Professional development needs in Digital Skills for Teachers: a case study

Necesidades de desarrollo profesional en competencias digitales docentes: estudio de caso

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Keywords
Digital skills for teachers; professional development; educational improvements needs

ABSTRACT

This paper presents the results of a research work focused on identifying educational improvements needs in the field of digital teaching skills (DTS) in higher education, specifically in a Teacher Training College. There are several frameworks to assess this, however, this research focused on those related to the competence: communication and collaboration described in the Marco Común de Competencias Digitales Docentes (MCCDD) (INTEF, 2017). The pandemic evidenced as an emerging requirement in terms of the DTS also national and international foundations in which it is highlighted how these are essential to support lifelong learning and to inclusion. Ten teachers from Veracruz participated in the study through the focus group technique, which made it possible to recover information to learn about their perspectives on the training needs they identified in the area of the DTS, both in themselves and in the degree program in education in which they teach. The MAXQDA program was used to analyze the information and graphs were created with the segments of their oral participations. The results are shown in Unique-Code Model (summaries) of each skill in the area of communication and collaboration.

Palabras clave
Competencia digital docente; desarrollo profesional; necesidades formativas; educación

RESUMEN

Este estudio expone los resultados de un trabajo de investigación centrado en identificar necesidades formativas en el ámbito de las competencias digitales docentes (CDD) en educación superior, específicamente en una escuela normal (EN). Se eligieron seis competencias derivadas del área de comunicación y colaboración, descrita en el Marco Común de Competencias Digitales Docentes (MCCDD). Además de que la pandemia evidenció como un requerimiento emergente la necesidad de desarrollar CDD, existen fundamentos nacionales e internacionales que lo respaldan, ya que son imprescindibles para apoyar el aprendizaje permanente y la inclusión. En el estudio participaron diez docentes de una EN del estado de Veracruz a través de la técnica de grupos focales, lo que permitió recuperar información para conocer sus perspectivas acerca de las necesidades formativas que identificaron en el ámbito de las CDD, tanto en ellos mismos como en la licenciatura en Educación en la que imparten clases. Para analizar la información se utilizó el programa MAXQDA y se diseñaron gráficos con los segmentos de sus participaciones orales. Los resultados se muestran en modelos de código-único (resúmenes) de cada competencia del área de comunicación y colaboración.

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INTRODUCTION

In Mexico, from the decree in which provisions of the third constitutional article are reformed, added and repealed, the need to have a digital educational agenda is mentioned for the first time, pointing out that this must be oriented towards the use of digital technologies in education. In this sense, at the beginning of the 2020 Agenda Digital Educativa (ADE) was published, which is included in the National Educational Agreement, in the precepts of the New Mexican School and in the General Education Law. This agenda brings with it the approach of moving towards the use of current technologies, which requires that teachers at all educational levels be trained in the acquisition of new skills, knowledge and competencies that are part of the digital culture. The shared idea is that:

> Educational processes have gradually, and not always effectively, introduced ICT (information and communication technologies). Today, ICT transformed into TICCAD (information technologies, communication, knowledge and digital learning, known in Spanish as TICCAD), as a result of the conceptual evolution of the term ICT and the application and use in the fields of learning, acquisition, construction and dissemination of the knowledge, which were born at the beginning of the first decade of the 21st century (Secretaría de Educación Pública, SEP, 2020, p. 12).

As part of the regulatory foundation on digital technologies, national policies recognize their relevance; for example, in Chapter innovation XI of the General Law of Education and digital learning. This description highlights that training competencies and digital skills must be promoted, both in students and teachers; likewise, it is mentioned that it is up to the educational authorities to promote training to develop the necessary skills in the use of TICCAD.

In correspondence with this law, in the General Law of Higher Education, in articles 44 and 45, information is presented on promoting that educational programs integrate content so that students acquire knowledge, techniques and skills about digital technology. In addition, it promotes digital skills that prioritize technologies directed towards digital learning.

Regarding the new curricular proposals for the Normal Schools, Agreement 08/16/22 establishes the study plans and programs of the degrees for the training of basic education teachers, in the section on curricular flexibility a Mention is made of four major distinctive features of these study plans, one of them is “flexibility in curricular development with the support of digital devices and educational platforms: that the curricular contents and learning situations can be developed in a hybrid manner without losing their particular pedagogy and didactics for these scenarios” (*Diario Oficial de la Federación*, *DOF*, 2022, p. 6). This feature opens a new list of possibilities for practicing teaching; however, it also

raises challenges regarding the competencies of higher education teachers for the relevant use of digital technology in educational tasks.

Additionally in the previously mentioned agreement, in the description in the knowledge domain- knowing how to be, learn and do- meaning is given to the importance of digital culture and the use of tools and technologies for linking with the world and the definition of personal learning trajectories. The domains of knowledge must be present in all didactic activities of the initial teacher´s training, and it is stipulated that it is necessary to consider them as an inherent part of the different courses that make up this curricular proposal (*DOF,* 2022).

