Región Científica

e-ISSN: 2954-6168
Región Científica. 2023. 2(2), 2023119
doi: 10.58763/rc2023119

Check for updates

Teachers' digital competence for ICT skills in the 21st century: an assessment of their development

Aptitud digital del profesorado frente a las competencias TIC en el siglo XXI: una evaluación de su desarrollo

Yelenis Yanit López González[1]

ABSTRACT

Currently, the role of the teacher in education and its relationship with technological, information, and communication competencies is the subject of much attention in educational contexts. Thus, the objective of this study was to describe the results of concurrent mixed research, which evaluated the digital aptitude of teachers concerning ICT skills from a theoretical perspective established by UNESCO and the MEN. Therefore, the study was conducted with the participation of teachers of the Faculty of Economics and Administrative Sciences of the University of La Guajira, Colombia, to know how they assumed their professional development concerning the technological competencies of the XXI century. The study identifies a very moderate use of active strategies and didactics supported by ICT. Likewise, limitations are found in the classrooms regarding technological infrastructure and connectivity, which hinder the integration of ICTs in the academic and student environment.

Keywords: digital aptitude, digital literacy, ICT skills, pedagogical strategies

JEL classification: D24; O14.

RESUMEN

Actualmente, el papel del docente en la educación y su relación con las competencias tecnológicas, de información y comunicación, acapara un gran número de miradas en los contextos educativos. De esta forma, el objetivo de este estudio fue describir los resultados devenidos de una investigación mixta concurrente, que evaluó la aptitud digital del docente frente a las competencias de las TIC, desde una perspectiva teórica establecida por la UNESCO y el MEN. Por lo que, el estudio se realizó con la participación de los docentes de la Facultad de Ciencias Económicas y Administrativas de la Universidad de La Guajira, Colombia, con la pretensión de conocer cómo estos asumían su desarrollo profesional frente a las competencias tecnológicas del siglo XXI. El estudio evidencia la identificación de un uso muy moderado de estrategias y didácticas activas apoyadas mediante las TIC. Asimismo, se encuentran limitaciones en las aulas en lo relacionado con la infraestructura tecnológica y la conectividad, elementos que obstaculizan la integración de las TIC en el ámbito académico y estudiantil.

Palabras clave: aptitud digital, alfabetización digital, competencias TIC, estrategias pedagógicas

Clasificación JEL: D24; O14.

Received: 03-25-2023 **Revised:** 18-05-2023 **Accepted:** 15-06-2023 **Published:** 04-07-2023

Editor: Carlos Alberto Gómez Cano

[1]Universidad de La Guajira. Riohacha, Colombia.

Cite as: López, Y. (2023). Aptitud digital del profesorado frente a las competencias TIC en el siglo XXI: una evaluación de su desarrollo. Región Científica, 2(2), 2023119. https://doi.org/10.58763/rc2023119

INTRODUCTION

In disciplinary and academic debates in general, interest has been shown in how advances related to information and communication technologies (ICTs) have generated and continue to generate changes in all sectors and social spheres (Cerdá et al., 2021; Rodríguez et al., 2022). Likewise, the ways of relating and interacting with other human beings have been transformed, regardless of location, time, mode, or place, a fact that is revealed in supranational frameworks

Atribución No Comercial Compartir Igual 4.0 Internacional.

for educational policies (Falloon, 2020; McGarr et al., 2021). Consequently, communities have been acquiring new social structures, forming interculturality enhanced by the interconnectivity enabled by this virtual world (Cattaneo et al., 2022).

The Covid-19 pandemic, its consequences, and the efforts to stabilize the construction of new normality highlighted the relevance of ICTs, mainly in the digitalization-virtualization processes (Chen et al., 2020; Quispe et al., 2021; Scull et al., 2020). Thus, using blended learning models in the Latin American context represented a challenge and offered a space for reflection for the future (Antón et al., 2021a). Developing digital competencies is an urgent process for teachers (Inamorato et al., 2023; Monzón et al., 2023; Pozo et al., 2020). Thus, expanding the capacity for the appropriate exploitation of technologies, virtual environments, and resources not only contributes to better individual performance (Amhag et al., 2019) but also fosters dialogue with emerging generations and facilitates addressing their digital nativity (Inamorato et al., 2023).

