Digital Competencies For Hybrid Classroom Teaching In Latin American Universities: Systematic Review

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Abstract

The use of information and communication technologies has revolutionized the educational field, where the use of digital strategies and skills are essential for the teaching of classes. The objective of this research responds to the analysis of digital competencies for teaching in hybrid classes in Latin American universities. This study has a qualitative approach, of a basic descriptive type; Scopus was used to search for information, in addition, for accuracy, inclusion and exclusion criteria were applied, then 15 sources were considered; concluding that digital competencies are important in the teaching of hybrid classes.

Keywords: Digital competencies, hybrid classes, teachers, universities, ICT.

Resumen

El uso de las tecnologías de la información y comunicación ha revolucionado el campo educativo, donde el uso de estrategias y competencias digitales son imprescindibles para el dictado de clases. El objetivo de esta investigación responde al análisis de las competencias digitales para la enseñanza en clases híbridas en las universidades de Latinoamérica. Este estudio es de enfoque cualitativo, de tipo básico descriptivo; para la búsqueda de información se utilizó Scopus, además, por precisión, se aplicaron criterios de inclusión y exclusión, posteriormente se consideró 15 fuentes; concluyendo que las competencias digitales son importantes en el dictado de clases híbridas.

Palabras clave: Competencias digitales, clases híbridas, docentes, universidades, TIC.

1. INTRODUCTION

As a result of the COVID 19 pandemic, information and communication technologies (ICT) have been a great impetus to continue teaching at a distance. However, it is important to mention that many of the teachers were not digital natives, so it was difficult for them to carry out their work, having to break their paradigms in order to do so. The use of technologies made it necessary to redefine job profiles and, therefore, professional training, within this framework, university teachers play a key role, so that educational institutions must ensure the development of the digital skills necessary to support the training of future professionals (Tapia et al., 2022).

In this context, Perea and Abello (2022) consider that digital competencies are a set of techniques, skills and abilities necessary to respond to the demands of teaching and with special attention to the teaching-learning process. These skills allow obtaining and processing information starting from the use of information technologies to transform them into knowledge.

Likewise, Ruíz-Ramírez et al., (2020) consider that digital competencies should be understood as a group of tools to manage classes; the application of ICT, the organization and management of university students, the Internet, the use of basic tools such as Zoom, Teams, Meet, for videoconferencing; or the use of Kahoot,

Mentimeter, Socrative, among others to be able to encourage students with more innovative strategies.

In this sense, Araiza and Pedraza, (2019) express that one of the great strengths of information and communication technologies lies in the development of digital competencies, given that teachers can introduce the use of technologies in their classes in order to stimulate students to develop their own competencies and understand that ICTs are applicable to each of the areas of knowledge.

Similarly, Tejada and Pozos (2018) argue that digital competence provides the possibility of taking advantage of technological resources to teach interactive and more interesting classes to the student's eye, given that in traditional teaching learning is usually a bit tedious. These competencies are increasingly necessary to participate constantly in the new knowledge society. Being able to incorporate these digital skills such as didactic tools that allow students to establish an interest in the subject is important to provide quality teaching.

Digital competencies refer to the training of teachers regarding the use of information technologies in more advanced areas than the simple handling of tools; to achieve an excellent teaching-learning process it is necessary that these digital competencies are mastered by both teachers and students so that they can adapt and develop in new learning environments that can be one hundred percent virtual, hybrid classes, among other modalities. (Cabero-Almenara et al, 2021).

The use of technological tools is essential when we talk about virtual classes, since they help students and teachers to have a clearer idea of the subjects they visualize in their virtual environments, and they also help new generations to develop in these environments, creating, knowing, transforming information, among others. Involving these digital competencies in the teaching of classes allows overcoming the gaps that exist since there are too many tools to know and manage (Burgos-Videla et al., 2021).

Today's education needs teachers trained in the use of information technologies; the teacher is a learning facilitator who must make available to the student a large amount of educational content to function as a motivating agent in the teaching-learning process. The efficient use of digital competencies benefits in a positive way both the teacher and the student, in the case of the latter, it will facilitate the understanding of topics, he/she will be able to become literate in terms of digital and audiovisual tools, will encourage student autonomy, will be able to collaborate as a team, will be able to

develop better critical thinking, and in general will allow teachers to make teaching more flexible (Zárate et al., 2020).

Dueñas et al, (2022) consider that digital competencies require a variety of capabilities, skills and practical attitudes for the use of tools available for the teaching-learning process. The use of these competencies should be a basic knowledge for teachers since they will have to teach their classes forming students who will be professionals in a future society that will be increasingly digital.