In addition to this, all the study plans of Agreement 08/16/22 for the training of teachers (known in Mexico as Esculas Normales "EN") that began their implementation in August 2022, are made up of five paths in which the curricular mesh is organized. Path number five is called: languages and digital technologies, and in this, technologies are mentioned as "a complement in teacher training, with the aim of strengthening the pedagogical processes of teaching and learning, educational innovation, development of digital skills and knowledge, educational research and the design of hybrid education programs as part of the flexibility in the development of the curriculum" (*DOF*, 2022, p. 21).

That is, when carrying out an analysis of how the term *digital technology* appears in these study plans, which are the main input for teaching and learning in teacher training institutions, it can be concluded that those who work as teachers in higher education, specifically in the ENs of the country, will need to face processes that lead to continuous updating and improvement in the issue of digital technology. The above is because, being part of the distinctive features of the domains of knowledge and one of the paths of the curricular mesh, they represent an important weight in the essence of the approach and a prevailing need to make transversal digital technology in the planning, implementation, monitoring and evaluation of the courses that are part of this curricular proposal.

In addition to this panorama of national regulations, and the current curricular proposal in teacher training, there are national and international approaches that describe the relevance of digital competencies in support of lifelong learning and inclusion. An example is UNESCO (2019), whose publication on *ICT competency framework for teachers* highlights that technological and pedagogical evolution must point towards inclusive, open access and equitable principles. To achieve this, it proposes a series of aspects that teachers need to consider when using ICT in their educational practice, including understanding the role of ICT in education, integrating it into the curriculum and assessment processes, as well as in organization and administration, in addition to using them for their own professional learning.

In 2022, ANUIES, MetaRed México and ANUIES-TIC conducted a study using the DigCompEdu Check-in self-assessment tool. This shows the results of the self-assessment of identify areas of opportunity in various universities in the country, which allows for greater knowledge of the requirements of the teaching community to propose improvements in teaching digital abilities. The study is based on the premise that educational institutions and teachers will be observed to analyze how they use digital technologies in communication, collaboration in learning and content creation (Ponce-López *et al.,* 2021).

For this investigation, two reference frameworks were consulted. One was the Common Framework of Digital Teaching Competencies (*Marco Común de Competencias Digitales Docentes*, MCCDD) (INTEF, 2017), which defines the competencies that teachers must develop towards the improvement of their educational practice and for continuous professional development; this is made up of five areas and 21 competencies in terms of knowledge, abilities and attitudes. The Digital Teaching Competence Reference Framework (*Marco de Referencia de la Competencia Digital Docente,* MRCDD) (INTEF, 2022) was also reviewed, which is organized into six areas and 23 competencies distributed in these areas. With these references, it was possible to propose an exploratory study to focus on the training needs that EN teachers identify and, with this, explain their perspectives through the findings derived from this research.

The National Institute of Educational Technologies and Teacher Training (INTEF), dependent on the Ministry of Education, Culture and Sports, has proposed a project since 2012 to enable an MCCDD. This work generated a series of reviews; in 2017, the competency areas and a breakdown of the competencies that teachers can use as a reference throughout their professional career to advance levels were presented (see table 1). The examples of application of these competencies in the teaching task range from a basic to an advanced level, with basic A1 and A2, intermediate B1 and B2, and advanced C1 and C2.

Obviously the MCCDD 2017 is too broad, so for this study, area 2, communication and collaboration, was chosen, defined as “communicate in digital environments, share resources through online tools, connect and collaborate with others through tools.” digital, interact and participate in communities and networks; intercultural awareness” (INTEF, 2017, p. 9).

Although the MRCDD 2022 also proposes competencies related to communication and collaboration, for this work the six competencies that are grouped in a competency area 2 were specifically used to represent an organization in accordance with the objective of the study, so that the MRCDD 2022 is used to complement the analysis of the results.

Table 1. Breakdown of competencies by area of the Common Framework of Digital Teaching Competencies 2017

Information and information literacy	1.1. Browsing, searching and filtering information, data and digital content 1.2. Evaluation of information, data and digital content 1.3. Storage and retrieval of information, data and digital content
Communication and collaboration	2.1. Interaction through digital technologies 2.2. Share information and digital content. 2.3. Online citizen participation 2.4. Collaboration through digital channels 2.5. Netiquette 2.6. Digital identity management
Creation of digital content	3.1. Digital content development 3.2. Integration and reworking of digital content 3.3. Copyright and licenses 3.4. Programming
Security	4.1. Device protection 4.2. Protection of personal data and digital identity 4.3. Health protection
Troubleshooting	5.1. Resolution of technical problems 5.2. Identification of technological needs and responses 5.3. Innovation and use of digital technology creatively 5.4. Identification of gaps in digital competence

Note: this table shows all the competencies that make up a capable area.

Source: adapted from INTEF (2017, pp. 10-25).

As shown in Table 1, the communication and collaboration area is made up of six competencies. In the description made, its relevance for the practice of teaching and other substantive areas in EN, such as research, tutoring and dissemination, can be highlighted. Each of these substantive functions requires the teacher to carry out activities both in face-to-face environments and in virtual environments, which is why the need to analyze what academic activities they are used in, what level of competence they start from and what updating training actions are identified. Continuously you can advance in level until you are at the advanced level.

