences in the creation of digital content. Therefore, Bueso & Parada (2023a) suggest that inadequate training is a limiting barrier to the implementation and use of ICTs in the classroom.

When analyzing the situation in different Latin American countries, it is observed that we do have reviews on digital competencies in teachers; however, little or scarce studies have been found on the factors that impact the development of these competencies; among them we have sociodemographic and institutional factors, which play an important role in the formation of innovative teachers in teaching (Viñoles Cosentino et al., 2022), Therefore, this study acquires relevance in making known the predominant variables found that should be taken into account when developing training programs and institutional policies aimed at developing digital competencies. Likewise, the appropriate and timely use of institutional strategies should be considered in order to strengthen the DCs, favoring a solid change that allows the transmission of knowledge and skills to the student (Perdomo et al., 2020; Tapia et al., 2023).

The objective of the study was to analyze the state of research articles on the sociodemographic and institutional factors that influence the development of digital competencies in higher education teachers in Latin America.

2. Methods

The scope review was developed with the purpose of having a panoramic concept of the primary studies; for this purpose a scientific literature search was performed in different databases, then inclusion and exclusion criteria were used, followed by the selection, evaluation, quality, and analysis using the procedures and recommendations of the PRISMA Declaration (Arksey & O'Malley, 2005; Grant & Booth, 2009).

2.1 Research Questions

For this review, the following question was asked:

Q1. What is the status of research articles on sociodemographic and institutional factors that influence the development of DC in higher education teachers in Latin America?

2.2 Inclusion and exclusion criteria

Inclusion criteria: a) Scientific articles on DTC in higher education; b) Scientific articles on factors influencing DTC; c) Publications in English, Spanish, and Portuguese; d) Articles developed in the university context; e) Scopus and Scielo and Wos databases; f) Period between the years 2020 and 2024.

Exclusion criteria: a) Reviews, conferences, books, letters to the editor, documentary studies, and conferences; b) Texts not available; c) Articles published before 2020; d) nonuniversity articles; e) Articles in languages other than English or Spanish; f) Non-Latin American studies; e) Incomplete articles.

2.3 Search strategy

The search strategies used consisted of the review of articles found in the following databases. Scielo, Wos, and Scopus, the searches were in June and July 2024, the keywords were: "Digital teaching competences", "Sociodemographic factors", "Institutional factors", "higher education", "Latin America"; in addition, the search with Boolean operators such as AND, OR, such as: Digital teaching competences AND Latin America, sociodemographic factors AND institutional factors, OR students, university, in addition to the inclusion and exclusion criteria.

2.4 Study selection

All the selected articles followed the inclusion and exclusion criteria, and show the selection of the 889 initial articles found according to The search terms in the different databases: Scielo, Scopus, and Wos, n=709 articles were eliminated through filters and limits such as books, book chapters, congresses or other articles that do not correspond to our study, those of restricted access and duplicates, as well as research where the key words do not appear, leaving n=63 articles to be examined. In the next stage, n=32 articles were excluded, after having read the title and abstract; we also eliminated articles that were outside our objectives, leaving a total of n = 31 articles; in this number we performed an in-depth reading where we could not recover a total of 7 articles, in addition to this we eliminated 4 articles that did not present complete texts. Finally, we were left with 20 articles selected for a critical evaluation and in-depth analysis.

2.5 Extraction and classification of relevant studies

When the selected files were stored, they were saved in an Excel file for better organization: Scielo, Wos, and Scopus databases, author, year, journal title, country, focus, design, instruments, relevant results, DOI/URL.

3. Results

In the present systematic review, information was searched in three databases: Scopus, Wos, and Scielo, using the combinations of keywords: Digital competencies in teachers* AND personal factors *, digital competencies in teachers* AND higher education* AND institutional factors, Sociodemographic factors* AND teaching digital competence*, obtaining a total of n=889 articles

Table 1. Preliminary search results in databases

Search string	**Total**			
	Scopus	Wos	Scielo	
Digital competencies in teachers AND Personal factors*.*	321	54	103	478
Digital competencies in teachers AND higher education* AND Institutional factors*.*	182	25	62	269
Sociodemographic factors AND teaching digital competence*.*	96	19	27	142
TOTAL	599	98	192	889

Own elaboration

According to Figure 1, the PRISMA flow chart shows the selection of the 889 initial articles found according to The search terms in the different databases: Scielo, Scopus, and Wos, n=709 articles were eliminated through filters and limits such as books, book chapters, congresses or other articles that do not correspond to our study, those of restricted access and duplicates, as well as research where the key words do not appear, leaving n=63 articles to be examined. In the next stage, n=32 articles were excluded, after having read the title and abstract; we also eliminated articles that were outside our objectives, leaving a total of n = 31 articles; in this number we performed an in-depth reading where we could not recover a total of 7 articles, in addition to this we eliminated 4 articles that did not present complete texts. Finally, we were left with 20 articles selected for a critical evaluation and in-depth analysis.

