



## Original Research

# Teachers' Perceptions of Technologies and Other Educational Challenges Prior to the Pandemic

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**Abstract:** The emergence of COVID-19 in education posed a challenge for teachers around the world, who faced it with differing levels of knowledge, competences, and digital resources. The aim of this study is to ascertain the teachers' ( $n = 930$ ) perceptions on the use of technology in the classroom, the main challenges in education, and the teaching profession prior to the pandemic in Spain and Latin America. For this purpose, mixed methods were adopted, and an ad hoc questionnaire was created and validated through expert judgment. The results show a high use of technology while confirming shortages in resources, connectivity, and teacher training. Also, an average rating is obtained in the areas of digital teaching competence based on the Common Digital Competence Framework for Teachers (Spain). In addition, student motivation related to technology is seen as one of the main challenges for teachers. Finally, teachers are motivated, but they feel that their motivation is decreasing; they call out for greater recognition of their profession. This study helps identify the strengths of teachers in relation to technology in order to continue to strengthen them and shortages in order to acknowledge and address them. It also allows for an understanding of the emerging issues that pose challenges for current educational research.

**Keywords:** Educational Technology, Teacher Training, Teacher Competences, Educational Resources

## Introduction

The implementation of information and communication technology (ICT) in formal education has long been of interest to the scientific community, with a rise in research since the emergence of COVID-19. The United Nations Educational, Scientific and Cultural Organization (UNESCO) acknowledges that we were not prepared for disruption on such a scale (International Institute for Higher Education in Latin America and the Caribbean [IESALC] 2020) or for fully remote learning (Organisation for Economic Co-operation and Development [OECD] 2020).

This sudden digital transformation has triggered a rethinking of the teaching and learning process, in which teachers continue to be the main driving force for integrating technology into the classroom (Engen 2019; Fernández Márquez et al. 2019; García Contador and Gutiérrez Esteban 2020; Gomez Zermeño and Eligio Mendoza 2022; IESALC 2020; Lomba Portela and Pino-Juste 2020). However, the pandemic has demonstrated a gap between education systems that previously had the necessary technology and trained teachers and those that did not (Burns 2020; Cervantes Holguín and Gutiérrez Sandoval 2020).

Although there is much research on technology applied to education, it is necessary to understand the conditions in which teachers faced the new manner of teaching in order to address the emerging needs that have been brought on by COVID-19 (Colás-Bravo 2021).

## Challenges in Education Today

The study carried out by Lourdes Montero and Adriana Gewerc (2018) on the teaching profession highlighted the need for an educational transformation due to the technological thrust. Following these authors, this hyperconnected society in which we live invites schools, in general, and teachers, in particular, to change teaching and learning in response to current needs.

Currently, the COVID-19 pandemic has been challenging for the educational community, especially for teachers who experienced the transition to remote instruction in record time. For this virtual experience to be positive, it must be supported by a suitable change in teaching (IESALC 2020). It is essential to train teachers to integrate ICTs in order to communicate the content to be taught and support its pedagogical use as the Technological Pedagogical Content Knowledge Framework envisioned (Koehler and Mishra 2008). In this area, Gómez-Gómez (2021) considers teacher training from the triple perspective of teaching, technology, and people. However, it is also necessary to highlight the importance of making ethical and responsible use of technology as well as developing critical thinking skills in the face of widespread misinformation or fake news (Peart, Cubo-Delgado, and Gutiérrez-Esteban 2022). In any case, as some pre-pandemic studies (Arancibia Muñoz, Cabero Almenara, and Valdivia Zamorano 2019; Escofet et al. 2019; García Contador and Gutiérrez Esteban 2020; Mercader 2019; Rodríguez-Jiménez, Gómez-García, and Romero-Rodríguez 2019) pointed out, teacher training and the use of technology in the classroom are two challenges for twenty-first century teachers.

Additionally, communication between teachers and students, both in and between these groups, has been affected (IESALC 2020) since the loss of socialization routines in education generates social isolation. This is a reminder of the importance of social and cultural factors in the integration of technology into the classroom (Engen 2019; Inchaouh and Tchaïcha 2020). Moreover, as Mark Peart, Sixto Cubo-Delgado, and Prudencia Gutiérrez-Esteban (2022) pointed out, there is a need to develop digital and socio-civic skills as key aspects to educate in digital citizenship.