Now, with emphasis on the current year, thanks to the provisions of the state, universities are considering a return to face-to-face classes, but with a change: hybrid classes, where some classes can be taught on campus and remotely in virtual environments with the help of the various platforms already known.

1.1 Hybrid classes in universities

Honeycutt and Sears (2020) define the hybrid classroom model as a blended learning program, where the student performs part of their learning remotely, gaining control over time, space and pace of their activities, and at the same time in a face-to-face manner with the supervision of a teacher. Likewise, the authors mention that the hybrid teaching model is not a methodology but a way by which education is intended to be imparted, in most cases this type of teaching is given in careers that by their nature require face-to-face classes, such as engineering, health, architecture, since it requires a lot of practice. Currently, hybrid classes are increasingly present in different universities, due to the pandemic, many institutions opted for this type of teaching momentarily until face-to-face classes return to normal.

For Youhasan et al, (2022) hybrid education is an alternative teaching method that arises thanks to technological progress, this is a relatively new concept and has much to do with the use of digital tools, this method is based on the development of virtual and face-to-face classes, which aims to solve problems of time and distance for people who have difficulty attending daily to their study center for various reasons.

Likewise, Divjak et al (2022) argue that hybrid classes are those teaching and learning activities that are provided simultaneously, aimed at a group of students attending virtually and face-to-face. In the last decade this type of teaching has received special attention, since it turns traditional learning strategies upside down, i.e. the component that transmits the information in a face-to-face class moves to new teaching methods thanks to technology with the use of didactic materials that help the student to better assimilate the

information and retain what they have learned. This technology-based learning strategy and the use of digital tools were predominant during the covid-19 pandemic.

In addition, Khodaei et al (2022) mentions that hybrid classes is a synchronous teaching-learning modality, in which classes are taught with students in a face-to-face and virtual way at the same time. In recent times, blended classes are becoming increasingly relevant in university environments, this method has different stages, one of them is the consolidation of new technologies that adapt to a new mode and are appropriate for optimal student learning, in turn it is important a proper training of the teaching staff so that they can make use of new technologies normally. Likewise, this type of teaching brings good results, since students develop skills, self-learning, problem-solving skills and critical thinking. At the same time, they have more opportunities to participate and interact with the teacher, since they have sufficient material and have quick and safe access to the resources offered.

2. METHODOLOGY

The methodology used for the elaboration of this research responds to an approach aimed at the systematic review of the literature, this study is of a qualitative approach, of a basic descriptive type; for the search of information the Scopus database was used, from which scientific articles presented in this review were extracted, which allows establishing search criteria on digital competences for teaching in hybrid classes in universities.

This research was based on the PRISMA method (Garcés et al., 2019), this method is a guide for authors who prepare systematic review articles. For the search strategy, the Scopus database was used as the main source to obtain information on articles related to the variables of this research. In this sense, a primary search was performed with the following study variables:

Digital skills AND hybrid classes, digital skills AND distance education, digital skills AND higher education, digital skills AND virtuality, digital skills AND flipped classrooms, digital skills AND blended classes, digital skills AND flipped classroom, digital skills AND blended classes, flipped classroom and blended learning. In this search we found important articles in both Spanish and English.