Therefore, digital competence in teaching (DTC) is conceived as a complex configuration of knowledge, skills, and fundamental attitudes in the effective use of technology (Heine et al., 2023). This implies assuming pedagogical and didactic criteria for the correct design of technological, informational, communicative, collaborative, and ethical aspects (Gómez et al., 2022; Guillén et al., 2021), which allows for improving the teaching-learning dynamics, leaving behind the restrictions of traditional models, giving way to structures that captivate learners.

In this way, education is impacted by these technological advances, and new educational software with or without open source code, helpful to support educational processes, frequently appears. These new tools adopted in teaching and learning pose significant challenges for teachers, students, and educational institutions (IE), supported by research and innovation processes (Fernández et al., 2022; Garzón et al., 2020). Therefore, teacher professionalization must address these challenges to educate with quality, relevance, and inclusiveness (Edstrand & Sjöberg, 2023).

At the global level, the United Nations Educational and Cultural Organization (UNESCO) has formulated one of the central policies and guidelines in favor of ICT integration, where access and inclusion goals are described (Espejo et al., 2022). Similarly, the Colombian Ministry of National Education (MEN) has proposed ICT competencies for the professional development of teachers in the 21st century related to technological, communicative, pedagogical, managerial, and research competencies, all to train exploratory, integrative, and innovative teachers. Hence, higher education must transcend to renewed models in teaching (Ariza, 2021).

In this context, the University of La Guajira has invested resources in infrastructure to improve connectivity and currently has computer rooms with Internet connection. Likewise, it has developed training and updating programs for teachers in appropriating and using ICT. However, no change in the classroom impacts educational quality, which remains the same since there are very few research and educational projects that promote innovations in teaching practice.

One of the palpable results of this current state was revealed in the state tests, which show La Guajira in the last place on the Caribbean Coast in the past five years (Ariza, 2021). With indicators in generic competencies below the national average and consistent with these results, the University ranked below in the programs, both in generic and specific competencies. For the following periods, significant changes still need to be foreseen.

Other studies in Colombia show a high teacher appreciation for virtual environments but a low level of digital competence (Antón et al., 2022). Thus, at the international level, different influential factors in teaching competence are revealed, mainly in those sectors related to gender, age group, and openness to learning new resources and tools (Lucas et al., 2021). This situation is evident in students' performance and the results involving critical reading, written communication, and quantitative reasoning. Therefore, their performance is deficient in activities requiring higher-order competencies such as analysis, interpretation, and reflection.

Due to the above, knowing how teachers value their digital skills and the competencies required in this century is necessary. In this direction, it is recognized that EIs and the main agents (teachers and students) are generators of culture, which is produced and reproduced in the new educational environments supported by ICTs (González et al., 2021; Rodríguez, 2022). Therefore, revealing the positions of the strategic actors will make it possible to generate effective interventions to make up for the deficiencies.

In this sense, the study delves into the theories of learning in the computerized era and their application to teaching performance. At the same time, it seeks to update modern and contemporary concepts on pedagogy and

didactics, as well as the necessary ICT competencies by active methodologies applied and framed in the constructivist pedagogical model to which the educational project of the institution refers. In addition, it aims to describe the results of concurrent mixed research, which evaluated teachers' digital skills regarding ICT competencies in the Faculty of Economics and Administrative Sciences of the University of La Guajira, Colombia.

METHODS

The study occurred in the Faculty of Economics and Administrative Sciences (FACEYA) of the University of La Guajira, Colombia; the population consisted of 91 teachers assigned to that Faculty. Its implementation arose from the need to evaluate the digital aptitude of teachers, understood from an ICT training approach, in the technological conditions and educational policies that would allow the integration of their use and application in the curriculum, inside and outside the classroom.

