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Development of EFL Teachers' Digital Competence in the Adoption of Blended Learning

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Abstract

The coronavirus pandemic affected education enormously, and despite numerous previous efforts to achieve digitalization, virtual teaching revealed deficiencies in both the EFL teachers' digital competence and in the peripheral use of Information and communication technologies (ICTs). This study focused on a sample group to analyze the relationship between the implementation of this model and the pre-pandemic digital approach in order to identify deficiencies that need to be strengthened to achieve increasingly effective integration of blended learning. A questionnaire was used to collect data from participating teachers in the areas of school digital strategy, digital competence, and teaching practice in blended learning. The data were analyzed through structural equation models, verifying the relation between variables and also according to specific training on ICTs. An active but insufficient effort on the part of the participants' schools to promote digitalization was revealed. The implementation of blended learning has been favored more by the responsiveness of participating EFL teachers than by the provision of specific training on the part of schools, which lacked common guidelines from the public administration. These EFL teachers can respond to changes, but the schools' support is essential for the successful implementation of blended learning, updating the approach of the digital strategy adopted so far.

Keywords: digital competence, blended learning, digital strategy, teacher training, ICT, digitalization

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1. Introduction

Digitalization is no longer a single dimension or a mere option in any area of our lives. Information and communication technologies are rather the backbone of our current society and the digitalization processes completely determine the pace and path of development in all areas (Al-Obaydi et al., 2023; Derakhshan et al., 2023). Although digitalization processes have been occurring for decades, in recent years, they have increased enormously and at an unprecedented pace, largely as a result of turning points such as the coronavirus pandemic, which led to accelerated and even forced digitalization in many cases. Be that as it may, it is undeniable that digitalization has reached new fields and taken on new forms as a result of the pandemic in virtually all spheres, including education (Derakhshan & Shakki, 2020). New teaching models have emerged, including blended learning, as well as a host of new digital educational tools, resources and platforms whose implementation became widespread in the wake of the pandemic and which are undoubtedly here to stay. Given that an increasing number of students and teachers belong to a generation of digital natives, it may seem that adaptation to the digitalization of teaching and learning processes will take place without difficulties. However, it is different to use technology as a complementary support tool than to use it as the core of educational processes, in which case the digital competence of teachers and students may be insufficient regardless of their previous familiarity with digital tools.

Hence, the new digital landscape in education poses many questions, including whether we will be able to structure teaching based on technology without compromising quality, whether teachers will be able to adapt their practice appropriately, and whether they will be provided with resources or training to standardize practices and ensure consistent quality. The current state of education in terms of digitalization is still somewhat uncertain, although it seems clear that there is great and promising potential.

2. Literature Review

Information and communication technologies (ICTs) and digital competence are now acknowledged as key elements in all domains (Ferrari, 2013; Teo et al., 2022). The Spanish education system has been working for years to integrate ICTs (Fernández-Cruz et al., 2018). Indeed, the latest updates of the Spanish curricular

guidelines for teaching continue to call for the full exploitation of its methodological potential. The benefit of technologies in terms of motivation and creativity (Cuetos-Revuelta et al., 2020) and other positive emotions that help to tackle boredom during the learning process (Derakhshan, 2021a, 2021b; Martínez-Borreguero et al., 2020; Shakki, 2023) cannot be overlooked. Consequently, there are higher expectations for the digitalization of schools (Engen, 2019). The education digitalization process in Spanish began several years ago with various projects (Aguaded-Gómez et al., 2010) and with the provision of digital resources aimed at significant methodological shifts (Area-Moreira et al., 2014). These initiatives have lately tried to adapt to the rapid digital revolution (Prendes-Espinosa & Cerdán-Cartagena, 2021; Khazaie et al., 2022), considering technology not a peripheral support but a core element of education (Gutiérrez-Martín et al., 2010). However, ICTs are sometimes still a sporadic teaching complement (Sancho-Gil & Correa-Gorospé, 2010), resulting in heterogeneous levels of digitalization of schools (Area-Moreira et al., 2020). Traditional teaching models still predominate, with cooperation and ICTs playing a subsidiary role (Monteagudo-Fernández et al., 2020), which indicates neither student-centered nor constructive learning (Pozo et al., 2021). The limited use of ICTs for information retrieval and word processing might also reveal a lack of preparation for a blended learning model (Peñarrubia-Lozano et al., 2021).