Specifically, this research focused on analyzing the training needs of EN teaching staff in teaching digital competencies (CDD) focused on the area of communication and collaboration in digital environments. The objective was to determine which of these competencies are priorities in professional development through continuous training processes that can be proposed for higher education institutions.

Several previous studies related to teaching digital competencies were identified. One of them was that of Acuña-Gamboa and Centeno-Caamal (2023), who pointed out that the participants expressed the need for a continuous training strategy in digital skills that addresses specific needs but also emerging digital skills on the creation of content and implementation of the hybrid educational modality. In a study carried out by Fernández-Márquez *et al.* (2018) on digital competencies in higher education teachers, an experience is described in the delimitation of the digital competencies that teachers possess, the ICT they use and the perceptions about the importance of promoting these competencies in students at a university in Malaga.

Likewise, three investigations related to CDD diagnoses were located. The first by Velázquez and Andrade (2022) was carried out in the indigenous area, where a diagnosis of training needs was carried out through the characterization of the current profile of digital skills in students of the degree in preschool education and primary education for the indigenous environment. A second investigation by Glasserman and Manzano (2016) focused on digital skills and pedagogical practices in primary education within the framework of the Compu.MX program, where the digital skills of teachers were evaluated with an online simulator, through a self-administered questionnaire on computer skills and pedagogical practices. The third diagnostic study carried out by Robles *et al.* (2016) on digital teaching competencies in higher education teachers showed that although teachers had considerable development of CDD, adequate use of ICT was not made in teaching practice; among the proposed recommendations was to seek strategies to integrate these tools into daily work.

Cabero-Almenara and Palacios-Rodríguez (2020) mention that there are different studies that support the importance of CDD in new literacy contexts, which is why it is necessary to evaluate training plans to improve the digital competence of teachers, which represents a line of work of this study, since it contemplates a specific context and the training needs that derive from it. Furthermore, in another investigation by Cabero-Almenara *et al.* (2022), the results of the validation of a training proposal and the perception of how the digital and entrepreneurial skills of pedagogy students are developed were analyzed.

The background studies presented in previous paragraphs show the current relevance of the topic and the need to continue contributing to the field of knowledge of teaching digital competences. For this reason, the present research is timely, while it is directly related to new training models, since it recognizes the growing importance of the use of digital technology in the initial training of teachers. As study plans and programs have been renewed, these models have been incorporated more and more explicitly into different documents that guide and organize the training of future basic education teachers in the country.

DESIGN

This qualitative study, of exploratory scope and with a phenomenological approach, had the purpose of collecting data to understand the experiences of teachers of an EN in the state of Veracruz in digital teaching competencies for communication and collaboration. The phenomenological approach, according to Fuster (2019), must involve mechanisms for the search of meanings, since "knowing experiences through stories, stories and anecdotes is essential because it allows us to understand the nature of the dynamics of the context and even transform it" (p. 202). With this in consideration, the purpose was to learn about personal experiences and obtain examples of the participants' competencies in the previously mentioned area.

SAMPLE

The study was carried out through a non-probabilistic convenience sampling technique, so that "accessible cases that agreed to be included" were selected. This is based on the convenient accessibility and proximity of the subjects for the researcher" (Otzen and Manterola, 2017, p. 230). To define the cases, the department heads of the five EN degrees were asked, through a letter, to propose two professors to participate in a focus group. In total ten teachers participated, two from each degree. The inclusion criteria were: 1) be part of the teaching staff, 2) have teaching experience of at least three years, 3) be currently teaching in a group and 4) show interest in participating in a focus group on technology.

Emphasis was placed on the premise of including those who wished to comment on their experience in the use of digital technology to communicate and collaborate both with their colleagues and with the student body in their initial teacher training, without technology necessarily being their area. of experience or content of your course.

With the teachers' proposals, the list of participants was completed; they were divided into two focus groups with a teacher from each degree (see table 2). The meeting for the groups was scheduled for February 28 and March 1, 2023, so they were organized as presented in table 2.

Table 2. Nomenclature of participants in focus groups

Degree	Focus group 1	Focus group 2
Primary	Primary 1	Primary 2
Physics	Physics 1	Physics 2
Preschool	Preschool 1	Preschool 2
Special	Special 1	Special 2

Middle School	Middle School 1	Middle School 2
Middle School	Middle School 1	Middle School 2

Note: each nomenclature is different because it serves a different teacher.

INVESTIGATION TECHNIQUES AND INSTRUMENTS

Focus groups require planning for how they will be implemented, including the decision to do them in physical or virtual spaces. Benavides *et al.* (2021) mention that:

> The purposes of the research or evaluation project determine aspects of the focus group design, including the type of structure that will be followed, the moderation that will be carried out based on an interview protocol, the type of interaction that will be sought, the information that is expected to be obtained, as well as the approach that will be taken to analyze/construct the data (p. 36).

For this research, face-to-face meetings were held lasting an hour and a half. A script of semi-closed questions was used to encourage everyone's participation. Table 3 shows the questions by competency; these were translated into analysis categories.