In any case, in the uncertain times in which we live, it is necessary to know and analyze the obstacles that teachers face during any change process. In this way, possible resistance to change can be better resolved (Lomba Portela and Pino-Juste 2020).

## Technology in the Classroom and Teachers' Digital Competence

Digital competence is considered as one of the eight key competences for lifelong learning (European Commission 2018a, 2018b), and it is taking on an ever-greater role since the COVID-19 pandemic. This competence requires the coordinated development of skills,

knowledge, and attitudes in ICT environments (Ferrari 2013; National Institute of Educational Technologies and Teacher Training [INTEF] 2017).

In Latin America, as in Spain, technology has been introduced into the education system since the 1980s through public policies centered on improving ICT connectivity, access, and use in schools (Silva et al. 2019). In general, integration has been uneven, with a focus on providing infrastructure and less attention on teacher training (Beltrán-Sánchez et al. 2019; Engen 2019; Gairín Sallán, Castro Ceacero, and Mercader Juan 2017; Martínez-Rodrigo, Martínez-Cabeza Jiménez, and Martínez-Cabeza Lombardo 2019), with Chile and Uruguay as benchmarks (Silva et al. 2019; Silva, Usart, and Lázaro-Cantabrana 2019).

According to the European Commission (2018a), it is essential to follow a reference framework to develop and evaluate this competence, such as the UNESCO ICT Competency Framework for Teachers (UNESCO 2018) or the European Digital Competence Framework for Educators (Redecker and Punie 2017). In fact, these frameworks have influenced the development of national digital frameworks, such as the Common Digital Competence Framework for Teachers (INTEF 2017) in Spain, the ICT competences for teachers' professional development (Ministry of National Education 2013) in Colombia, or the ICT Competencies and Standards for the Teaching Profession (Ministry of Education 2011) in Chile.

Regarding evaluation, there are currently several tools, most of which are for self-assessment and self-reflection (Redecker and Punie 2017; Silva, Usart, and Lázaro-Cantabrana 2019), such as the Digital Teaching Competence Portfolio from INTEF (2017), SELFIEforTEACHERS or the CheckIn for Higher Education from the European framework for the Digital Competence of Educators (European Commission, n.d.). These tools help teachers discover digital potential, reflect on their attitude toward ICTs, and learn how to embed them into the classroom. In fact, as Arancibia Muñoz, Cabero Almenara, and Valdivia Zamorano (2019) suggested, teachers' positive attitudes affect their ability to use technology in the classroom. Moreover, Joaquín Gairín Sallán, Diego Castro Ceacero, and Cristina Mercader Juan (2017) concluded that a high level of digital competence is associated with a more positive view of the effect of ICTs in active learning and training.

The arrival of the COVID-19 pandemic accelerated the digital transformation of education, making teachers face rapidly changing demands to develop digital competences. Although several frameworks for digital competence for educators were already established on an international and national level (see Redecker and Punie 2017), it was essential for teachers to become aware of these recommendations. The COVID-19 scenario acknowledged the need for national frameworks to develop digital teaching competences in order to certify the digital competence of teachers (see for example Agencia Estatal Boletín Oficial del Estado [State Agency for the Official State Gazette] 2020).

Some years ago, the Digital Education Action Plan (European Commission 2018b, 2020) already highlighted the opportunities offered by digital transformation, emphasizing the risk of living in a society poorly prepared for the future. In the current context of digital

transformation in the different educational stages, management and teachers' technological leadership is essential (López Belmonte et al. 2019) since it enhances not only communication processes but also training and teaching-learning processes.

Therefore, it seems that understanding teachers views about technology and other educational challenges before the COVID-19 pandemic may help us unveil the initial state of teachers in relation to the use of technology before facing emergency remote teaching. Thus, the purpose of this study is to investigate teachers' attitudes toward (1) the use of technology in the classroom, (2) the main challenges in education, and (3) the teaching profession just before the COVID-19 outbreak.

## Method

### Participants

For this study, a mixed method and a non-experimental descriptive research design was conducted with teachers from different educational stages in several countries. A total of 1,257 people from twenty countries participated in this study, but 327 people were excluded because they did not provide either their sociodemographic characteristics, complete the frequency of ICT use section, or were not schoolteachers. The final sample consisted of 930 participants with ages ranging from 22 to 66 years old ( $M = 46.30$  years;  $SD = 8.603$ ) and 18.60 years ( $SD = 9.53$ ) of teaching experience.