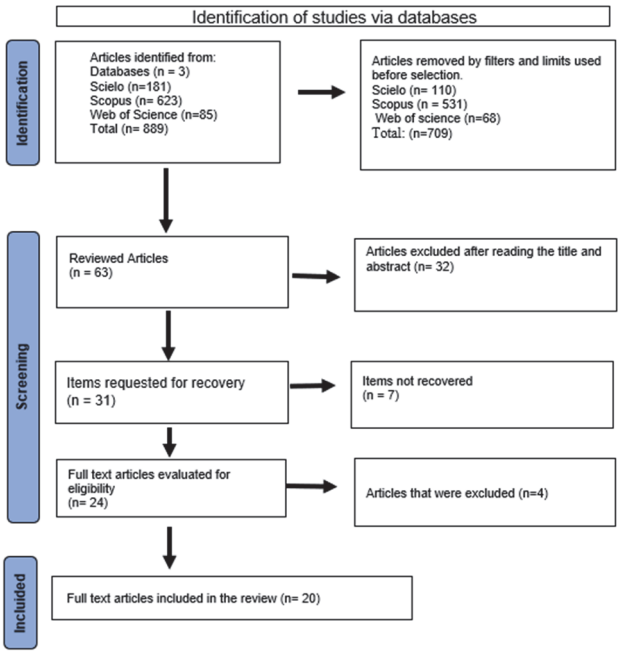

Figure 1. Systematic Review Flow Chart

Figure 2, shows the percentage of countries in Latin America with the most publications on the factors that influence DTCs. For this purpose, a scientific bibliographic search was carried out in different databases. Subsequently, inclusion and exclusion criteria were used. Next, selection, assessment, quality and analysis were carried out using the procedures and recommendations of the PRISMA Declaration, obtaining a total of n=20 articles (100%), in first place we have Ecuador n=4 (20%) and Peru with n=4 (20%), followed by Colombia n=3 (15%) and Argentina n=3 (15%), then Mexico n=2 (10%) and Chile n=2 (10%) and finally Honduras and Venezuela n=1 (5%). This number reflects the concern of researchers about the subject.

Figure 2. Countries with the highest publication in Latin America.

According to Table 2, a list of the 20 articles selected for the review is presented; We have ID, author/years, titles of their publications and countries of origin, which were used in this research work, there is no duplication of authors, and it should be noted that the primary studies that have been found. The number of publications by country is also shown: Ecuador (n = 4), Per (n = 4), Colombia (n=3), Argentina (n=3), México (n=2), Chile (n=2), Honduras y Venezuela (n=1), Ecuador and Peru being the countries with the highest number of publications.

Table 2: General characteristics of the selected studies

ID	Author/year	Article title	Country
1	(Arellano Vega, A. I., & Andrade Cázares, R. A, 2020)	Digital teaching competencies in university professors.	México
2	(Arispe-Alburqueque, C. & Yangali-Vicente, J, 2020)	Personal factors in the perception of information and communication technologies that influence digital competence in postgraduate teachers.	Peru
3	(Barrientos-Illanes et al., 2021)	Influence of perceived autonomy support, self-efficacy, and academic satisfaction on the intention of university students to remain in college.	Chile
4	(Bueso & Parada, 2023b)	Analysis of factors associated with digital competence that influence the integration of Technology in the Classroom of Teachers in Initial Training.	Honduras
5	(Cueva-Betancourt & Mosquera-Rodríguez, 2021)	Digital competencies necessary for correct teaching performance in times of pandemic in Ecuador	Ecuador
6	(Córica, 2020)	Teacher resistance to change: Characterization and strategies for an unresolved problem.	Argentina
7	(Estrada Araoz et al., 2021)	Digital Competence and Sociodemographic Variables in Peruvian Education Teachers.	Peru
8	(Flores-Lueg et al., 2020)	Personal factors influencing the self-assessment of future teachers on the pedagogical dimension of the use of ICT.	Chile
9	(Fernández et al., 2022)	Influence of administrative management on the Organizational Development of Higher Education Institutions.	Ecuador
10	(Hawasly & Vargas, 2023)	Factors influencing the development of digital competencies of rural teachers in the municipality of Montera: a cross-sectional study.	Colombia
11	(Ibañez Casas, 2023)	Sociodemographic factors associated with digital teaching competencies.	Argentina
12	(Kanobel et al., 2023)	Digital Teaching Competencies in higher education in Argentina	Argentina
13	(Limo et al., 2023)	Institutional commitment and reflective practice in teachers of educational institutions in Metropolitan Lima. 2023	Peru
14	(Luzardo Briceño et al., 2020)	Knowledge of Information and Communication Technology and How Frequent This Is Used in Education - Sociodemographic Variables of the University of the Andes Academics.	Venezuela
15	(Olivaría et al., 2022)	Factors associated with teaching practices supported by information and communication technologies.	México
16	(Orozco-Cazco et al., 2020)	Sociodemographic variables influencing the digital competencies of the university professorship.	Ecuador
17	(Paz Saavedra et al., 2022)	Teaching digital competence, attitude, and use of digital technologies by university professors	Colombia
18	(Quispe Aquise et al., 2023)	Educational Management and digital competence of Teachers in public educational institutions of Puerto Maldonado	Peru
19	(Solís Muñoz et al., 2023)	Factors associated with the innovative university teaching profile	Ecuador
20	(Torres-Flórez et al., 2022)	Digital Competencies of Professors at the Universidad de los Llanos, Colombia	Colombia

