



## Teacher's perspective in a challenging pandemic scenario

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### ABSTRACT

This paper aims to understand higher education teachers' perspectives facing the necessity to adopt a full online learning methodology brought by the COVID-19 pandemic situation. For this, we carried out a quantitative study by means of an online survey of professors at a medium-sized Spanish university with a staff of around 2,700 teachers, belonging to different categories and areas of knowledge. The aspects dealt with were a) the tools used for teaching and evaluation, b) the perception of the teacher's previous preparation, c) the personal assessment of the work carried out, and d) the limitations observed in the development of teaching activity. The main conclusions include the high number of teachers who had never taught online, the feeling of unease when facing an unknown scenario, the excessive stress derived from the need to transfer teaching to an unknown scenario, the excessive use of transmission of contents via virtual campus, the perception of ICT as mere assistants of the teaching-learning process or the excessive concern for plagiarism linked to the evaluation via exam.

Key words: Teachers; Educational resources; University; E-learning, COVID-19

## La perspectiva del profesorado en un escenario de pandemia desafiante

### RESUMEN

Este trabajo pretende conocer las perspectivas del profesorado de educación superior ante la necesidad de adoptar una metodología de aprendizaje totalmente online que conlleva la situación de pandemia de COVID-19. Para ello, realizamos un estudio cuantitativo mediante una encuesta online a profesores de una universidad española de tamaño medio, dotada de una plantilla de alrededor de 2700 profesores, pertenecientes a diferentes categorías y áreas de conocimiento. Los aspectos tratados fueron, a) las herramientas utilizadas para la enseñanza y la evaluación, b) la percepción de la preparación previa del profesor, c) la valoración personal del trabajo realizado, y d) las limitaciones observadas en el desarrollo de la actividad docente.

Entre las principales conclusiones destacan el elevado número de profesores que nunca habían impartido docencia en línea, la sensación de desasosiego ante un escenario desconocido, el excesivo estrés derivado de la necesidad de trasladar la docencia a un escenario desconocido, el excesivo uso de la transmisión de contenidos a través del campus virtual, la percepción de las TIC como meros ayudantes del proceso de enseñanza-aprendizaje o la excesiva preocupación por el plagio vinculada a la evaluación vía examen.

Palabras clave: Profesores; recursos educativos; universidad; e-learning, COVID-19

ISSN: 0210-2773

DOI: <https://doi.org/10.17811/rifie.52.2.2022.181-190>



## Introduction

The serious health crisis that began in 2020 forced higher education institutions to adapt abruptly to an unfamiliar situation, forcing them to work hard on the redesign of subjects, forms of assessment and the use of ICT, among other aspects. This justifies the large amount of research focused on studying the impact of the pandemic on teaching, together with the recommendations made by various international organisations on the best way to deal with this transition. For its part, the Ministry of Universities drew up a document of recommendations to the governing teams of Spanish universities, with the aim of coordinating the measures to be adopted to enable the transition to an online learning environment, capable of responding to the emergency. The follow-up of this report by most of the universities leads to the conclusion that there is a certain level of similarity in the measures adopted (Area-Moreira et al., 2021).

The declaration of the state of alarm and the consequent confinement of the population meant that teachers who were accustomed to face-to-face teaching exclusively had to abruptly face a major methodological change (Barbosa and Amariles, 2019; Cecilio-Fernandes et al., 2020; Sánchez et al., 2020), without, in many cases, having the appropriate training or the necessary pedagogical and infrastructural conditions to do so (Bozkurt and Sharma, 2020; García-Peñalvo et al., 2020 and Muller and Goldenber, 2020). Such a transition has been called “emergency remote learning” (Hodges et al., 2020) or “face-to-face blackout” (Llorens-Largo, 2020).

The move to online teaching, forced by the circumstances arising from the pandemic, obviated the lengthy processes of training, redesign of subjects and infrastructures required by e-learning (González-Calvo et al., 2020). The methodological characteristics of virtual education differ from face-to-face education, so institutions must approach both modalities with different pedagogical strategies (Díaz-Guillen et al., 2021).