Thus, despite the numerous attempts to achieve a real digital transformation, the e-learning teaching models adopted during and after the coronavirus pandemic revealed several shortcomings still present in terms of the digitalization of education (Fernández-Río et al., 2022). EFL teachers need to understand that teaching quality is not influenced by physical distance (Cabero-Almenara, 2020) but rather by the mastery of the appropriate synchronous and asynchronous strategies and tools (Infante-Moro et al., 2022). Additionally, shortcomings in terms of digital competence to adapt to blended learning were also noticed (Schleicher, 2020), and many teachers admitted not knowing how to make significant use of e-learning (Graça et al., 2021). Hence, EFL teachers used technologies in an unfamiliar way, even when they were not ready to do so (OECD, 2020) and only received accelerated and unsatisfactory training (Torrado-Cespon, 2021), which in turn caused burnout and emotional exhaustion due to the impossibility of coping with such a demanding challenge without the necessary resources (Varela et al., 2023). This situation of burnout has been shown to be closely linked to teacher

effectiveness and motivation to develop their creativity and improve professionally using technology, among others (Momenzadeh et al., 2023).

While blended learning traditionally meant combining traditional face-to-face teaching with online learning tasks (Vázquez-Cano et al. 2013), it should actually involve using ICTs not just to do better the things we do without them but to do completely different things (Cabero-Almenara & Martínez-Gimeno, 2019), while ensuring that students receive effective support, including scaffolding to motivate them in blended learning environments as well (Guo et al., 2023). However, factors such as lack of mentoring and time are hindering this shift (Valverde-Berrocso et al., 2021).

After the pandemic, it is critically important to re-evaluate EFL teachers' needs to deal more effectively with the challenges of the new educational context. The public administration should also regularize the use of ICTs through specific methodological guidelines while taking into account previously overlooked factors, such as the psychological needs of the students within the virtual environments (Shafaq-Shah et al., 2021). It would also be worthwhile to identify in which areas and for which uses ICTs can have a positive effect on learning outcomes (Fernandez-Gutierrez et al., 2020) and to adapt in-service teacher training taking into account the evolving technological paradigm within education (Mestre-Espejo et al., 2017). Indeed, updating digital training might prevent gaps in the quality of teaching while making the most of the blended learning potential (Cabero-Almenara, 2020). Such training should be understood as a lifelong process that allows one to face digital challenges confidently (Garzón-Artacho et al., 2020). While it has traditionally been assumed that students and young teachers are digital natives with innate technological skills (Pérez-Ruiz, 2022), belonging to a digital generation does not imply being digitally competent (Granado-Palma, 2019), let alone knowing how to use technology in an interesting and attractive way in teaching processes (Wang, 2023). Hence, teachers in this digital era need specific training to sustain education quality (González-Díaz et al., 2022; Wang et al., 2023) and to be able to employ ICTs as more than non-constructive tools (Pérez-Calderón et al., 2021).

Therefore, despite ample evidence of the great potential of technology in education, the widespread agreement on the importance of continuous updating of teachers' digital competence and the numerous attempts of schools to achieve a real digitalization of education, the major shift in the educational paradigm that has

taken place in the last two years calls for in-depth research to assess whether all these efforts in terms of digitalization have led to real progress. This analysis is particularly important given that blended learning is no longer limited to the context of the pandemic, especially after having proved to be more beneficial than purely face-to-face teaching in certain areas of education (De Juan-González, 2019). On the basis of this research need, this paper addresses the following objectives:

- (1) What was the approach to ICTs-based teaching in schools before the pandemic?
 - (a) Has this approach favored the blended learning model?
- (2) How responsive were EFL teachers toward the new teaching model?
 - (a) What degree of influence did digital competence have on adaptability to the new model?
- (3) To what extent is teacher training decisive in the promotion of digital competence?
 - (a) To what extent is teacher training relevant to the successful implementation of blended learning?

3. Materials and Methods

3.1 Study Design and Participants

A descriptive, non-experimental design was used for this study. Convenience sampling was used to select those cases where the subjects possessed the characteristics required for the purpose of the study. Although it is assumed that the results cannot be generalized in the strict sense of the term, there is a legitimization of the quality of the inferences, the interpretative rigor, and the transfer of conclusions (Hernández-Sampieri et al., 2014, Onwuegbuzie & Johnson, 2006). This sampling strategy will allow for the ecological transfer to other environments or contexts since the informants are those directly linked to the question posed, given that they have the following characteristics, which have been the selection criteria for their selection:

- (1) In-service.