A non-probability snowball sampling method was used in which the participants for the study were recruited from all educational stages. Table 1 lists the demographic characteristics of the study participants; statistical analysis by country has not included sample sizes ( $n$ ) smaller than ten.

Table 1: Sample Data by Country ( $N = 930$ )

Country	Participants ( $n$ )	Age ( $SD$ )	Years of Teaching Experience ( $SD$ )
Spain	834	46.50 (8.45)	18.69 (9.52)
Mexico	44	44.84 (9.39)	18.59 (10.22)
Chile	10	37.80 (9.80)	11.30 (7.50)
Peru	10	42.80 (7.55)	17.50 (5.36)
Colombia	8	50 (9.73)	26.13 (11.98)
Dominican Republic	5	34.20 (7.19)	11.20 (7.19)
Argentina	5	52.80 (5.76)	17.20 (9.37)
El Salvador	2	45.00 (8.49)	16.50 (4.95)
Ecuador	1	46	6
USA	1	53	17
Belgium	1	46	17
Brazil	1	45	17
Canada	1	62	15
Guatemala	1	43	27
England	1	58	23

<i>Country</i>	<i>Participants (n)</i>	<i>Age (SD)</i>	<i>Years of Teaching Experience (SD)</i>
Italy	1	60	30
Morocco	1	57	30
Paraguay	1	31	6
Netherlands	1	37	10
Turkey	1	42	18

### Instrument

The instrument used for this study was an ad hoc questionnaire designed by BlinkLearning in collaboration with the Rey Juan Carlos University (URJC) in Madrid. BlinkLearning is a Spanish company that has provided support and digital school content to users in sixty different countries since 2010. It is currently present in more than eleven thousand schools in Spain, Latin America, and the United States.

To ensure the reliability of the instrument, content validation was conducted through a panel of eight experts from Spain and Latin America from different educational stages. They assessed each item on the dimensions of clarity, relevance, consistency, and sufficiency. Their opinions were taken into consideration, and some questions and response options were modified. Consequently, the final version of the questionnaire was comprised of thirty-six items (see Table 2) divided into four categories (general information, technology in the classroom, challenges in education, and teaching profession), containing five-point Likert scale questions, multiple response questions, and open-ended questions.

Table 2: Questionnaire Categories, Variables, and Number of Items

<i>Variables</i>	<i>Number of Items</i>
General Information	
Age	1
Years of teaching experience	1
Country	1
Other	4
Technology in the Classroom	
Use of ICT	3
ICT devices, resources, and tools	5
Teacher digital competence	1
ICT training	3
ICT motivation	2
ICT advantages	2
Satisfaction with ICT	3
Challenges in Education	
Main challenges in education	2
Active learning	1
Homework	3
Assessment	1

<i>Variables</i>	<i>Number of Items</i>
Perception of the Teaching Profession	
Social Status	1
Assessment	1
Motivation	1

### Procedure and Data Analysis

The online questionnaire was distributed by BlinkLearning to all their digital education platform users and by the URJC. The procedures of this study were approved by the University Research Ethics Committee (approval number 2404201708817) and informed consent was obtained from all participants in the study, thus guaranteeing data protection. The data was collected online in May 2017.

Survey data were analyzed using descriptive and inferential statistic methods, such as frequency analysis, t-tests, chi-square, and Fisher’s exact tests to determine possible differences among the opinions of the teachers. The data were analyzed using IBM SPSS Statistics (Version 26), and the qualitative data of the open-ended responses were classified into categories and study variables.

## Results

The results are organized into two sections with three categories: technology in the classroom, challenges in education, and perception of the teaching profession. The analysis of results is carried out from both quantitative and qualitative points of views. The most significant results for the study are presented below.

### From a Quantitative Point of View

#### *Technology in the Classroom*

As a general trend, it can be observed that most of the participating teachers used ICT in their classes on a daily basis ( $n = 623$ ; 67%) or several times a week ( $n = 222$ ; 23.9%). Specifically, the overall percentage was higher in some countries such as Spain (68.9% and 22.9%) and Chile (60% and 30%), while it was lower in Peru (50% and 10%) and Mexico (40.9% and 43.2%).