The research was developed using a mixed approach, presenting a general concurrent design that allowed for simultaneous data collection and analysis (Creswell, 2009; Johnson & Christensen, 2019). Thus, the scope of the quantitative research was descriptive, non-experimental, and cross-sectional, which allowed the assessment of teachers' digital aptitude.

On the other hand, the qualitative study had a naturalistic approach. A phenomenological design was used to characterize the pedagogical strategies that supported ICT and their impact on the university classroom from the teachers' representation. It should be noted that this type of study is characterized by exploring the representation of a phenomenon by the subjects themselves, based on the study of their beliefs, attitudes, and ways of understanding it (Cuthbertson et al., 2020; Larkin et al., 2019; Purwaningrum et al., 2019).

The sample was drawn from the census of 91 FACEYA teachers who were administered a survey with structured questions in a Likert-type questionnaire 1-5, subjected to statistical analysis. In both the qualitative and quantitative studies, the sample design corresponded to 10 participants for each typology (20 total), comprised as individual units of analysis, in acceptance of the sample sizes recommended for these studies (Hernández & Mendoza, 2018). A recorded unstructured interview was applied in the form of open-ended questions to collect the data. In turn, the general concurrent mixed design contemplated two quantitative and qualitative phases, i.e., information was collected, and the results of each phase were analyzed and interpreted in parallel. The final purpose was to understand the phenomenon through the triangulation of information.

RESULTS AND DISCUSSION

Digital literacy is understood from an ICT training approach in the technological conditions and educational policies that allow integration of its use and application in the curriculum, both outside and inside the classroom. UNESCO, in terms of sustainable education, has raised the importance of capacity, preparation, and willingness to benefit from the use of available technological tools about the conditions of electricity, connectivity, and adequate infrastructure, as well as teacher training and integration of ICT into the curriculum and the educational project of the IEs (Antón et al., 2021b; Bolmsten & Manuel, 2020; Agasisti et al., 2023).

Table 1
Moments and levels of competence

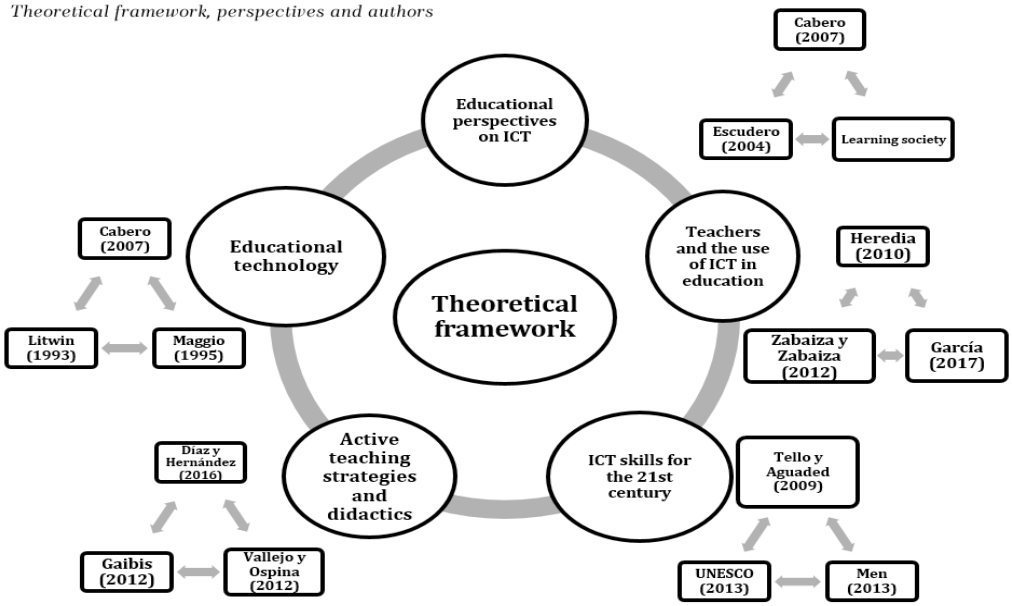
Teaching/ Competency	Technological	Pedagogical	Communicative	Research
Explorer	Knows the available technological tools and is able to introduce them in his/her professional practice.	Design strategies and methodological alternatives supported by ICTs.	Adequately exploits the possibilities offered by ICT to establish educational communication.	Uses ICT as a support for the recording and processing of the processes in which it participates.