Table 3. Items by competency for the development of the focus group

Competence	Items
Interaction through digital technologies	• What applications or interaction and communication services do you use with your teaching colleagues or with students? Have you seen some that are most used in your degree? Which ones? • Which of these services or applications do you think work best for the interests and needs of students and teachers in accordance with the academic activities of the degree? Why?
Sharing through digital technologies	• If you have an online collaboration network with other colleagues or students, what type of information do you share and how do you carry out this action? Is there a collaboration group or network in your degree? For what purposes? How do you find it? Do they fulfill those purposes?
Online citizen participation	• What types of activities do you promote so that your students participate as digital citizens? For example: that they become aware of their rights and obligations, that they recognize intercultural values, that they participate in social projects, that they be protagonists of their own learning. Is there a project of this type in your degree? Explain

Collaboration through digital channels	• In what way have you participated or proposed processes that involve your online collaboration in communities for academic purposes? Is there any proposal for your degree? • What tools or applications do you consider most appropriate for collaborative work in your academic activity or related to your degree?
Netiquette	• What experience have you had to moderate online participation with conscious management of writing and communication rules in different spaces with students or teachers? Do you consider that this has been done for your degree? How is it done? • If you have had experience with internet abuse or cyberbullying in your degree, by students or teachers, how was it detected and how did you act on it?
Digital identity management	• How do you promote concepts such as digital reputation or image control on the internet, both for yourself and for your classmates or students in your degree? • Do you or some other undergraduate teachers address how accounts are managed securely? For example, the use of *cookies*, access codes, among other forms of digital security

A PowerPoint presentation was used for each focus group. A slide provided a contextualization of teaching digital competence in higher education, followed by questions related to one of the competences. This allowed all participants the opportunity to share their experiences and perceptions of their degree, without losing sight of what was being asked.

The session was audio recorded through a high-end cellular device, which was placed in front of the participants. Likewise, it was recorded on video using the Zoom application, using the camera and microphone resources located above the participants. Subsequently, the information was transcribed for analysis, which was carried out through the MAXQDA 2022 program. Figure 1 shows the analysis screen of the program.

To analyze the transcripts, the Focus Groups function that is included in MAXQDA 2022 was used, which allows each participant to be distinguished in the text and assign them a code, which facilitates comparison between them. In the code system, the categories are presented with different colors and were raised in correspondence with the six competencies stated in table 3. The operational definition was taken from the MCCDD (INTEF, 2017).

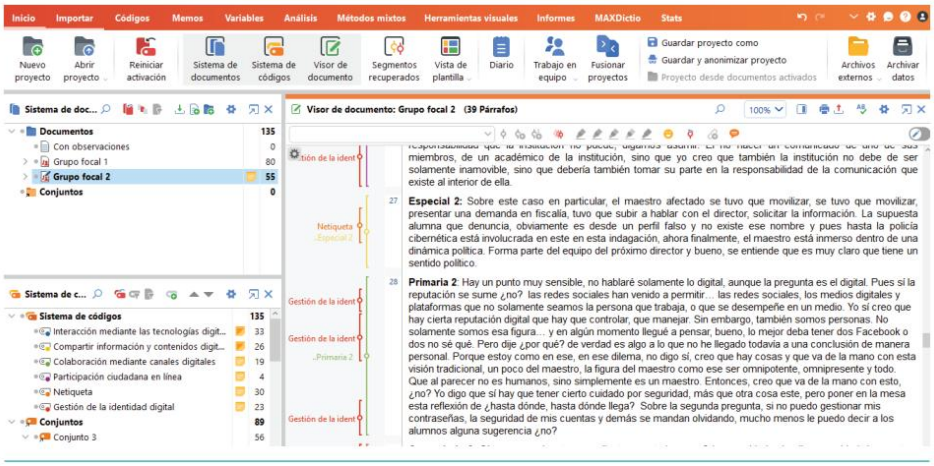

Figure 1. Analysis at MAXQDA 2022.

RESULTS

The presentation of the results was done through single code models. To structure the schemes that organize the information of the contributions into text segments, the MAXMapas function was used, and six unique code schemes were generated, where the segments with the textual contributions of each of the participants can be read.

Figure 2 presents the single-code model (summaries), with the interaction competence through digital technologies, which is defined by INTEF (2017) as:

> Interact through different digital devices and applications, understand how digital communication is distributed, presented and managed, understand the appropriate use of different forms of communication through digital media, contemplate different communication formats, adapt communication strategies and modes to specific recipients (p. 25).

Teachers mentioned that they use various tools for different purposes. For example, they use instant messaging applications such as WhatsApp to communicate quick ideas, while for academic work they prefer video calling platforms or applications with pedagogical functions, such as Zoom or Google Meet.