Before continuing, we must clarify what is meant by distance learning, online learning, or *e-learning* (equivalent terms in the scientific literature). We could say that we are dealing with teaching that takes place outside the classroom, supported using ICT, which attributes greater autonomy and give priority to the student and which allows for more flexible time management adapted to each situation (Vlachopoulos and Makri, 2019; Díaz-Guillen et al., 2021). This teaching modality requires certain key competences for its correct development; in the words of Marciniak (2015) pedagogical, technical, and didactic, to which Cabero-Almenara and Llorente-Cejudo (2020) add affective, emotional, and social; or those identified by Garrison and Anderson (2010): cognitive, social, and teaching.

In short, the implementation of hybrid teaching models should be sought, i.e., developing online learning models but with elements that allows the supervision and monitoring the student located in a different physical location (Horn and Staker, 2014). In this type of hybrid model, the learning process of each student, and in each subject, would have to be connected to provide an integrated learning experience.

Regarding this, it is noteworthy that the transition from face-to-face to online teaching requires far-reaching changes, which can hardly be carried out in a very short time even facing emergency situations, such as the generated by COVID-19 (Cervantes and Gutiérrez, 2020), that was characterised by great confusion and stress among educational agents who, little by little, adopted palliative measures to deal with this sit-

uation: reorganisation of teaching planning and articulation of real-time video-calling systems to enable synchronous contact between teachers and students (Area-Moreira et al., 2020; Roig-Vila et al., 2021).

Far from generating an adequate transition, the changes have remained an effort to generate digital content from the traditional approach, which has not been able to take full advantage of ICT tools, nor, of course, to reach students in an adequate way. All this even though the pandemic breaks out years after the change of paradigm promoted through the European Higher Education Area, which implies a comprehensive transformation of the teaching methodology, based on a change in the roles of the actors involved in the teaching-learning process (Fernández-Regueira et al., 2020).

The absence of a holistic strategy in the university means that “the crisis generated by Covid-19 brings to light structural and organisational deficiencies that are far from being the product of a health crisis but have been brewing in the university system for decades” (Fernández-Regueira et al., 2020, p. 21).

## Objectives

Based on this approach, the work we propose aims to find out how teachers have experienced the adaptation to “emergency remote teaching”. More specifically, we aim to find out the level of adaptation of teachers, the tools used for teaching and their perception of the process of change. Furthermore, we believe it is important to shed light on whether university teaching staff are really prepared to face a possible transition towards hybrid teaching models, both virtual and physical, as we indicated above; that is, whether they are conceiving the change from a holistic point of view, capable of conceiving the didactic aspects, or whether they are only making use of ICT in a short-term way and as mere tools to get by. We will also try to study possible differences between the perception of teachers belonging to different groups according to the stratification of the sample.

## Methodology

To achieve our objectives, we have developed a two-phase investigation (mixed research). The first followed a qualitative approach and relied on in-depth interviews as a tool that allowed us to gather information that would help us to define the questionnaire used for the quantitative part of the work. Fifteen interviews were conducted with teachers of different Universities of Spain, divided equally between the five main areas of knowledge: arts and humanities\_AH, sciences\_S, health sciences\_HS, social and legal sciences\_SLS and architecture and engineering\_AE. The respondents were also distributed among the different professional categories, namely: 2 full University Professors (coded as CAUN), 6 University Professors (coded as PTUN), 2 full University College Professors (coded as PTEU), 2 full-time employees (LABTC) and 3 part-time employees (LABTP). We used MAXQDA software to carry out the content analysis.

The second part consisted of a quantitative study, based on the information collected through a questionnaire administered to the teaching staff of a medium-sized Spanish University, with a staff of 2747 teachers during the 2019/20 academic year. According to the population size of 2747 teachers, the maximum error to be assumed and the level of confidence chosen (all the details in table 1), the size of the sample with which we worked with was 337 teachers. The technical details of the survey are shown in table 1.