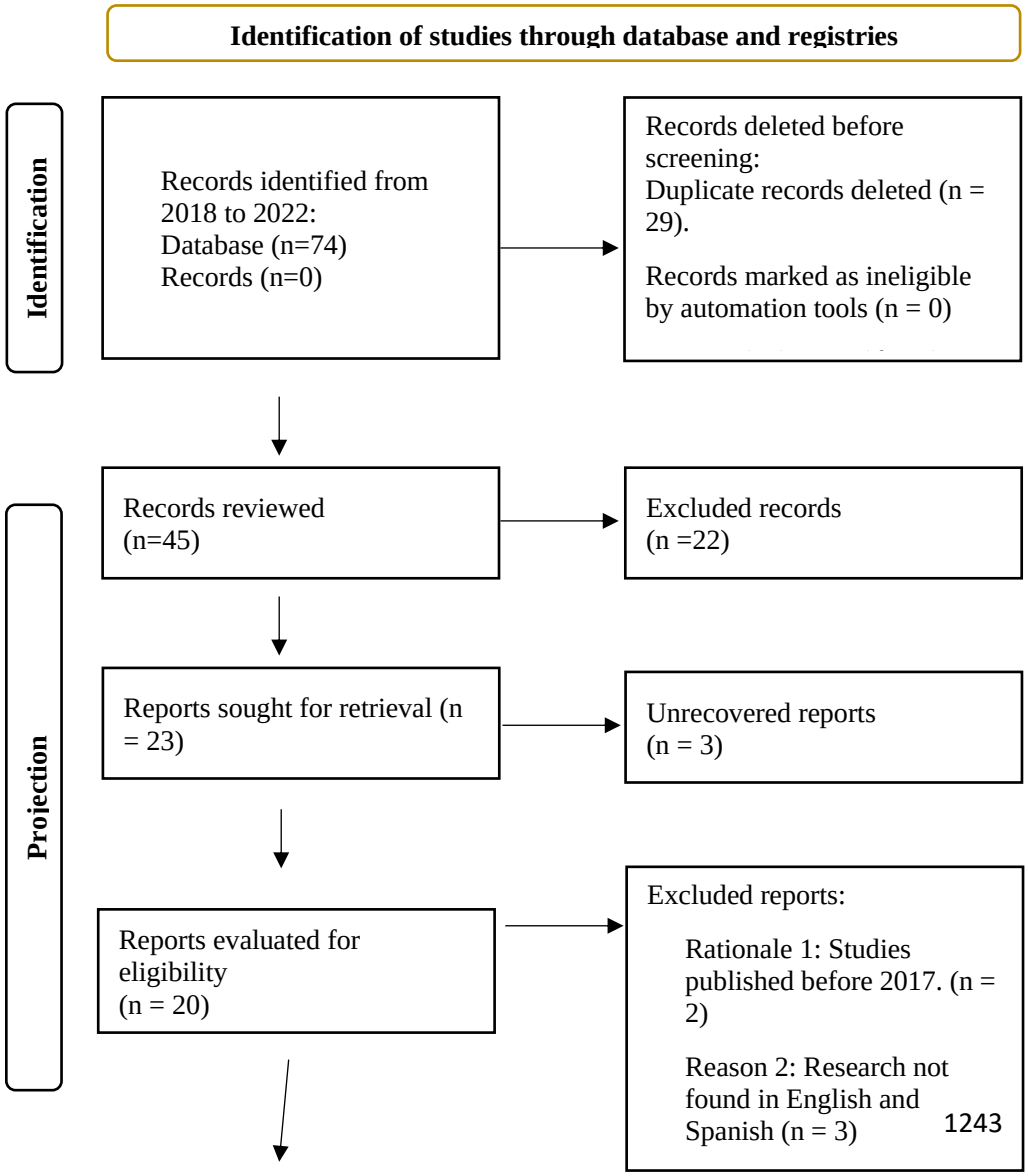
Regarding the inclusion criteria, articles published between 2018 and 2022 were considered, in Spanish or English, with university teachers and students from different countries of the world as population and sample, with emphasis on Latin America.

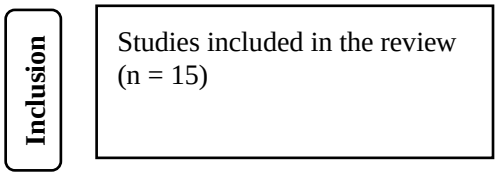
In the same way, for the exclusion criteria, publications prior to the years mentioned above (2018-2022) were considered, in addition, articles that were in a language other than Spanish or English were excluded; those researches that did not have free access were excluded, neither were articles that did not present similarities in the keywords, title of the text, however, if within the article something important for the research is mentioned, it will be used.

After the search for information, 74 research studies were found that were related to the variables of this work, which had to pass through a filter to obtain the most important studies, leaving 15. For data extraction, 15 research studies were used, each study was read, analyzed from beginning to end and each of the contributions of the researchers were reviewed to use concepts, conclusions and/or results necessary for this systematic review.

The following is the PRIMA 2020 flowchart - for new systematic reviews that include databases (Garcés et al., 2019) (Table 1).

TABLE 1 PRISMA 2020 flow chart





Source: Adaptation by the researchers.

2.1 Selected sources

The 15 articles selected for this systematic review are shown in this table.

TABLE 2 List of items selected for review after applying the filter.