Source: The authors of this paper are elaborating on their own.

According to Table 3, the methodological characteristics and relevant results are detailed: authors, approach and design, sample and collection techniques. Most authors have developed the quantitative approach, nonexperimental design (n=14), qualitative (n=5), mixed approach (n=1). Regarding the size of the sample, a significant variability is observed, being possible to find a small sample with the participation of 20 teachers (n=20), as well as a large sample of 1.155 teachers (n=1.155), this is due to the selection criteria: random or by convenience, it will also depend on the type of research chosen by the authors and on the voluntary participation of the teachers in the

study. Regarding technique and instrument, most of the authors used the questionnaire (n=17), some also used the questionnaire and the interview (n=3).

Regarding the results of the articles found, the most salient points that were found were taken; note that there may be more than two factors that influence the development of digital competencies in teachers in the articles used. We have the **Sociodemographic Factors**, among them were found variables such as: Age group, sex, employment status, years of service, academic level, and the managerial position held by the teacher, before that a number of 8 articles have been found that refer to such variable (Table 3. ID 2,7,8,11,12,14,17 and 19); with respect to the **Institutional factors**, the variables found are: educational management, educational policies, technological infrastructure, digital educational resources, training and support; for this, 8 articles have been found that make reference (Table 3. ID 1,3,4,5,6,9,18 and 20), In addition, 4 articles have been found that mention **sociodemographic factors and institutions** (Table 3. ID 10,13,15 and 16).

Table 3. Methodological characteristics and relevant results.

ID	Author/year	Approach/design	Sample	Instrument	Results
1	(Arellano Vega, A. & Andrade Cázares, R. A., 2020)	Qualitative non-experimental	25 Teachers	Questionnaire	Teachers indicate having knowledge of basic digital skills over didactic competence with ICT and educational innovation.
2	(Arispe-Alburqueque, C. & Yangali-Vicente, J., 2020)	Quantitative/non-experimental	144 Teachers	Questionnaire	The personal factors found in the perception of digital competencies influence ICT and the programs they are taught.
3	(Barrientos-Illanes et al., 2021)	Quantitative/non-experimental	73 Teachers	Questionnaire	They indicated that academic satisfaction totally helps in the effect of teacher perception, autonomy, and academic self-efficacy.
4	(Bueso & Parada, 2023b)	Qualitative and quantitative (mixed)/ non- experimental	68 Teachers	Questionnaire and interview	They emphasize that the mastery of ICT tools, the provision of technological infrastructure, and training are the factors associated with digital competencies in teachers for the integration of technology in the classroom.
5	(Cueva-Betancourt & Mosquera-Rodríguez, 2021)	Quantitative/non-experimental	166 Teachers	Questionnaire	The results indicated the need to strengthen digital competencies in teachers so that students can take advantage of the use of technological tools in learning.
6	(Córica, 2020)	Qualitative non-experimental	46 Teachers	Questionnaire	The results obtained recommend taking political actions and strategic plans towards teachers' resistance to technological change, improving openness in educational policies.
7	(Estrada Araoz et al., 2021)	Quantitative/non-experimental	202 Teachers	Questionnaire	They indicated that digital competencies in teachers are partially developed; likewise, some variables such as age group, gender, employment status, and academic level are associated with the development of digital competencies.
8	(Flores-Lueg et al., 2020)	Quantitative/non-experimental	175 Teachers	Questionnaire	Teachers believe that they have a certain degree of knowledge about the use of ICT from a pedagogical perspective, but with a traditional approach. The personal variables found in this assessment were the teachers' age, sex, and academic level. teachers.
9	(Fernández et al., 2022)	Quantitative/non-experimental	247 Teachers	Questionnaire and interview	He argues that administrative management directly influences the organizational development of higher education institutions and that teachers value the contribution of educational policies.
10	(Hawasly & Vargas, 2023)	Qualitative non-experimental	20 Teachers	Questionnaire and interview	Access to technological infrastructure, availability of digital educational resources, training, institutional support, and collaboration among teachers are factors that influence the development of digital competencies in teachers
11	(Ibañez Casas, 2023)	Quantitative/non-experimental	82 Teachers	Questionnaire	. The sociodemographic factor is significantly associated with the development of digital competencies in teachers, among them: educational level, pedagogical area, and gender are technical dimensions that should be taken into account.
12	(Kanobel et al., 2023)	Quantitative/non-experimental	1155 Teachers	Questionnaire	It is evident that participating teachers perceive themselves as having more digital competencies than they actually possess and that there are differences in the levels of competencies achieved according to gender and academic area
13	(Limo et al., 2023)	Quantitative/non-experimental	130 Teachers	Questionnaire	teachers consider that organizational commitment is regular; it is estimated that reflective practice on digital competencies is high; which varies according to gender, age, being over 45 years old, and having more than 10 years of experience.
14	(Luzardo Briceño et al., 2020)	Qualitative non-experimental	290 Teachers	Questionnaire	They reveal that teachers with training in the scientific-technical area know better and make use of digital tools in relation to teachers of social sciences. Additionally, seniority and academic position influence the development of digital competencies.