In almost all schools there were 1:1 projects in which every student had their own digital device ( $n = 923$ ;  $M = 2.44$ ;  $SD = 1.50$ ). Schools in Mexico ( $M = 3.02$ ;  $SD = 1.68$ ) and Peru ( $M = 2.90$ ;  $SD = 1.60$ ) are noteworthy as they have implemented the most 1:1 projects in their classes (1 = none; 2 = one or two; 3 = between three to six; 4 = between seven to ten; 5 = more than ten), followed by Spain ( $n = 827$ ;  $M = 2.39$ ;  $SD = 1.48$ ) and Chile ( $1.70$ ;  $SD = 1.49$ ). The most used devices are listed in Table 3. Furthermore, the results of the students’ t-test showed significant differences between Spain and Mexico ( $t(869) = 2.74$ ,  $p = 0.006$ ) in the implementation of 1:1 projects.

Table 3: Devices Most Used by Students

<i>Devices</i>	<i>n</i>	<i>Percentage</i>	<i>Percentage of Cases</i>
Laptops/PCs	574	32.2%	61.7%
Interactive whiteboards/projectors	549	30.8%	59.4%
Mobile phones	261	14.6%	28.2%
iPads	201	11.3%	21.8%
Android tablets	127	7.1%	13.7%
Windows tablets	34	1.9%	3.7%
Chromebook tablets	32	1.8%	3.5%
Other devices	7	0.4%	0.8%

Regarding the use of devices such as tablets for learning content, 65.4 percent of participants ( $n = 608$ ) indicated that using them “enhances performance in self-study,” 25.1 percent ( $n = 233$ ) think that “they do not add much more than a textbook, especially in self-study,” and 6.1 percent ( $n = 57$ ) believe that “they are an obstacle to the intellectual effort required in studying.” On the other hand, the three main challenges that most teachers had in implementing technology in the classroom prior to the pandemic were issues linked to connectivity (61.2%), teacher training (46.0%), and lack of devices (43.5%). They also signaled the lack of available time to train on ICT (31.1%). Furthermore, more than 71 percent of them had received ICT training from their school, but 31.1 percent believed it was not enough. Most teachers (75.4%) stated that the area they most need training in is using apps, software, or digital platforms.

Concerning their self-assessment of their general digital level in each of the five digital competences areas (see INTEF 2017 for the descriptors of the proficiency levels), results show that teachers perceived they have a higher level in the area of “communication and collaboration” ( $M = 7.62$ ;  $SD = 1.70$ ), in “problem solving” ( $M = 6.75$ ;  $SD = 2.10$ ), “safety” ( $M = 6.60$ ;  $SD = 2.05$ ), “information and data literacy” ( $M = 6.54$ ;  $SD = 2.46$ ), and “digital content creation” ( $M = 6.37$ ;  $SD = 2.35$ ). Moreover, the self-assessment of teachers in Mexico was higher in each competence area, and these differences were statistically significant ( $p < 0.001$ ) except for the “information and data literacy” area.

We found also that 93.1 percent of teachers believed that the educational technology introduced into their classrooms met learning objectives, but almost 50 percent thought they partially did. In addition, most of teachers thought there was a high (60.9%) or very high (22.7%) relationship between technology use and increased motivation in students to learn, mainly due to the capacity of ICT in providing autonomy, student digital connectivity, and creativity. Ratings were not significant different between Spain ( $M = 3.89$ ;  $SD = 1.01$ ) and Mexico ( $M = 3.91$ ;  $SD = 1.07$ ), and only 7.1 percent of the teachers thought there was no link between technology and motivation. According to most teachers, using ICT in the classroom provides not only benefits for students, such as a greater content and resources accessibility, higher motivation, and better preparation for their future working lives), but also for teachers as it enables them to develop their

professional digital competence, improve teacher-student communication, create a more personalized learning environment, and stay informed of students' current needs.

Results also showed that most teachers used collaborative tools and resources such as Google Classroom and other online platforms (75.6%), classroom management tools (57.4%), and audiovisual creation tools (51.3%). Furthermore, 79.6 percent of teachers believed that it was necessary to include new courses that enhance student digital competence, but as some teachers (23.5%) suggested, these should not be compulsory. On the other hand, a total of 90.9 percent of teachers recommended implementing digital projects in schools, and no association between countries was found.