Table 1  
Survey fact sheet

CHARACTERISTICS	
Sample element	Teacher
Sampling procedure	MAE in PA by category, branch and gender
Sample size	337 individuals
Sampling error	±5%
Level of confidence	95%
Weather	November-December, 2020
Source of information	Online survey

The sample was distributed in proportion to the population representation of teachers by sex, area of knowledge and professional category; table 2 shows the distribution.

For the quantitative analysis, as well as for the validation of the measurement scales, we used the SPSS-26 software. For the validation of the scales, we used the factor analysis of principal components. For the study of the reliability, we used the Cronbach's alpha and the total item correlation coefficient. Finally, analysis of the data itself was performed with frequency analysis, ANOVA, difference of means and Tuckey and Bonferroni tests.

**Variables and measurements**

**Variables used**

Several categories were identified from the interviews carried out with the teachers, that allowed us to define several items of the questionnaire, such as the teacher's preparation in ICT and in didactic, elements of online teaching, the tools used, the resources generated or personal experience, among others. The final questionnaire was made up of quantitative variables (measured on Likert scales) and qualitative variables, which were used to collect the classification data. A first group of items, measured on a five-position Likert scale, tried to analyze the teacher's perception of their preparation to face an e-learning scenario. A second group addressed aspects related to the teacher's experience in the pandemic period. Finally, we measure the perception that

the teacher has about online and offline teaching. In both cases we also use five-position Likert scales.

**Scale validation**

For the validation of the scales, we resorted to Exploratory Factor Analysis (EFA), specifically, Principal Axis Analysis with Varimax Rotation for each group of variables considered. Before proceeding to their application, we checked that the correlation between them is above .5 and that the Bartlett's Test of Sphericity is significant.

First, we carry out an AFE for the items measuring the teachers' assessment of their readiness to take on online teaching. Bartlett's test yields a value of  $\chi^2(55)=658.758$ ; ( $p=.000$ ) and the KMO index of .775, which allows us to conclude that the use of the PFA is adequate. The AFE yields two factors; the first one represents the teacher's perception of his/her technological preparation to cope with online classes (PREP\_TIC) and the second one (INTER\_ADAPTA) refers to his/her ability to foster interaction with the student and to adapt to the situation.

We conducted a second AFE for the items measuring the teacher's perception of their educational experience during the pandemic. We also found that the correlations, as well as Bartlett's test  $-\chi^2(55)=589.458$  ( $p=.000$ ) and the KMO index value .815, were significant, thus proving the relevance of the application of the PFA. The information is grouped into four factors. The first one includes aspects related to the confusion experienced, together with the improvisation with which the teaching was approached (DESC\_IMPROV). The second brings together questions relating to perceived deficiencies in the quality of the teaching given (CAL\_PERC). The third refers to urgency in the training received for online teaching, as well as in the assimilation of content (PREM\_FORM). The fourth includes aspects that measure the teacher's level of stress and its causes (NIV\_ESTRES).

Finally, we analysed teachers' perceptions of online and offline teaching. We found that the correlations, Bartlett's test  $-\chi^2(55)=692.327$  ( $p=0.000$ ) and the KMO index .704, are significant, so that the use of the PFA is relevant. In this case, two factors are obtained, one encompassing the items relating to the requirements of virtual teaching (REQ\_VIRTDIC) and the other integrating the elements relating to the commitment to traditional teaching (DOC\_TRAD). Table 3 shows all the results.

Table 2  
Strata sample

	CAUN		PTUN		PTEU		LABTC		LABTP		TOTAL SEX		TOTAL BRANCH OF KNOWLEDGE	
	M	H	M	H	M	H	M	H	M	H	M	H		
AH	2	4	10	8	1	0	5	3	8	4	26	18	44	
SLS	2	6	14	15	6	4	15	9	19	24	56	58	114	
S	4	8	8	13	1	1	2	2	2	2	16	26	42	
AE	1	6	6	20	1	5	2	7	2	8	13	47	60	
HS	1	3	3	4	0	0	3	1	40	22	47	30	77	
TOTAL CATHEGORY	37		101		19		49		131		158		179	337