Integrator	It handles different technological tools according to the characteristics of the processes, its area of expertise and the implementation context.	Coordinates project-based experiences that promote learning through ICT.	Promotes collaborative work in virtual environments and the formation of groups, participation in networks and community building, supported by ICT.	Designs personal research projects and promotes student participation.
Innovative	Uses ICT knowledge for the creation and maintenance of learning environments, educational innovation and context transformation.	Exercise their educational leadership in virtual environments and adopt a inclusive and personalized approach to attend to the needs of the students.	He is an active member of virtual communities, research teams and socialization of the results of experiences in the integration of ICT to educational processes.	Promotes the generation of knowledge about ICT and its proper use.

Note: Prepared by the authors based on Hernández et al. (2016).

The comparison of the reality studied and the theoretical review allowed us to base, reference, and orient the approach to stand the subject of the study. This facilitated the deepening and rigorous analysis of the results, giving meaning and scientific background to the data. Figure 1 below shows a synthesis of the results of the procedures.

Figure 1
Theoretical framework, perspectives and authors



Note: Own elaboration

By virtue of what was analyzed in each axis, the most relevant results for understanding the research process were presented, as can be seen in table 2.

Table 2.
Analysis and interpretation of quantitative data

Conditions of access to the technological infrastructure of the IE	**S**		**CS**		**AV**		**CN**		**N**		**Media**
I have access to technical resources to support training in and out of the classroom.	26	29	37	30	23	25	12	13	3	3	20.0

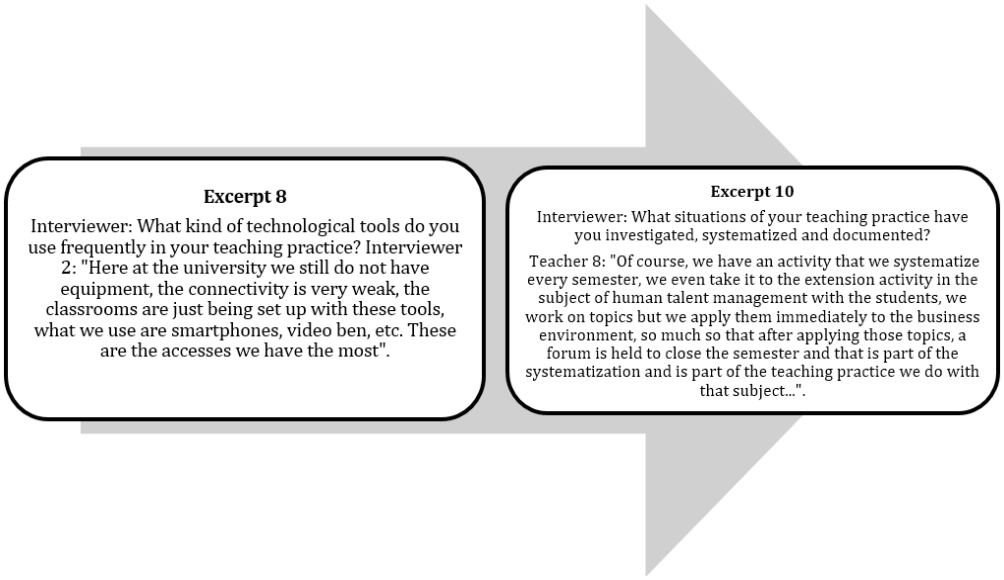
I have adequate access to broadband connectivity in and out of the classroom to support my practice.	16	18	17	19	25	28	19	21	14	15	20.2
Computer classrooms to support teaching, have well-maintained computers with connectivity, capacity per student (1/1) and adequate educational platforms.	8	9	19	21	28	31	20	22	16	17	20.0
I have sufficient access and permissions to use the institution's virtual platforms, institutional repositories and databases.	23	35	22	24	22	24	17	19	7	8	20.0
Total media											20