The results further indicate that teachers were satisfied with the integration of ICT at their schools ( $M = 3.09$ ;  $SD = 1.76$ ). Although teachers in Mexico ( $M = 3.35$ ;  $SD = 1.67$ ) seemed to be a little more satisfied than those from Spain ( $M = 3.11$ ;  $SD = 1.75$ ), no significant differences were found ( $p > 0.5$ ). Additionally, only a few teachers (15.2%) were aware of schools where technology was being successfully implemented, and no significant differences were found either.

### *Challenges in Education*

When questioned about the main challenges facing education before the pandemic the participating teachers stated the following: achieving greater student motivation (56.6%), reaching a consensus in educational policies (37.5%), reducing class sizes (31.9%), improving teacher training (31%), increasing the access to more and better educational resources, such as digital resources (26.2%), and improving the pedagogical integration of ICT (25.6%). On the other hand, the majority of teachers reported the following three academic deficits in students: reading comprehension (69.4%), difficulty in applying what they have learned in other settings (58.1%), and independent learning (52.1%). Furthermore, the active learning methods used by most teachers are collaborative learning (79.8%) and project-based learning (50.5%). However, some teachers also implemented independent learning (44.3%) and learning competency-based learning (41.6%) among others.

Regarding homework, only 17.8 percent of participating teachers did not support homework assignments. However, some teachers (38%) believed that homework can help students develop good study habits and foster independent learning; other teachers (34.2%) thought that homework can reinforce the content and skills taught in the classroom. The chi-square test shows that there was a statistical significance difference between the responses of teachers in Spain and Mexico ( $X^2(2) = 10.009$ ,  $p = 0.007$ ), as 32.5 percent of teachers in Mexico did not support homework assignments compared to 16 percent of teachers in Spain. However, the Cramer's V turns out to be 0.116, indicating a small (or "weak") association. On the other hand, most participating teachers (57.6%) believed that personalizing homework assignments is important, and 27.8 percent of the participants pointed out that tablets can help in tailoring homework based on student performance.



Concerning assessment, although the majority of teachers (61.3%) frequently used objective tests as they typically take less time and effort for teachers to develop, 57.4 percent of teachers also used essay and written tests that take much longer to score. Additionally, results showed that teachers have students engaged in their own learning through self (47.9%) and peer assessment (36.7%).

#### *Perception of the Teaching Profession*

Regarding the social status of the teaching profession, 57.1 percent of the teachers believed that their work was valued by society. However, some teachers thought that their profession was not valued highly enough, and 42.9 percent reported that it was not valued at all. Despite this, it seems that teachers in Spain have a higher perception as valued professionals, as shown by the statistically significant association found in the Fisher's exact test ( $p = 0.037$ ).

Additionally, 47.1 percent of teachers believed that teacher assessment and evaluation should be based on both qualitative and quantitative evidence of teaching and learning outcomes accomplishment. However, 24.6 percent believed that this assessment should be based solely on qualitative evidence and 14.9 percent thought it should be based on project-based assessments. No statistically significant difference was found between Spain and Mexico ( $p > 0.05$ ), but 4.3 percent of teachers in Spain considered that their work should not be assessed.

Regarding the satisfaction and motivation of teachers, no significant differences were observed between the countries. Although results showed that most teachers (55.5%) love their job, they sometimes lack motivation. In fact, as 41.6 percent of them pointed out, their motivation has changed over the course of their career, and they were less motivated than when entering their professional career.

#### *From a Qualitative Point of View*

This section presents the most representative data from the open-ended question. The analysis of the voluntary comments for this question consisted of classifying them according to the categories and variables of the study and finding out their frequency. The category "Technology in the Classroom" was the most recurrent, followed by "Challenges of Education" and, finally, "Perception of the Teaching Profession." The most representative testimonies by category are as follows.