Table 3  
Exploratory Factor Analysis

Factor	Variables	Weights	% var explained	%var accumulated
Teachers' assessment of their preparation for online teaching				
Adequate ICT preparedness (PREP_TIC)	I felt technologically prepared for online teaching.	.711	27.676	27.676
	I consider myself a great connoisseur of ICTs.	.804		
	My knowledge of the digital tools offered by the virtual campus before the pandemic was high.	.645		
	I am very active in web 2.0	.606		
Interaction and Adaptation (INTER_ADAPTA)	I felt prepared to dynamise the virtual classroom.	.760	24.273	51.949
	I felt prepared to tackle online teaching from a didactic approach.	.716		
	My approach to online teaching has been holistic by adapting it from a different pedagogical approach to face-to-face teaching.	.604		
	I have felt able to encourage student participation.	.842		
	I have been creative in adapting the activities to be developed	.814		
Teacher experience during the pandemic				
Bewilderment and improvisation (DESC_IMPROV)	I have found it difficult to redesign my subjects	.760	28.002	28.002
	I have not had the time to assimilate the teaching change.	.887		
	I have felt lost due to lack of guidelines for adapting the teaching	.814		
	I have not had the time to develop the right materials.	.752		
Deficiencies in the teaching quality (CAL_PERC)	The adaptive teaching measures I have implemented have been improvised, in response to the situation.	.687	21.301	49.303
	It is not clear to me whether I have succeeded in providing quality training.	.723		
	The quality of my teaching has been affected by my limited use of ICTs.	.737		
	The application of the training received in the classroom has not been adequate due to its haste.	.772		
Stress level (STRESS_LEVEL)	I felt a sense of stress due to the unfamiliarity of the situation.	.689	17.105	66.408
	I felt a sense of stress due to the time needed to prepare the lessons.	.814		
	I felt a sense of stress about possible connection problems.	.887		
Urgency in the training (PREM_FOR)	The training courses received have been highly concentrated.	.775	9.502	75.910
	I have been overwhelmed by the number of training courses I have received.	.804		
	I have not had time to assimilate the online training I have received.	.699		
Perceptions of online and offline teaching				
Requirements of the virtual learning (REQ_VIRTDIC)	E-learning requires...		37.112	37.112
	...specific ICT training	.715		
	...a different kind of didactic preparation	.807		
	...a specific didactic model	.741		
Commitment to the teaching traditional (DOC_TRAD)	Face-to-face teaching is irreplaceable	.623	23.450	60.562
	I have tried to respect my face-to-face teaching schedule as much as possible.	.789		
	I see ICT as a complementary tool to help the classroom.	.698		
	I have mainly transferred the contents of the face-to-face class to the virtual platform.	.752		
	I am committed to a methodology based on the transmission of knowledge.	.801		

Once the validity of the scales has been analysed, it is time to study their reliability. We used Cronbach's  $\alpha$ , an indicator that requires a value above 0.7 to consider the scale reliable, and the Total Item Correlation Coefficient, whose value must be above 0.3. Table 4 shows the results, indicating that the scales are reliable.

## Results

Before going through the obtained results, we believe it necessary to point out that we are dealing with the opinion of the teachers, which does not have to respond to the assessment of other groups in the university community, such as students.