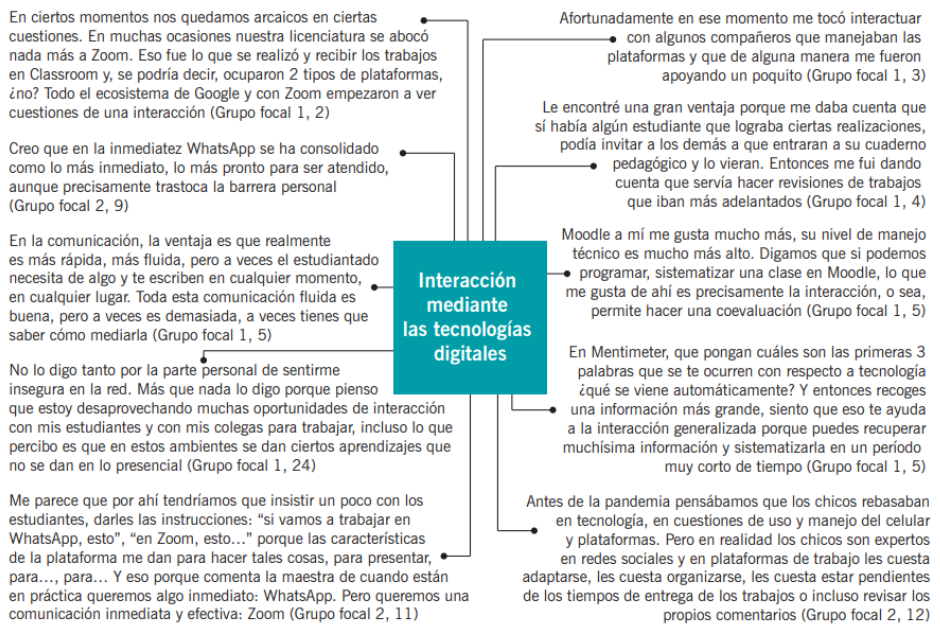

Figure 2. Single-code model (summaries). Interaction through digital technologies.

On the topic of social networks, the importance of establishing limits on their use to respect schedules and personal spaces was mentioned on several occasions. There are no known specific policies or proposals from the institution regarding the use of tools, applications or social networks, therefore, it depends on the criteria of each teacher and even on the recommendations made by students based on ease of use.

It is recognized that this flexibility in the use of tools favors collaborative learning and the understanding of new teaching models. With the information that the participants provided about this competence, needs were identified to expand their knowledge about the range of tools that exist for online communication, to select the most appropriate ones according to the pedagogical or learning intentions, as well as the ability to adapt your communication modalities by making a distinction between the recipients of that information.

Regarding the competence to share information and digital content, this is defined as:

> Share the location of information and digital content found, be willing and able to share knowledge, content and resources, act as an intermediary, be proactive in the dissemination of news, content and resources, know citation and reference practices and integrate new information into the existing body of knowledge (p. 27).

The contributions of the participants focused mainly on sharing digital content, resources and organizing information in cloud folders; there were few comments on news dissemination or citation practices (see figure 3).

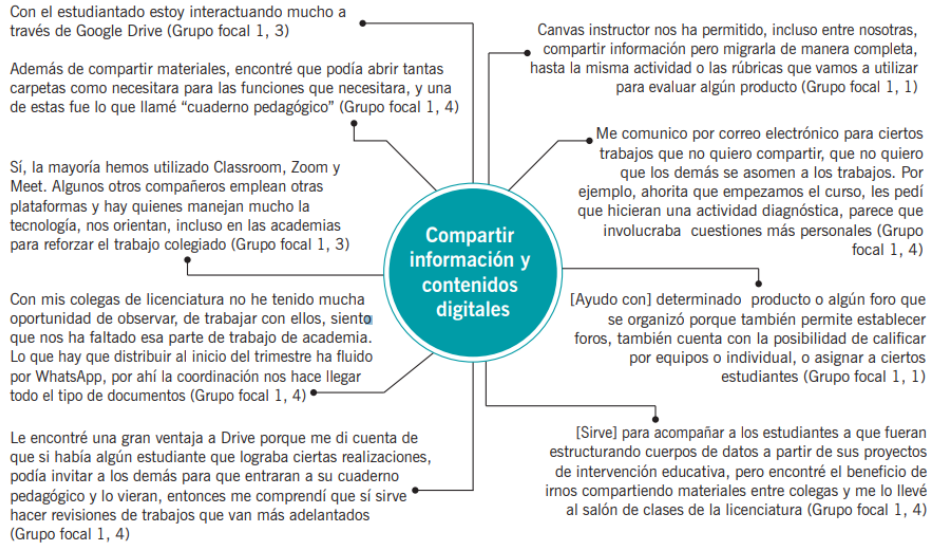

Figure 3. Single-code model (summaries). Share information and digital content.

One of the problems is related to the storage of digital content, since there is no institutional repository or virtual library, coupled with the fact that there is no official space to store information, except for institutional Microsoft Teams accounts that grant access. to OneDrive. However, most of the staff are not familiar with the use of this tool, since the use of Google Drive has been more common. Regarding this, ways have been gradually discovered to take advantage of it beyond storage, such as to promote collaborative work or for the so-called pedagogical notebooks.

In the development of class sessions, it is increasingly common for electronic or multimedia files to be generated. These products use the Google accounts of students and teachers and are not saved in places that facilitate their storage or even sharing them with other members of the institution or other institutions, which restricts their dissemination. For its part, WhatsApp, despite having a function more focused on instant communication, has been used as an official means to share documents between managers, faculty and students.