Source: Own elaboration

The results shown in table 2, related to digital aptitude, inferred that, despite the efforts to increase the investment of technological resources to support the academy, it still takes some time to adapt and adapt classrooms. These conditions were not considered ideal for achieving a change towards a generalized digital culture and, therefore, did not favor the intensive use and appropriation of ICTs.

Figure 2

Teaching practice category



Note: Own elaboration

According to the narratives, the conclusion of the teaching practice category in figure 2 goes in the direction of defining institutional guidelines that lead to the training of teaching staff in digital competencies and educational research. On the other hand, it is necessary to consolidate the execution of their projections regarding technological equipment and connectivity to achieve an adequate adoption and use of ICT in their daily practice, regardless of area, subject, or specialty. Regarding the triangulation of results, Hernández and Mendoza (2018) have expressed that this attempts to corroborate results, as well as to carry out cross-validations between data from both approaches, where the qualitative approach allows taking advantage of the advantages of each method and reducing its weaknesses.

Triangulation

Coincidences in the perception of the literacy level of FACEYA teachers are evident in other studies conducted in similar contexts, where they are stated as adequate or high (Antón et al., 2021b). On average, most acknowledge having adequate training and show willingness and readiness to benefit from ICTs. When interpreting the extracts of the category significant appropriation of technologies, teachers express the importance and strength of digital environments. They will assume the changes according to the conditions for adequate pedagogical use. This suggests divergences between the actual state of digital competence and the teachers' perception of it, which suggests the need to review standards, educational policies, and teaching practices.

In this regard, comparing digital tools' capacity, knowledge, and disposition in the classroom does not let them be corroborated with these results. This is because the respondents demonstrate a very moderate use of strategies and didactics supported by ICT. These results were divergent in both studies of the mixed design since the questionnaire shows a low level of implementation according to the MEN indicators; thus, the qualitative study suggests a social representation that points to a high perception. In this sense, the interviewees reaffirm the use of these digital resources through active pedagogy, which leads to infer that they are teachers with high-level training and who support graduate programs, which implies these purposes, in line with the results found in the literature, mainly in the studies conducted by authors such as Antón et al. (2021a, 2021b, 2022).

As for divergence, this has been diagnosed in other studies, such as the one conducted by Okoye et al. (2023), who emphasize the lack or inadequacy of training, difficulties in infrastructure and availability of resources, access to the Internet and other digital platforms, as the main challenges for the teaching-learning process mediated by ICTs. This constitutes a critical barrier and is, to a large extent, an expression of the reproduction of analogical educational models. In the Latin American context, this difficulty has been evaluated in several studies, which suggests a double conditioning established by the economic and cultural difficulties of the region, as well as the inadequate perception of the importance of ICTs.

In this aspect, there are similarities between what the teachers narrated and what the respondents showed. Thus, the results of both studies coincide in that the limitations are found in classrooms, technological infrastructure, and connectivity, factors that hinder the integration of ICTs in the educational sense. In this sense, the current state is conceived as far from UNESCO's proposals on technological equipment in university classrooms and the prospects for immediate implementation in higher education.

In short, it is reiterated that, according to the ICT competencies approach defined by the MEN (2013), teachers are at a level of exploration or low complexity to assume digital appropriation. This implies accepting the difficulties of transcending the integration stage and the shortcomings in the training and performance of the innovative teacher of these processes in the classroom. This aspiration requires an institution-wide strategy incorporating technological, communication, pedagogical, management, and research dimensions to achieve digital transformation (Cerdá et al., 2021).