Table 4  
Reliability of scales

Construct name	Construct measure	Cor. item total	Media	Standard Deviation
Teachers' assessment of their preparation for online teaching				
Adequate ICT preparedness (PREP_TIC) $\alpha = .802$	I felt technologically prepared for online teaching.	.67	1.98	1.36
	I consider myself a great connoisseur of ICTs.	.64	2.01	1.32
	My knowledge of the digital tools of the virtual campus before the pandemic was high.	.59	2.08	1.43
	I am very active in web 2.0	.56	1.72	.88
Interaction and Adaptation (INTER_ADAPTA) $\alpha = .751$	I felt prepared to dynamize the virtual classroom.	.45	2.20	1.32
	I felt prepared to tackle online teaching from a didactic approach.	.42	2.44	1.45
	My approach to online teaching has been holistic, adapting it to ICTs from a different pedagogical approach to face-to-face teaching.	.43	1.75	.80
	I have felt able to encourage student participation.	.39	2.20	1.82
	I have been creative in adapting the activities to be developed	.36	1.92	1.35
Teacher experience				
Confusion and improvisation (DESC_IMPROV) $\alpha = .771$	I have found it difficult to redesign subjects	.49	3.07	1.40
	I have not had the time to assimilate the teaching change.	.61	4.33	.84
	I have felt lost due to lack of guidelines for adapting the teaching	.58	4.13	1.07
	I have not had the time to develop the right materials.	.58	4.30	0.52
Shortcomings in teaching quality (CAL_PERC) $\alpha = .705$	The adaptive teaching measures I have implemented have been improvised, in response to the situation.	.60	4.04	1.01
	It is not clear to me whether I have succeeded in providing quality training.	.67	3.48	1.63
	The quality of my teaching has been affected by my limited use of ICTs.	.62	3.51	1.49
	The application of the training received in the classroom has not been adequate due to its haste.	.56	3.62	1.39
Stress level (STRESS_LEVEL) $\alpha = .723$	I felt a sense of stress...			
	...due to the unfamiliarity of the situation	.65	4.22	.87
	...for the time needed to prepare the classes	.62	3.50	1.65
	...because of possible connection problems	.48	3.11	1.71
Urgency in training (PREM_FOR) $\alpha = .730$	The training courses have been highly concentrated	.47	3.23	1.62
	I have been overwhelmed by the amount of courses I have received.	.39	3.30	1.67
	I have not had time to assimilate the training	.41	3.63	1.27
Perceptions of online and offline teaching				
E-learning requirements (REQ_VIRTDIC) $\alpha = .762$	E-learning...			
	...requires specific training in ICTs	.49	4.31	.58
	...requires a different kind of didactic preparation	.61	4.03	.98
	...requires a specific didactic model	.58	3.97	1.05
Commitment to traditional teaching (DOC_TRAD) $\alpha = .789$	Face-to-face teaching is irreplaceable	.60	3.61	1.42
	I have tried to respect my face-to-face teaching schedule as much as possible.	.67	4.12	.89
	ICTs are a complementary tool to the classroom.	.63	3.79	.92
	I have mainly transferred the contents taught in the classroom to the virtual platform.	.58	4.02	.84
	I am committed to a teaching methodology based on the transmission of knowledge.	.56	3.77	1.05

### Online teaching model and use of digital tools

We began by asking teachers whether, prior to the pandemic, they had received online training and whether they had taught online. The results revealed that most had received online training, although only a small percentage had taught online. On the other hand, we tried to take a snapshot of the teaching model used and did not find a clearly leading one, although tutorials on student demand offer the greatest value. In this sense, we refer to a teaching model, to avoid establishing differentiations in teaching processes, and to avoid making the analysis more complex. We study action frameworks, not specific mechanisms (methods, teaching techniques, practices, among others). As for the use of digital tools for teaching, the results reveal that the most used were email contacts, internships via the virtual campus and shared documents. The data can be consulted in table 5.

To find out the teachers' perception of assessment, we asked about the type of tools used and the degree of concern about its application. The majority of the inquired teachers, 90.2%, refer that they used the traditional exam, some of them, 32.4% used the exam in combination with individual work, and 24.2% refer that they used it in conjunction with group work. With less expression, 17.4%, are those that combine the three tools.

Teachers expressed great concern about the management of exams that students had to take, especially about not being able to control plagiarism adequately and about possible system or connection failures. Data show that these issues were of great

concern for more than 85% of the teachers in the first case and more than 96% in the second.

### Teacher's perception and experience of teaching in the period of confinement

We observe that the preparation in ICT applied to the classroom, with which the teachers faced *e-learning*, is low in most cases. The ability to dynamize the classroom and the relationship with the student improves a little, although the values found are low, as shown in table 10. This is complicated to a large extent if we consider that we are starting from a teaching staff that is not used to this scenario, proof of which is that most of them have never taught online before the pandemic (more than 70%) and a similar percentage have not made use of online teaching resources of any kind.