ID	Author/year	Approach/design	Sample	Instrument	Results
15	(Olivaría et al., 2022)	Qualitative non-experimental	252 Teachers	Questionnaire	Personal variables were found to be relative between a teacher and a principal. A teacher must have digital skills and usability, and a principal must have good management because there are factors that were positively associated with teaching practices, use of technologies, and institutional support.
16	(Orozco-Cazco et al., 2020)	Quantitative/non-experimental	657 Teachers	Questionnaire	There are factors in the development of digital competencies in teachers related to age and area of knowledge. Likewise, there is a need to develop strategies and training programs considering the individual differences and needs of each teacher.
17	(Paz Saavedra et al., 2022)	Quantitative/non-experimental	162 Teachers	Questionnaire	The results found that there is a correlation between the self-perception that teachers have about their digital competencies in relation to their attitude towards technologies and the frequency of use in educational activities.
18	(Quispe Aquise et al., 2023)	Quantitative/non-experimental	200 Teachers	Questionnaire	Educational management was found to have a positive influence on the development of digital competencies in teachers, as well as the participation of managers in improving pedagogical practices with accessible programs.
19	(Solís Muñoz et al., 2023)	Quantitative/non-experimental	871 Teachers	Questionnaire	The results obtained after an analysis show that teachers have autonomy, empathy, critical thinking, creativity, and leadership within their academic profile and must be innovative regardless of gender or age.
20	(Torres-Flórez et al., 2022)	Quantitative/non-experimental	180 Teachers	Questionnaire	It was found that teachers have a medium level of knowledge of digital competencies, being low content creation. They mention the lack of implementation in the strengthening of technological tools and resources by the institutions.

Own elaboration

Table 4, presents the factors with their respective variables found in the research articles: Sociodemographic and Institutional.

Within the '**Sociodemographic**' factor, different variables have been found that influence the development of digital competencies in teachers, we have as the main variable the age group, where teachers older than 50 years have to show some resistance to the use of ICT, also, they make little use of digital technologies in teaching, similarly, it is considered, the years of service and the academic level that will influence the development of digital competencies (Table 4 ID 2. 7, 8, 11, 12, 14, 17 and 19).

Regarding the '**institutional' factor**, different variables have been found; among them it is worth mentioning that educational policies, technological infrastructure, training, and academic support, are the most prominent in the articles found (Table 4 ID 1,3,4,5,6,9,18 and 20).

Regarding **sociodemographic and institutional factors**, articles have been found that mention the importance of sociodemographic and institutional factors that affect the development of digital competencies in teachers, such as: access to infrastructure and resources, institutional training and support, organizational commitment, sociodemographic differences, specific roles and skills, and the need for personalized training strategies (Table 4 ID 10,13,15 and 16).

Table 4. Factors and variables related to DTC.