Regarding the competence of collaboration through digital channels, this is defined as "using technologies and media for teamwork, for collaborative processes and for the common creation and construction of resources, knowledge and content" (INTEF, 2017, p. 30) (see figure 4).

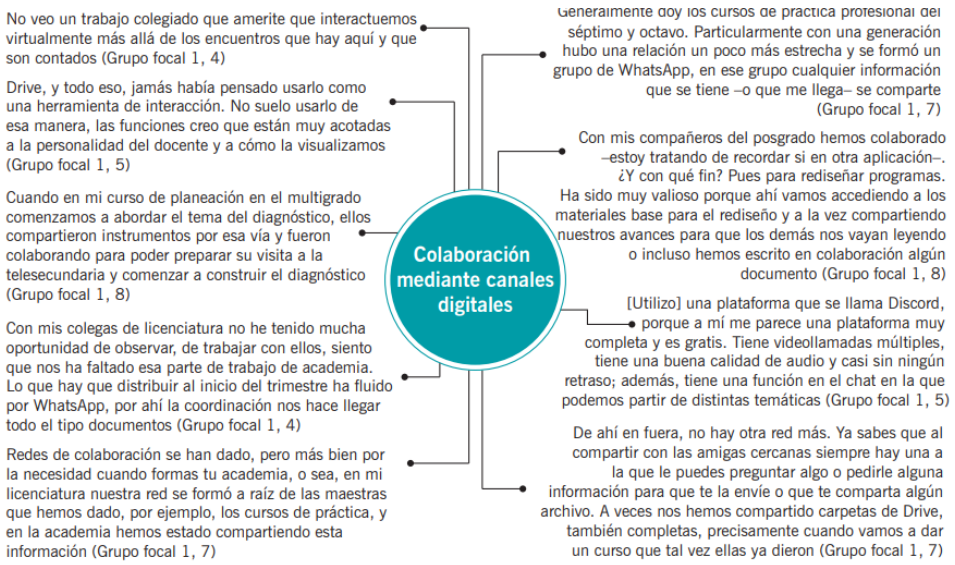

Figure 4. Single-code model (summaries). Collaboration through digital channels.

This proficiency is complex because it involves collaborative work and involves the formation of networks. It was evident that, although the need for collaboration between the different degrees is recognized and how this can promote common projects with training purposes, it is not promoted institutionally, but collaborative projects usually arise from individual initiatives.

Another relevant aspect is collaboration between peers, which implies collaborative learning. Although there are proposals to encourage interaction between students, such as teamwork, participation in forums or solving joint tasks, digital technology is not necessarily used for this. Instead, the idea that each student must individually commit to the learning objectives of the courses, demonstrating their understanding through printed products, tends to prevail. Furthermore, there is a lack of trust in the authorship of collaborative projects, in the correct use of information from other authors and in ethics to avoid plagiarism.

It is striking that resources like Drive, which have been present for several years, have been discovered when used in the pandemic, coupled with the fact that it is not only being used as a repository of material or storage, but as an application to collaborate with files online.

Among the aspects that have not been achieved is the formation of online communities or collaboration networks. In the focus group it was mentioned that there are no networks with the purpose of creating and disseminating content among teaching staff of the same degree, and even less between different degrees. This topic was discussed, highlighting the

need to promote the creation of virtual spaces to form communities for professional purposes.

According to the INTEF (2017), the online citizen participation competence is: "getting involved with society through online participation, seeking technological opportunities for empowerment and self-development in terms of technologies and digital environments, be aware of the potential of technology for citizen participation" (p. 29). This competition had little information recovery, some of the participants did not even contribute any experience in this regard, so it was not recognized that the institution promoted online citizen participation (see figure 5).

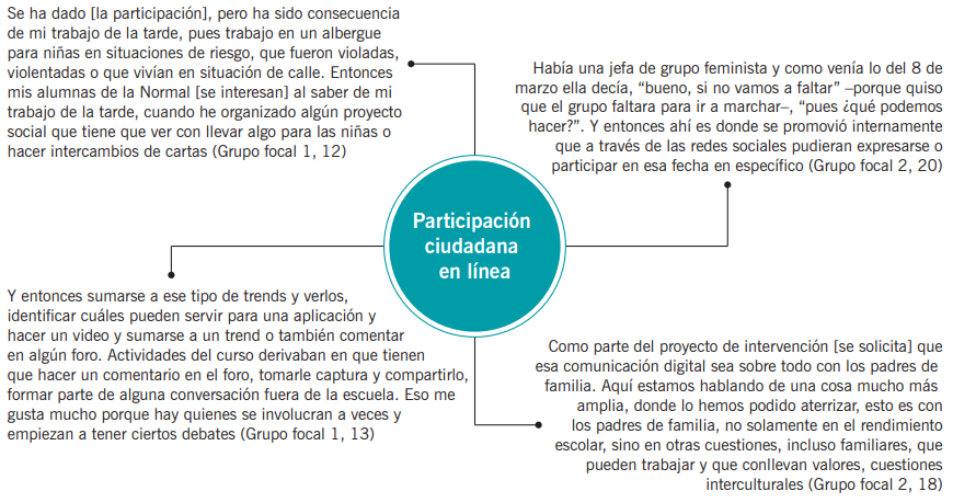

Figure 5. Single-code model (summaries). Online citizen participation.