On the other hand, the general perception of the teacher is one of uncertainty regarding the quality of the teaching given, due, on the one hand, to factors such as the lack of guidelines on how to proceed, the urgency of the situation and its effects on the quality of the materials used and, on the other hand, to deficiencies in teacher training to face a scenario to which they are not accustomed. This is despite the number of courses that have come to overwhelm teachers due to their concentration in time and the urgency of applying the knowledge. In addition, there is a high level of stress.

Finally, in relation to the teacher's perception of online and face-to-face teaching, they understand that *e-learning* requires

Table 5  
Frequencies and descriptions of online teaching received and delivered, use of teaching models and tools

Model	Frequencies %			Media	DE
	1 Never	2 Occasional	3 Continued		
Online training received	41.5	25.2	33.3	1.91	.74
Online training provided	66.2	31.8	2.0	1.35	.27
Model	Frequencies %			Media	DE
	1 Never	2 Occasional	3 Continued		
Presentation and asynchronous interaction	13.1	68	18.9	2.05	.31
Presentation and synchronous interaction	9.8	67.5	22.8	2.13	.30
Presentation without interaction	20.3	48.8	30.9	2.10	.50
Tutoring on demand	12.3	46.7	41.1	2.29	.44
Group tutorials	35.2	41	23.8	1.88	.57
No online classes	18.9	59.8	21.4	2.02	.40
Tool	Frequencies %			Media	DE
	1 Never	2 Occasional	3 Continued		
Teacher video tutorials	23.8	59.8	16.4	1.92	.39
Video tutorials from others	67.2	27.9	4.9	1.37	.33
Teachers' blog	76.1	19.8	4.1	1.28	.28
Videoconferencing	8.9	58.1	33	2.24	.36
Forums	23	50.8	26.2	2.03	.48
Social media	76.7	20.8	2.5	1.25	.23
Moodle Internships	6.5	41.9	51.6	2.45	.37
Shared documents	16.4	38.5	45.1	2.28	.53
Contact by e-mail	2.9	20.3	76.8	2.73	.25

specific knowledge and skills, not only in ICT, but also in didactic aspects that make it possible to develop a comprehensive and coherent model. On the other hand, there is a commitment to face-to-face teaching, in which teachers play a leading role through the transmission of knowledge and where ICT is a mere add-on, unable to replace the teacher. All details in table 6.

We thought it would be interesting to explore possible differences in teachers' prior preparation, their academic experience

during the pandemic and their perception of online and offline teaching, between the different groups of individuals considered in table 2. Table 7 shows the results for which we found significant differences.

We did not find differences between genders or teaching categories, but we did find differences between branches of knowledge: arts and humanities, and health sciences acknowledge that they are less prepared in ICT and have less capacity to adapt.

Table 6  
Frequency distribution for items relating to teacher perception and experience