N°	Authors and year	Title	Magazine
1	Tapia, Z., Panduro, J., Tejada, A., Fuster-Guillen, D. and Uribe-Hernandez. Y. (2022)	Didactic strategies and digital competencies in the teaching practice of teachers with remote work in Lima-2021.	Iberian Journal of Information Systems and Technologies.
	Tejada, J. and Pozos, K. (2018).	New scenarios and digital teaching competencies: Towards teacher professionalization with ICT.	Faculty.
	Cabero-Almenara, J., Barroso-Osuna, J., Palacios-Rodríguez, A. and Llorente-Cejudo, C. (2021).	Evaluation of university t-MOOC on teaching digital competences through expert judgment according to the DigCompEdu Framework.	Journal of Distance Education.
	Burgos-Videla, C., Rojas, W., Meneses, E. and Martínez, J. (2021).	Digital competence analysis of university students using latent classes.	Education Sciences.
5	Wang, X., Wang, Z., Wang, Q., Chen, W. and Pi, Z. (2021).	Supporting digitally enhanced learning through measurement in higher education: Development and validation of a university students' digital competence scale.	Journal of Computer Assisted Learning.
	Ruíz-Ramírez, J., Tamayo-Preval, D. and Montiel-Cabello, H. (2020).	Digital competencies of teachers in the online classroom modality: case study in the context of health crisis.	Texto Livre.
	Zarate, A., Gurieva, N. and Jimenez, V. (2020).	The holistic practice of digital teaching skills: diagnosis and prospective.	Educational Thinking.
	Cobero, J. and Martinez A. (2019).	Information and Communication Technologies and initial teacher training. Digital models and competences.	Faculty.

	Araiza, M. and Pedraza, E. (2019).	Discernment of teachers by gender in the use of ICT in the classroom based on digital competencies.	Spaces.
	Dueñas, J., Huamani, I. and Sáenz, M. (2022)	Learning to Learn: Learning theory associated with the mastery of digital competencies in university students.	Revista de Filosofía.
	Spada, I., Chiarello, F., Barandoni, S., Ruggi, G., Martini, A. and Fantoni, G. (2022).	Are universities ready to deliver digital skills and competences? A text mining-based case study of marketing courses in Italy	Technological Forecasting and Social Change.
	Honeycutt, L. and Sears, E. (2020).	Teaching Spanish in the United States in the digital age: Strategies and approaches on teaching Spanish in online and hybrid classes	Bellaterra Journal of Teaching and Learning Language and Literature
	Mousumi, R. and Manish, R. (2022).	Are the Technological Tools used in Virtual and Hybrid Classrooms Still Useful in a Fully In-Person Setting? An Assessment of the Effectiveness of the Technological Tools in Enhancing the Pedagogy in the New Normal.	ASEE Annual Conference and Exposition, Conference Proceedings.
	Divjak, B., Rienties, B., Iniesto, F., Vondra, P. and Žižak, M. (2022).	Flipped classrooms in higher education during the COVID-19 pandemic: findings and future research recommendations.	International Journal of Educational Technology in Higher Education.
	Guzman-Cole, C. and García-Ojeda, M. (2022).	An Upper-Division, Remote Microbiology Laboratory That Blends Virtualand Hands-on Components to Promote Student Success duringthe COVID-19 Pandemic.	Journal of Microbiology and Biology Education.

Source: Own elaboration.

Table 2 shows that research in English predominates, but not by much; if we emphasize the titles, we can see that all the articles have at least one of the variables to be investigated, which makes them relevant and important for the continuity of this study.

3. RESULTS

As mentioned above, 15 articles were selected, which were analyzed and the most interesting results and/or conclusions were extracted and shown in the following table (Table 3).

TABLE 3 Results and/or Conclusions drawn from the selected research.

N°	Title	Results and/or conclusions
1	Didactic strategies and digital competencies in the teaching practice of teachers with remote work in Lima-2021.	Didactic strategies and digital competencies have an impact on the teaching practice of teachers working remotely in Lima. They also recommend that teachers participate in training processes to update and acquire these competencies.
	New scenarios and digital teaching competencies: Towards teacher professionalization with ICT.	The authors consider that teachers should acquire digital competencies since the current professional scenario requires it. Teachers professionally trained in ICT are needed to meet the demands of the current university market.
	Evaluation of university t-MOOC on teaching digital competences through expert judgment according to the DigCompEdu Framework.	The authors conclude that it is important for teachers to be able to address a training plan in terms of digital competencies following the guidelines of the institutions.
	Digital competence analysis of university students using latent classes.	Universities should consider various ways to develop roles for the new professionals that are required in society. New educational perspectives are being given through new technological advances and discoveries that require a greater focus for teaching-learning processes, where digital competence is considered to be one of the key skill sets of this century.
5	Supporting digitally enhanced learning through measurement in higher education: Development and validation of a university students' digital competence scale.	The DC-US allows instructors and administrators to conveniently obtain preliminary information about college students' digital proficiency, informing their digital classroom preparation and the development of timely interventions to address digital deficiencies.
	Digital competencies of teachers in the online classroom modality: case study in the context of health crisis.	The authors argue that well-implemented digital educational resources have great potential to transform and build a new educational future, both face-to-face and non-face-to-face.
	The holistic practice of digital teaching skills: diagnosis and prospective.	The education of the present century requires professionals trained in the use of ICT, they must acquire skills that without them will not be able to develop the educational act effectively, therefore, digital skills for teaching appear as a necessity for teachers, since it will allow them to design, produce, manage and circulate a large amount of information in an agile and effective way.