This proficiency allows the development of projects for the training of students as digital citizens; however, the existence of any proposal was not cited. What was expressed was associated with specific dates, such as the commemoration of Women's Day, and only at the initiative of students or some teachers, but not as regular activities or linked to social, political or cultural events.

The institution promotes participation in various events that have social weight, related, for example, to sustainability or inclusion, but there is a lack of a citizen participation project to promote inclusion or strengthen democracy. It is important that actions are guided so that institutional platforms are accessible to all and that spaces are opened for dialogue. This requires the approach of training processes that lead teachers to include in their planning of activities topics of social relevance and civic education, rights and responsibilities, as well as topics that address the empowerment of students through digital media.

For this proficiency, it is necessary to analyze the impact of publications on social networks, both the institution's networks and those of teachers and students, since a broad public is guided by the opinions expressed in these spaces. Managers, teachers and students leave a digital footprint in these publications, so it is important to reflect on the shared content. It is crucial to take care of both institutional and personal information, as well as consider how the image is projected to the outside.

Netiquette proficiency, according to INTEF (2017), means "being familiar with the rules of conduct in online or virtual interactions [...] awareness regarding cultural diversity, being able to protect oneself and others of possible online dangers [...] the identification of inappropriate behavior" (p. 16) (see figure 6).

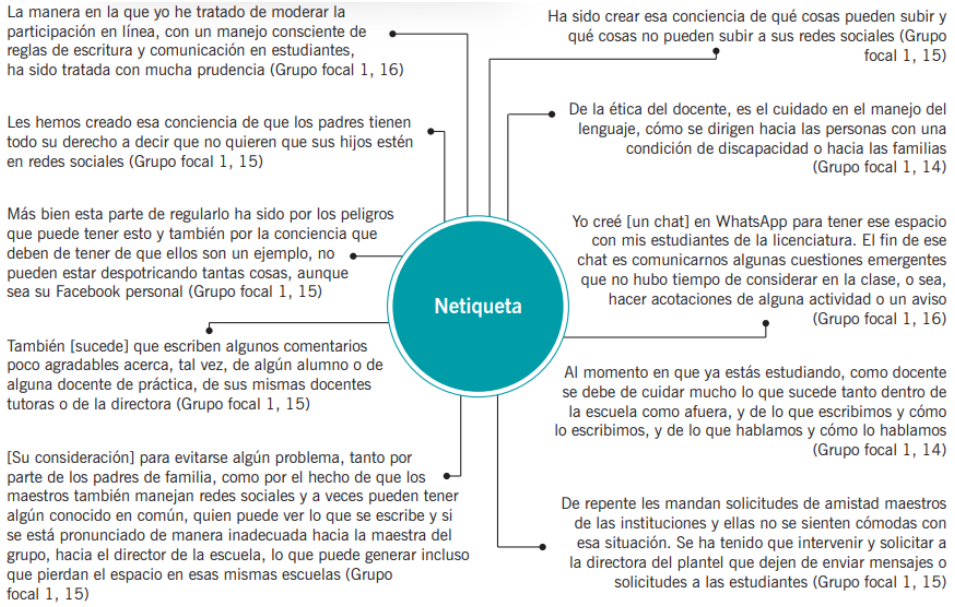

Figure 6. Single-code model (summaries). Netiquette.

The netiquette competition revealed trainers' concerns about not having elements related to moderation in online environments. Some examples were mentioned about the use of WhatsApp, which is used for personal situations but also for professional issues, such as contact with teachers and families from practice schools. This has generated difficulties in moderating their use and preventing communication problems. Likewise, there is interest in understanding the use of social networks and in establishing regulations for publications, to avoid misinformation or discomfort caused by what is shared about schools or basic education personnel involved in the practice.

Finally, digital identity management is a competence that entails "creating, adapting and managing one or more digital identities, being able to protect one's digital reputation and managing the data generated through the various accounts and applications used" (INTEF, p. 35). The contributions of the participants highlighted that they recognize in themselves and in other teachers or students the lack of knowledge about what to do to protect the security of their accounts; it was also mentioned that until recently personal accounts were used, since there were no institutional accounts for students or teachers, so they faced various challenges, such as the exposure of personal information in the workplace or the neglect of digital reputation. In some cases, measures are adopted to avoid accepting friend or follower requests from students until they graduate (see figure 7).