Prior teacher preparation					
Item	Frequencies %				
	1	2	3	4	5
I felt technologically prepared for online teaching.	47.4	23.7	16.6	7.4	4.9
I consider myself a great connoisseur of ICTs.	45.1	25.5	15.4	10.7	3.3
My knowledge of the tools offered by the virtual campus before the pandemic was high.	40.9	30.4	13.9	8.9	5.9
I am very active in web 2.0 (social networks, blog, etc).	52.2	30.0	11.9	4.4	1.5
I felt prepared to dynamise the virtual classroom.	34.1	29.1	25.8	4.5	6.5
I felt prepared to tackle online teaching from a didactic approach.	26.7	30.3	20.8	16.6	5.6
My approach to online teaching has been holistic, adapting it to ICTs from a different pedagogical approach to face-to-face teaching.	50.1	29.1	16.6	3.6	0.6
I have felt able to encourage student participation.	41.5	28.1	7.7	13.0	9.7
I have been creative in adapting the activities to be developed	48.3	29.3	8.0	10.0	4.4
Teacher perception					
Item	Frequencies %				
	1	2	3	4	5
I have found it very difficult to redesign subjects.	11.4	20.7	28.7	27.3	11.9
I have not had the time to assimilate the teaching change.	0	7.7	8.0	27.4	56.9
I have felt lost due to lack of guidelines for adapting the teaching	1.2	9.5	12.2	28.5	48.6
I have not had the time to develop the right materials.	0	1.4	11.2	42.2	45.2
It is not clear to me whether I have succeeded in providing quality training.	9.5	15.1	17.8	32.0	25.6
The adaptive teaching measures I have implemented have been improvised, in response to the situation.	2.9	2.3	23.8	29.4	41.6
The quality of my teaching has been affected by my limited use of ICTs.	7.4	14.5	22.2	30.2	25.7
The application of the training received in the classroom has not been adequate due to its haste.	6.2	11.3	24.1	30.3	28.1
I felt a sense of stress due to the unfamiliarity of the situation.	0	7.7	12.1	30.3	49.9
I felt a sense of stress due to the time needed to prepare the lessons.	9.1	13.9	22.5	25.6	28.9
I felt a sense of stress about possible connection problems.	15.4	18.2	21.9	28.4	16.1
The training courses received have been highly concentrated.	10.9	20.8	20.5	29.1	18.7
I have been overwhelmed by the number of training courses I have received.	9.5	20.5	24.3	21.4	24.3
I have not had time to assimilate the online training I have received.	0	21.0	25.2	22.6	31.2
Perception of online and offline teaching					
Item	Frequencies %				
	1	2	3	4	5
E-learning requires specific ICT training.	0	0	18.7	31.2	50.1
Online teaching requires different didactic preparation.	.9	4.4	28.4	22.2	43.9
I believe that online teaching requires a specific didactic model.	1.7	5.3	27.7	24.4	40.9
Face-to-face teaching is irreplaceable	6.8	10.3	25.9	28.5	28.5
I have tried to respect my face-to-face teaching schedule as much as possible.	.3	6.2	18.7	30.2	44.6
I see ICT as a complementary tool to the classroom.	1.4	10.7	17.3	47.8	22.8
I have mainly transferred the contents taught in the classroom to the virtual platform.	.6	2.9	28.5	29.1	38.9
I am committed to a teaching methodology based on the transmission of knowledge.	3.5	6.5	25.3	37.9	26.8

Table 7  
Significant differences for prior teacher preparation in the sample

Factor	Group	N	Media	T.D.	F	Sig.	Mix	T	Sig.
PREP_ICT	AH	44	-.121	.542	16.178	.000	AH-SLS	2.32	.000
	SLS	114	.210	.892			AH-S	2.10	.000
	S	42	.218	.901			AH-AE	2.27	.000
	AE	60	.199	.889			HS-SLS	3.05	.000
	HS	77	-.101	.510			HS-S	2.11	.001
							HS-AE	2.33	.000
INTER_ADAPTA	AH	44	.122	.436	8.336	.000	AH-SLS	2.28	.000
	SLS	114	.346	.778			AH-S	2.12	.000
	S	42	.398	.726			AH-AE	2.02	.000
	AE	60	.348	.701			HS-SLS	24.46	.000
	HS	77	.136	.502			HS-S	2.08	.000
							HS-AE	1.99	.000

## Discussion

The forced transition from face-to-face to digital teaching made the second semester of the 2019/20 academic year the moment in recent history when technology was most in demand in education (Mateo-Berganza and Lee, 2020). The emergence of an unexpected and unknown situation disrupted the face-to-face approach of most universities and challenged their governing bodies, faculty members, and students.

Emerged from data that there has not been a vision of teaching capable of adequately integrating ICT with the necessary pedagogical change required by online teaching.

Online teaching requires specific preparation of the teacher who, in addition to handling virtual tools and ICT, must develop a pedagogical model that is different from face-to-face teaching (Díaz-Guillen et al., 2021). The outbreak of the pandemic made it necessary to adopt rapid measures in a short-term time horizon, which also introduced unavoidable errors in the approach, which must be different for virtual teaching. So import traditional schemes such as face-to-face teaching to online, is not desirable. It seems that most lecturers are committed to face-to-face teaching and have tried to keep their methods and tools as unchanged as possible.