In turn, comparing data and information related to educational projects generated from classroom experiences allows for corroboration. It proves that teachers need an accurate perception of what it means to be competent in using ICTs. The main difficulties are researching their practices, using big data, documenting experiences, and proposing research projects (Antón et al., 2021a). Therefore, the importance of educational research and innovation to promote the changes required by EI is highlighted; however, efforts are still needed to promote the development of this topic (Burgos & Branch, 2021).

CONCLUSIONS

The irruption of ICTs in higher education is not a casual or temporary phenomenon; it manifests in a digital era redesigning traditional teaching paradigms. At the same time, technology offers powerful tools to transform education; more than just implementing these tools, they are needed to optimize educational processes. Instead, the synergy between technological capabilities and pedagogical methodologies can bring about significant change.

The role of the teacher in this scenario changes significantly. Beyond being a simple transmitter of knowledge, the teacher becomes a mediator and facilitator of learning, using technology to adapt and personalize education according to the needs of each student. Their ability to lead and guide this change is crucial for the integration of ICT to be truly effective and transformative.

However, as has been pointed out, there is evident reluctance and difficulties in developing Digital Teaching Competence (DTC). Although educators may be familiar with concepts of active pedagogy, they only sometimes manage to effectively translate these methodologies to the digital environment. This gap between theory and practice underscores the need to provide teachers with ongoing training and support in digital didactics to take full advantage of the opportunities provided by ICTs.

Finally, CDD should not be seen as an isolated or exclusive teacher skill but as an institutional competency. Effective ICT integration requires a shared vision, where the entire educational community -including teachers, students, administrators, and managers- work together to redefine and improve educational processes. In this sense,

it is essential to foster a culture of collaboration and continuous learning in which all actors actively participate in constructing and improving educational projects in the digital era.

REFERENCES

Agasisti, T., Antequera, G. y Delprato, M. (2023). Technological resources, ICT use and schools efficiency in Latin America – Insights from OECD PISA 2018. *International Journal of Educational Development*, 99, 102757. https://doi.org/10.1016/j.ijedudev.2023.102757

Amhag, L., Hellström, L. y Stigmar, M. (2019). Teacher Educators' Use of Digital Tools and Needs for Digital Competence in Higher Education. *Journal of Digital Learning in Teacher Education*, 35(4), 203-220. https://doi.org/10.1080/21532974.2019.1646169

Antón, Á., Vergara, D. y Fernández, P. (2021a). Self-Assessment of Soft Skills of University Teachers from Countries with a Low Level of Digital Competence. *Electronics*, 10(20), 2532. https://doi.org/10.3390/electronics10202532

Antón, Á., Vergara, D., Fernández, P. y Ariza, E. (2022). Didactic Use of Virtual Reality in Colombian Universities: Professors' Perspective. *Multimodal Technologies and Interaction*, 6(5), 38. https://doi.org/10.3390/mti6050038

Antón, Á., Vergara, D., Lamas, V. y Fernández, P. (2021b). Digital Content Creation Tools: American University Teachers' Perception. *Applied Sciences*, 11(24), 11649. https://doi.org/10.3390/app112411649

Ariza, W. (2021). La falla de implementación de la política pública de permanencia y graduación universitaria en Colombia: Los casos de la Universidad de Cartagena y la Guajira en la Costa Caribe. [Tesis de Maestría, FLACSO]. https://acortar.link/w1F2Gj

Bolmsten, J. y Manuel, M. (2020). Sustainable participatory processes of education technology development. *Educational Technology Research and Development*, 68, 2705-2728. https://doi.org/10.1007/s11423-020-09803-3

Burgos, D. y Branch, J. (2021*). Radical Solutions for Digital Transformation in Latin American Universities: Radical Solutions for Digital Transformation in Latin American Universities*. Springer. https://doi.org/10.1007/978-981-16-3941-8