Factors	Variables	Authors IDs (table 3)
Factor: Sociodemographic.	Age group, gender, employment status, years of service, academic level and management position.	2,7,8,11,12,14, 17 y 19
Factor: Institutional	Educational management, educational policies, technological infrastructure, digital educational resources, training and support.	1,3,4,5,6,9,18 y 20
Factors: Sociodemographic and Institutional.	Age group, gender, employment status, access to infrastructure and resources, training and institutional support, organizational commitment, socio-demographic differences, specific roles and skills, and the need for customized training strategies.	10,13,15 y 16

Own elaboration

4. Discussion

In these times, it is necessary for teachers to have knowledge of the use of digital tools and digital competencies that allow them to integrate ICT in the development of learning in the classroom. The results found provide us with relevant data that should be considered when taking corrective measures by academic authorities before developing training programs for teachers (Estrada Araoz et al., 2021); (Zhao et al., 2021).

Sociodemographic factors have been found, having as variables: age, gender, academic level, work experience, management position, years of service, which will influence the development of digital competencies in teachers, as mentioned by (Orozco-Cazco et al.,2020; Moreno Guerrero et al., 2020) that there are significant differences, in relation to the age and area of knowledge of the teacher; similarly (Flores-Lueg et al., 2020; Ibañez Casas, 2023; Limo et al., 2023) affirm that the educational level, pedagogical area and gender are technical dimensions that should be taken into account, in order to identify vulnerable points in teachers, according to the needs found with the objective of improving the use of digital technological learning tools that dynamize the teaching and learning process (Estrada Araoz et al., 2021; Sánchez et al., 2020).

As for the **Institutions factors**, these play an important role in providing the necessary digital technology infrastructure that is accessible and friendly for teachers (Viñoles-Cosentino et al., 2022), within them different variables have been found, such as: Educational policies, technological infrastructure, accessibility, and above all support for teachers, thus we have (Bueso & Parada, 2023b; Barrientos-Illanes et al., 2021) argue that digital tools, the provision of technological infrastructure, and training are the factors associated with digital competencies in teachers for the integration of technologies for learning; in addition to this we have (Fernández et al, 2022) that highlights the value of an efficient administrative management in the organizational development in the institutions and that teachers value the contribution of educational policies, on the other hand, the contribution of (Torres-Flórez et al., 2022) highlights the lack of implementation of digital resources by the educational institutions that negatively impacts the motivation for the development of competencies (Limo et al., 2023).

On the other hand, it should be taken into account that teachers make use of ICT from a pedagogical perspective; within the training process alternatives should be offered, we highlight the motivation and individual learning pace of teachers as one of the main driving forces, including educational policies and institutional support being of utmost importance to promote digital competencies in teachers through support and accompaniment. (Corica, 2020).

Regarding **sociodemographic and institutional factors**, the influence on the development of digital competencies in Latin American university teachers is highlighted, these findings are supported by authors such as Cabero-Almenara and Llorente-Cejudo, (2020) and Prendes et al. (2018), as they agree to highlight the importance of technological infrastructure, training, institutional support, organizational commitment, sociodemographic differences and personalized training strategies for the development of digital competencies in teachers.

Some limitations in this study are related to the databases and search strategies used, where relevant information could have been lost, likewise, highlight the presence of some restricted access articles, being able to identify other additional factors that may affect the development of competencies in teachers. Therefore, the results and conclusions may not be definitive; we invite future researchers to expand the search for articles in other databases, to identify and prevent influential factors in the development of digital competencies in teachers.

5. Conclusion

It can be stated that there are a number of factors related to educational practices that influence the development of digital competencies in teachers, these findings allowed identifying sociodemographic and institutional factors that influence the development of these competencies,

however, these factors are accompanied by certain variables such as age, gender, academic level, years of experience and the management position held by the teacher; likewise, predominant variables such as age were found that directly affect the development and use of digital tools. Therefore, teachers to integrate digital resources into their pedagogical practices according to curricular activities and promote the access and use of technology by students.

Institutional factors also play an important role; it is worth mentioning that the variables found correspond to educational policies, technological infrastructure, and effective educational management, must be available, have accessibility, and timely training focused on the integral development of teachers and educational staff. In addition, digital educational resources, having institutional support; highlighting the idea that there is a positive disposition in wanting to develop digital competencies on the part of teachers, to assume formative processes mediated with technology.

Finally, highlight the presence of some variables within the sociodemographic factors that are significantly associated in the development of digital competencies, add the role of educational institutions fundamental; in this sense, it is suggested to strengthen digital competencies in teachers to meet the educational challenges that are increasingly demanding in this way to improve pedagogical practices. There is a need to develop strategies to implement training programs for teachers, considering the variables found, individual differences at the time of training.

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