#### *Technology in the Classroom*

Regarding the use of ICT in the classroom, teachers showed some concerns regarding the use of digital resources. As some teachers stated that "No todos los estudiantes tienen en casa conexión a internet" [Not all students have an internet connection at home] and "Si no hay dispositivos para poder utilizar la formación no sirve para nada" [If there are no devices to use for training purposes, it is useless]. Moreover, other teachers highlighted the potential use of ICT as "Hay muchas ventajas, pero la carga lectiva y los exámenes de selectividad en algunos

“cursos te limitan el poder hacer más cosas” [There are many advantages but the academic workload and the competitive tests prevent you doing more] and enhances their job since “Está claro que facilita la tarea al profesor, pero hasta que se observan avances y se obtienen beneficios el proceso es largo y laborioso” [It is clear that it makes the job easier for the teacher, but the process leading to advances and benefits process is long and laborious].

However, there are also some disadvantages since it was sometimes not easy for teachers to access online learning platforms as one of them stated “Me resulta difícil acceder a las plataformas” [It is difficult for me to access platforms], or it even appears that the use of ICT leads to a more surface learning as another participant pointed out “Aprendizaje más superficial en cuanto a la profundización en los temas, también menos reflexivo” [More superficial learning in terms of depth of knowledge, also less reflective].

### *Challenges in Education*

Although some teaching strategies promote active learning in the classroom, one participant noted that “No es posible la aplicación de metodologías activas en las actuales circunstancias de ratios, horas y recursos” [It is not possible to apply active learning under the current conditions of student-teacher ratios, scheduling, and resources]. Moreover, it seems that teachers need to learn how to implement active learning successfully in class so they can perceive it as a tool that enhances student learning and not a waste of time as a participant noted: “No son más que excusas para no dar clase y no explicar la materia” [It is little more than an excuse to not teach and not explain the material].

On the other hand, it seems that the debate over homework rages on. Although the benefits of homework have been disputed and some teachers believed that homework “Conviene, pero sin comprometer demasiado tiempo libre del alumno y/o familia” [...is useful, but it shouldn't take up too much of the student's and/or family's free time], some of them pointed out that homework should be implemented “No como norma, sí como necesidad” [Not as a rule, but as a necessity]. In fact, some teachers were in favor of homework to reinforce learning and to encourage responsible habits and self-study as one of the teachers stated: “Sí, como refuerzo de lo aprendido, pero no como sustitución del estudio ni en cantidad excesiva” [Yes, to reinforce class work but not as a substitute for study or in excessive quantity]. However, as another participant noted “Hay que limitar al máximo los deberes que se mandan para casa. El trabajo se hace en el trabajo” [You have to limit homework assignments. Work is done at work]. Schools should limit homework, and it should be the result of collaborative efforts to improve student learning, as another teacher suggested: “Sí a los deberes de forma racional coordinados por el equipo educativo” [Yes to coordinated rational homework by the teaching team]. In contrast, some schools seem to have adopted no-homework policies as another teacher noted: “El departamento, no yo personalmente, tiene especificado no mandar deberes” [The department, but not me personally, has a rule on not assigning homework].

*Perception of the Teaching Profession*

Regarding assessment and evaluation, it is essential not only to have teacher evaluations since “El trabajo del profesor de hoy es desbordante” [Teachers’ work is overwhelming nowadays], but also as one teacher noted “Primero hay que evaluar el sistema educativo” [The education system needs to be assessed first] and “Debe evaluarse y debe exigirse más a alumnos, padres y legisladores” [It must be assessed and must be demanded more from students, parents, and legislators].

**Discussion and Conclusion**

This study analyzes the perception of the use of ICT and of other challenges in education before the digital transformation during the COVID-19 pandemic. Firstly, the results reveal a high level of teachers’ engagement in using ICT in the classroom prior to the pandemic. In fact, the teachers who have implemented more 1:1 projects in countries such as Mexico, Peru, and Spain have their own digital devices, with laptops the most widely used. In addition, it seems that tablets are less frequently used in projects, but they are more manageable and facilitate access to applications (Arancibia Muñoz, Cabero Almenara, and Valdivia Zamorano 2019; Schnackengerg 2013).