Hence, the measures adopted by the University under study, as is the case in most Spanish universities, justified digitisation for health reasons, disregarding or minimizing the importance of pedagogical ones, which results in a lack of a strategic vision on the digital transformation of higher education (Area-Moreira et al., 2021).

Most of the teaching staff is not digitally competent, meaning knowledgeable about the tools, skilled in their use and able to implement them with an *e-learning* approach. This result is consistent with Fernández-Regueira et al. (2020), who estimate that 68.07% of teachers have never taught online and are committed to a methodology based on the transmission of content. Furthermore, many teachers do not trust the possibilities offered by ICT, which means that they do not consider their incorporation (Prestridge, 2017; Torres-Díaz et al., 2015) or, at best, limit their usefulness to support functions but in no case to replace the face-to-face class (Guri-Rosenblit, 2018). This explains why, despite methodological changes to incorporate digital compe-

tences, these were made while maintaining traditional teaching structures that were far removed from the real learning possibilities offered by ICT (Fabregat et al. 2016; Zempoalteca et al. 2017; Area-Moreira et al. 2021).

On the other hand, the fact that teachers do not have adequate knowledge of ICT raises doubts as to whether the quality of their teaching has been adequate, which is consistent with Agreda et al. (2016) or Valdivieso and González (2016), when they say that the adequate implementation of ICT depends on the existence of digitally competent teachers.

It is important to point out that, despite that the institutional design of courses aimed at training teachers in the use of online environments, the speed with which the training was provided and the immediacy of its application in the classroom raises doubts about the quality of the teaching (González-Calvo et al., 2020). Thus, in line with García et al. (2020) and Niño et al. (2021), we note that teaching under these conditions is far from being the desirable online teaching.

We therefore observe that, to a large extent, teachers try to put ICT at the service of their traditional face-to-face class system, which consists of supporting a pedagogical model of content transmission, leaving aside *feedback* and continuous monitoring of student work. For this reason, most teachers recognise that they have limited themselves to transferring the contents of the face-to-face class to the virtual platform (Mercader, 2019, Venegas-Ramos et al., 2020; Pérez-López et al., 2021). Data reveals that the most used resources were the email, synchronous virtual presentations, and file sharing tools (Mercader and Gairín, 2017 and Mercader, 2019). Other tools, such as social networks or blogs, were seldom used, as Pérez-López et al. (2021) also pointed out. In terms of assessment tools, the most widely used has been the traditional exam (Fernández-Regueira et al., 2020), which has been the element that has caused the most stress for teachers, due to the risk of plagiarism, as Cabero-Almenara and Llorente Cejudo (2020) agree.

## Conclusions

Real support from institutions is required to overcome teachers' resistance to change, and this should not be limited to providing more technology, but rather to defining their role in

teaching and creating support services. Training must be gradual and avoid a strong utilitarian, transmissive and technological emphasis (Cabero-Almenara and Llorente-Cejudo, 2020). All this will allow teachers to change their way of seeing and understanding ICT to conceive them as LKT (Learning and Knowledge Technologies) and TEP (Technologies for Empowerment and Participation) (Cabero, 2014 and Pinto et al., 2017). In this way, it will be possible to move from a traditional paradigm based on the master class to more collaborative and student-centred models (Pérez-López et al., 2021).

From a proactive approach, it is necessary to offer training programmes that articulate both pedagogical and technological knowledge so that teachers are qualified to teach in any scenario, such as the one generated by COVID-19 (Amaya et al., 2021).

However, the transition to holistic digitalisation will only be possible if it is accompanied by a correctly defined strategic framework (García-Peñalvo et al., 2020), capable of bringing about a change in the university model, in addition to the transformation of teachers and students (Pérez-López et al., 2021). And the fact is that online education has different teaching processes to face-to-face education, from the way classes are approached, the handling of materials, the dynamics of participation, to the forms of monitoring, feedback, and evaluation of student performance (Amaya et al., 2021). In other words, university policies adopted during the pandemic have not considered the contributions of academic knowledge formulated in recent years by international *e-learning* experts (Sangrá, 2020).

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