Cattaneo, A., Antonietti, C. y Rauseo, M. (2022). How digitalised are vocational teachers? Assessing digital competence in vocational education and looking at its underlying factors. *Computers & Education*, 176, 104358. https://doi.org/10.1016/j.compedu.2021.104358

Cerdá, L., Núñez, K. y Quirós, S. (2021). A Systemic Perspective for Understanding Digital Transformation in Higher Education: Overview and Subregional Context in Latin America as Evidence. *Sustainability*, 13(23), 12956. https://doi.org/10.3390/su132312956

Chen, T., Peng, L., Yin, X., Rong, J., Yang, J. y Cong, G. (2020). Analysis of User Satisfaction with Online Education Platforms in China during the COVID-19 Pandemic. *Healthcare*, 8(3), 200. https://doi.org/10.3390/healthcare8030200

Creswell, J. (2009). *Research design: Qualitative, Quantitative and mixed approaches (3rd Ausg.)*. Sage. https://doi.org/10.2307/1523157

Cuthbertson, L., Robb, Y. y Blair, S. (2020). Theory and application of research principles and philosophical underpinning for a study utilising interpretative phenomenological analysis. *Radiography*, 26(2), e94-e102. https://doi.org/10.1016/j.radi.2019.11.092

Edstrand, E. y Sjöberg, J. (2023). Professional digital competence (PDC) in teacher education – teacher candidates reasoning about programming when involved in problem-solving activities with digital tools. *Journal of Digital Learning in Teacher Education*, 39(2), 1-13. https://doi.org/10.1080/21532974.2023.2210317

Espejo, L., Herrero, L. y Álvarez, G. (2022). UNESCO Strategy and Digital Policies for Teacher Training: The Deconstruction of Innovation in Spain. *Journal of New Approaches in Educational Research*, 11(1). https://doi.org/10.7821/naer.2022.1.812

Falloon, G. (2020). From digital literacy to digital competence: the teacher digital competency (TDC) framework. *Educational Technology Research and Development*, 68, 2449-2472. https://doi.org/10.1007/s11423-020-09767-4

Fernández, J., Montenegro, M., Fernández, J. y García, I. (2022). Digital competences for teacher professional development. Systematic review. *European Journal of Teacher Education*, 45(4), 513-531. https://doi.org/10.1080/02619768.2020.1827389

Garzón, E., Sola, T., Ortega, J., Marín, J. y Gómez, G. (2020). Teacher Training in Lifelong Learning—The Importance of Digital Competence in the Encouragement of Teaching Innovation. *Sustainability*, 12(7), 2852. https://doi.org/10.3390/su12072852

Gómez, V., Matarranz, M., Casado, L. y Otto, A. (2022). Teachers' digital competencies in higher education: a systematic literature review. *International Journal of Educational Technology in Higher Education*, 19, 8. https://doi.org/10.1186/s41239-021-00312-8

González, S., López, A. y Cardenal, M. (2021). Digital inequality at home. The school as compensatory agent. *Computers & Education*, 168, 104195. https://doi.org/10.1016/j.compedu.2021.104195

Guillén, F., Mayorga, M., Bravo, J. y Escribano, D. (2021). Analysis of Teachers' Pedagogical Digital Competence: Identification of Factors Predicting Their Acquisition. *Technology, Knowledge and Learning*, 26, 481-498. https://doi.org/10.1007/s10758-019-09432-7

Heine, S., Krepf, M. y König, J. (2023). Digital resources as an aspect of teacher professional digital competence: One term, different definitions – a systematic review. *Education and Information Technologies*, 28, 3711-3738. https://doi.org/10.1007/s10639-022-11321-z

Hernández, C., Arévalo, M. y Gamboa, A. (2016). Competencias TIC para el desarrollo profesional docente en educación básica. *Praxis & Saber*, 7(14), 41-69. http://dx.doi.org/10.19053/22160159.5217

Hernández, R. y Mendoza, C. (2018). *Metodología de la Investigación: Las rutas cuantitativa, cualitativa y mixta (1ra Ausg.)*. McGraw-Hill Interamericana.