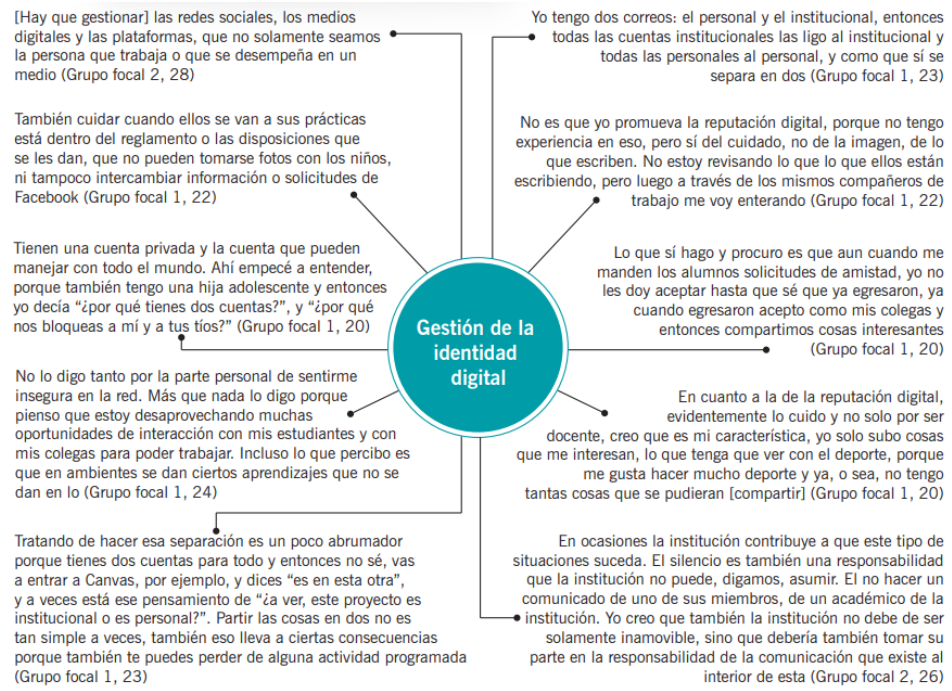

Figure 7. Single-code model (summaries). Digital identity management.

Furthermore, the fear of being impersonated or of going through some situation of defamation on the internet was made known, since a case like this had recently been experienced by a teacher. In addition to this, it was mentioned that the institution does not promote this competition, and that it does not even take a position even though controversies have arisen due to publications in digital media. At this point it is worth noting that the participants mentioned the creation of two email accounts or profiles on social networks, one personal and one institutional.

As can be seen, from the recovery of information in the focus groups, the conversations that were generated contain relevant experiences on each topic. From all the comments presented in the single-code models of the six competencies, the importance of prioritizing communication and collaboration needs was identified.

CONCLUSION

The objective of this study allowed us to recognize that professional development in communication and collaboration proposed in the MCCDD of the INTEF, 2017, is a need that was evident in the times of pandemic and post-pandemic. Teaching encounters countless problems in the teaching-learning processes, a situation from which the following question arises: what can be done so that teachers have the necessary training to face the challenges they face in the field of education? digital culture?

The contributions of the participants show that there is a need to expand the range of applications or tools to communicate information according to differentiated purposes, such as the use of emails, blogs, social networks, virtual classrooms, among other options that have depended on the interest of students or teachers, instead of being driven by training or organizational proposals of the institution.

Regarding the exchange of information, it was noted that the contributions focused on recognizing the importance and benefits of staying connected and sharing content; however, the specific tools to carry out this exchange were not mentioned, nor when or with whom it is carried out. It is necessary to promote these spaces and provide elements to opt for digital resources according to the audience or type of users. In a critical understanding of the competencies and how they are favored by the teaching function, the institution itself must implement actions that identify how learning can be done collaboratively by using tools and applications to support teaching and learning with digital media.

In the same way, it seeks to generate opportunities for citizen participation of students and teachers, since no proposal is identified in which they can participate with personal comments about topics relevant to society. Comments were also made about the need to know how to enforce the copyright of digital content and what information should be included in the identification of videos or other multimedia materials that are disseminated on various platforms or social networks. It is necessary to regulate aspects related to the forms of interaction and data security for netiquette in official communication and academic interactions.

The work highlights the importance of continuous training in higher education, with the aim of providing how these training needs are translated

into proposals for the improvement and updating of teachers. It should be recognized that, in teaching, as well as in other professions, work environments are changing due to various factors, both those that occur within the institution and externally, including the transformation of society that demands multiple capabilities on the part of the faculty. This research contributes to a current and relevant topic, such as digital technology for learning and as a mediator in support of teaching work. Furthermore, it contributes to the specific field of CDD development focused on communication and collaboration, fundamental tasks in EN education.

Considering that digital technologies are a relevant topic on the national agenda, and specifically in initial teacher training, it is essential to have a diagnosis limited to the context for which it is directed. However, to contribute in a timely manner to the continuous training of teachers in a higher education institution, it is necessary to understand the complexity that teaching practices represent, assuming that the school and all the processes that make it up are changing and its operation involves an interaction between different agents: administrators, managers, teachers, students and the community itself in which it is located.

Although the issue of ICTCAD is raised in the Digital Educational Agenda of Mexico and in the General Education Law, it is complicated to analyze the improvement or development of CCD because in the country there is no instrument endorsed or defined by the educational authorities, a validated CDD framework for educational levels, or at least a proposal of indicators that establish a starting point and a trajectory to achieve what is expected of teaching in terms of digital competencies. Despite this, there are indicators that other countries have generated to visualize areas of opportunity for training that allow teachers to know and develop the digital skills necessary to appropriately use the various resources available to them. As a pending for future research, it is proposed to review the competency frameworks of other countries and propose one for the context of higher education in Mexico.

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