	Information and Communication Technologies and initial teacher training. Digital models and competences.	Teacher training in ICT is fundamental, given the educational context in which we live, however, this process must be gradual, emphasizing periodic updating for the best use of the resources available to them.
	Discernment of teachers by gender in the use of ICT in the classroom based on digital competencies.	For the current teaching processes it is an indispensable requirement that higher education teachers develop digital competencies and make use of ICT applied to teaching in order to contribute to the training of students so that they are able to compete under the requirements of the knowledge society and not be excluded.
	Learning to Learn: Learning theory associated with the mastery of digital competencies in university students.	Digital competencies are one of the factors that students need to learn in this era where technology, information and knowledge have modified the axiological and behavioral qualities of individuals and society. Learning is not synonymous with the accumulation of knowledge; it requires a set of skills that allow continuous training, whose horizon is the expansion of knowledge, effective professional practice and positive social impact.
	Are universities ready to deliver digital skills and competences? A text mining-based case study of marketing courses in Italy	They believe that education systems must update their training programs to meet the emerging needs of today's market. It is crucial to support the transformation of education and constant training in digital competencies in order to provide quality remote or face-to-face classes.
	Teaching Spanish in the United States in the digital age: Strategies and approaches on teaching Spanish in online and hybrid classes	The authors state that hybrid classrooms are a good option to offer quality teaching, and can also benefit from technological advances and digital skills to create a more interactive space.
	Are the Technological Tools used in Virtual and Hybrid Classrooms Still Useful in a Fully In-Person Setting? An Assessment of the Effectiveness of the Technological Tools in Enhancing the Pedagogy in the New Normal.	Most of the digital tools were found to be effective in engaging students in both remote and hybrid environments and also offers a positive learning experience.

	Flipped classrooms in higher education during the COVID-19 pandemic: findings and future research recommendations.	The study found that those institutions that had used flipped classroom approaches in face-to-face or blended learning environments more successfully continued to use them in online environments than those that had not. This is a great achievement given the new face-to-face arrangements, which with the help of teachers' digital competencies can increase the quality of the service to be provided.
	An Upper-Division, Remote Microbiology Laboratory That Blends Virtualand Hands-on Components to Promote Student Success duringthe COVID-19 Pandemic.	The authors argue that thanks to the adaptation of a laboratory course to the online learning environment, they understood that they must be flexible in all aspects of their teaching. They also consider that thanks to virtual environments and digital competencies they can teach these subjects, both face-to-face, virtual and hybrid.

Source: Prepared by the authors.

As can be seen in Table 3, the results and conclusions of the authors are related to the study variables of this research, in addition it is predominant that digital skills are an indispensable resource in this post COVID 19 pandemic era, consequently it was necessary to implement virtual classrooms and therefore tools that facilitate the teaching-learning process.

4. DISCUSSION AND CONCLUSIONS

These results are supported by each of the selected researches, especially Tapia et al, (2022) who consider that digital competences have a positive impact on the teaching of hybrid university classes; in the same way Cobero and Martínez (2019) who believe that it is essential for teachers of these times to acquire digital competences to be able to share their knowledge, using tools that can be adapted to blended learning; also Honeycutt and Sears (2020) express that hybrid classes will allow teachers to implement various technological strategies to offer first level classes to students; likewise, it should be considered what is mentioned by Zárate et al, (2020) the importance of having teachers trained in digital competencies, which in recent years have become essential for teaching classes, whether face-to-face or hybrid, all teachers need to have tools that allow them to facilitate the teaching-learning process.

In conclusion, the development of systematic literature reviews is important because it allows to have a clearer idea of the terms that are used daily with respect to digital competencies and hybrid classes; this review will serve for future teachers, students, managers and staff associated with universities as it encompasses the most important for

hybrid teaching. It is recommended that future researchers use this systematic review of the literature because it will help them understand a little more about the topic to be addressed.

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