Inamorato, A., Chinkes, E., Carvalho, M., Solórzano, C. y Marroni, L. (2023). The digital competence of academics in higher education: ¿is the glass half empty or half full? *International Journal of Educational Technology in Higher Education*, 20(1), 9. https://doi.org/10.1186/s41239-022-00376-0

Johnson, R. y Christensen, L. (2019). *Educational research: Quantitative, qualitative, and mixed approaches*. Sage Publications.

Larkin, M., Shaw, R. y Flowers, P. (2019). Multiperspectival designs and processes in interpretative phenomenological analysis research. *Qualitative Research in Psychology*, 16(2), 182-198. https://doi.org/10.1080/14780887.2018.1540655

Lucas, M., Bem, P., Siddiq, F., Moreira, A. y Redecker, C. (2021). The relation between in-service teachers' digital competence and personal and contextual factors: What matters most? *Computers & Education*, 160, 104052. https://doi.org/10.1016/j.compedu.2020.104052

McGarr, O., Mifsud, L. y Colomer, J. (2021). Digital competence in teacher education: comparing national policies in Norway, Ireland and Spain. *Learning, Media and Technology*, 46(4), 483-497. https://doi.org/10.1080/17439884.2021.1913182

Monzón, L., Dávila, J., Rodríguez, E. y Pérez, A. (2023). La resiliencia en el contexto universitario, un estudio mixto exploratorio. *Pensamiento Americano*, 16(31), 1–15. https://doi.org/10.21803/penamer.16.31.636

Okoye, K., Hussein, H., Arrona, A., Quintero, H., Peña, L., Lopez, A., Arias, E, Escamilla, H. y Hosseini, S. (2023). Impact of digital technologies upon teaching and learning in higher education in Latin America: an outlook on the reach, barriers, and bottlenecks. *Education and Information Technologies*, 28, 2291–2360. https://doi.org/10.1007/s10639-022-11214-1

Pozo, S., López, J., Rodríguez, A. y López, J. (2020). Teachers' digital competence in using and analytically managing information in flipped learning. *Culture and Education*, 32(2), 213-241. https://doi.org/10.1080/11356405.2020.1741876

Purwaningrum, R., Hanurawan, F., Degeng, I. y Triyono. (2019). School counselor's psychological well-being: a phenomenological study. *European Journal of Education Studies*, 6(2), 80-99. https://doi.org/http://dx.doi.org/10.5281/zenodo.2691173

Quispe, S., Cavalcanti, M., Caipa, M., Paucar, A. y Rojas, H. (2021). A Systemic Framework to Evaluate Student Satisfaction in Latin American Universities under the COVID-19 Pandemic. *Systems*, 9(1), 15. https://doi.org/10.3390/systems9010015

Rodríguez, E., Gómez, C. y Sánchez, V. (2022). Management information systems and their impact on business decision making. *Data and Metadata*, 1, 21. https://doi.org/10.56294/dm202221

Scull, J., Phillips, M., Sharma, U. y Garnier, K. (2020). Innovations in teacher education at the time of COVID19: an Australian perspective. *Journal of Education for Teaching, 46*(4), 497-506. https://doi.org/10.1080/02607476.2020.1802701

FINANCING
No external financing.

DECLARATION OF CONFLICT OF INTEREST
None.

AUTHORSHIP CONTRIBUTION
Conceptualization: Yelenis Yanit López González.
Formal analysis: Yelenis Yanit López González.
Research: Yelenis Yanit López González.
Methodology: Yelenis Yanit López González.
Software: Yelenis Yanit López González.
Writing - original draft: Yelenis Yanit López González.
Writing - proofreading and editing: Yelenis Yanit López González.