On the other hand, there is also a noticeable majority of teachers who complained of the lack of mobile devices in the classroom and connectivity problems in their schools, as reported also in the study by Anna Escofet et al. (2019). This lack of digital investment is one of the main barriers to implement ICT in the classroom (Martínez-Rodrigo, Martínez-Cabeza Jiménez, and Martínez-Cabeza Lombardo 2019; Sánchez-Prieto, Olmos Migueláñez, and García-Peñalvo 2017), alongside insufficient teacher technological training (Colás-Bravo, Conde-Jiménez, and Reyes-de-Cózar 2019; Gairín Sallán, Castro Ceacero, and Mercader Juan 2017; Gomez Zermeño and Eligio Mendoza 2022; IESALC 2020). However, as the European Commission (2020) recommends in the “Digital Education Action Plan,” countries need to provide a more impact-focused investment in digital education and teacher training to be more efficient. Although we observe that teachers positively self-assess their level of digital competence in each of the INTEF framework (2017) areas, they recognize there is a lot to be improved despite their preparation since they lack training (Colás-Bravo, Conde-Jiménez, and Reyes-de-Cózar 2019; Beltrán-Sánchez et al. 2019), especially in the use of specific software. In fact, the European Commission (2023) is calling for an improvement in the digital skills teaching and training of prospective teachers since it has become more apparent since the COVID-19 pandemic.

One of the highest rated digital competence areas was “communication and collaboration,” which is also of great importance in other similar studies (Domingo-Coscollola et al. 2020; Engen 2019). Our research reveals that teachers’ perceptions of digital competence differs among countries, being higher rated by teachers in Mexico. Additionally, it seems there is a positive association between the use of technology and the motivation of students, as it engages students in the learning process, as reported in other studies as well (Gairín Sallán, Castro Ceacero, and Mercader Juan 2017; Paz-Albo 2014).

Regarding teacher challenges in education, most participants agree that motivating students is the major challenge for schools, but they also indicated a need for reducing class sizes and an increased investment in technology and teacher training (Gairín Sallán, Castro Ceacero, and Mercader Juan 2017; Rodríguez-Jiménez, Gómez-García, and Romero-Rodríguez 2019). These challenges may refer to the teachers' perceptions of the difficulties presented to students' autonomous learning, especially in online environments (Fernández Manjón, Martínez Ortiz, and Calvo Morata 2020). Although teachers promote collaborative learning and project-based learning approaches, it is essential to incorporate meaningful and active learning activities to engage students in the classroom (Gairín Sallán, Castro Ceacero, and Mercader Juan 2017; Inchaouh and Tchaïcha 2020). On the other hand, the results concerning teachers' perceptions of school homework confirm previous findings (Consejo Escolar de la Comunidad de Madrid [School Council of the Community of Madrid] 2017) and show that a small percentage of teachers in Spain feel that homework is not necessary.

Finally, it is observed that teachers perceive a dissociation concerning the social status that society assigns to the teaching profession. Understanding the disparity in opinions among teachers may help boost the social prestige of teaching careers, as noted by Begoña Zamora Fortuny and Leopoldo Cabrera Rodríguez (2015). Moreover, participating teachers believe that teacher assessment and evaluation should be based on a combination of qualitative and quantitative data to improve the learning processes. In fact, teacher assessment and evaluation may also influence the teachers' motivation and satisfaction levels. Based on the data, the significance of teacher motivation is evident and has an important role in professional success (Larrosa Martínez 2010).

As a final conclusion, this study has explored teachers' views about the use of technology before the COVID-19 digital transformation, identifying a lack of ICT resources and teacher training before the emergency remote teaching. These results coincide with some resistance found in Cristina Mercader's study (2019) before the pandemic. Moreover, it is essential that initial future teacher preparation programs update their training for the coming generation of teachers, as noted in other studies (Castellanos Sánchez, Sánchez Romero, and Calderero Hernández 2017; European Commission 2023; Gómez-Gómez 2021). In this context, as Jesús López Belmonte et al. (2019) pointed out, it is necessary to have education professionals committed to the inclusion of technology and who act as technological leaders in the classroom.

This study has several strengths but is not without limitations. First, we acknowledge the reduced number of participants from some countries since larger samples provide greater confidence. A critical direction for future research is to replicate this study with a large sample of non-Spanish speaking countries, although as María Pilar Colás-Bravo (2021) points out the connection between Spanish speaking countries is an opportunity for research and progress in what the author terms contextualized scientific educational knowledge. A second limitation concerns the exploratory nature of the study just before the onset of the COVID-19 pandemic.

Therefore, further research is needed in order to understand the impact and relevance of the use of ICTs in the current teaching-learning process to digitally transform the education and training systems.

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## Informed Consent

The authors have obtained informed consent from all participants.

## Conflict of Interest

The authors have no conflicts of interest to declare.

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