- (2) Teaching in a public or state-subsidized school.
- (3) Working experience in any of these schools before and during the year of the pandemic outbreak.
- (4) Familiarity with the blended learning model.

A single measurement was made for a single group. The data-producing sample consisted of a total of 216 participants, with a heterogeneous gender distribution. The female gender represented 77.8% ($n = 168$) and the male gender 22.2% ($n = 48$). Regarding age, the distribution was established in different groups, with 63.0% ($n = 136$) of teachers aged between 20-30 years, 27.8% ($n = 60$) aged between 31-40 years and 9.3% ($n = 20$) aged between 41-65 years. The sample group was asked to participate through a variety of channels. In this way, a total of 31 questionnaires were eliminated because they did not meet this criterion or were incorrectly completed.

3.2 Variables and Instruments

A self-elaborated and self-reporting ad-hoc questionnaire was used. Demographic aspects such as age, gender (male and female), and years of teaching experience were recorded. As described below, the remaining questions focus more specifically on collecting data on digital competence in the implementation of blended learning. The questionnaire was developed based on those used by Viberg et al. (2020) and Domingo-Coscolla et al. (2019). The design of a new instrument was considered more appropriate for this research, as the previously mentioned ones focused on digital competence before the pandemic. The digitalization of education has accelerated dramatically, and education is now predominantly online (Sáiz-Manzanares et al., 2022), so it was considered necessary to directly address the implementation of blended learning to observe more rigorously where the development of digital competence is heading. To this end, the questionnaire consists of 13 items that answer to a Likert-type scale with five response alternatives where "1 = strongly agree" and "5 = strongly disagree". Based on the information collected, the three fundamental blocks of the first structural equation model of the study were established: the school's digital strategy, the teacher's digital competence, and teaching practice in blended learning. In addition, within this ad-hoc questionnaire, teachers were asked if they had received specific training in ICTs for the design and planning of blended learning, which served for the

design of the second structural equation model.

3.3 Procedure

As a starting point, an exhaustive review of the scientific literature was carried out to extract information on the process of digitalization of education in recent years, as well as on the main problems evidenced by the implementation of the blended learning model due to the coronavirus pandemic. Subsequently, a Google Form was developed. It included the aforementioned questionnaire and detailed the aim and purpose of the study, offering the possibility of voluntary participation by giving informed consent when submitting the form. In terms of dissemination, mainly social networks were used to invite in-service EFL teachers to participate. Nevertheless, a total of 31 questionnaires were eliminated for not meeting this criterion or for being incorrectly completed. Furthermore, this study complied with research ethical principles regarding the assurance of anonymity and respect for participants' rights.

4. Analysis and Results

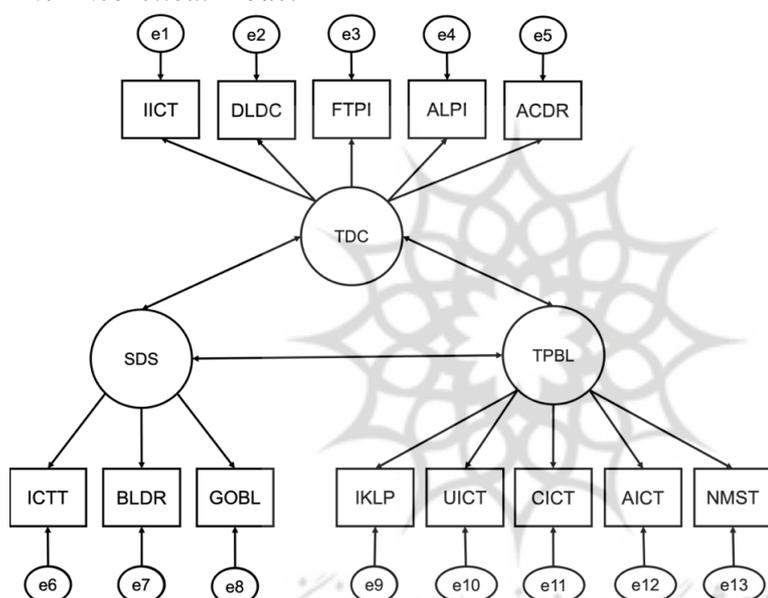
4.1 Data Analysis

The statistical software SPSS 25.0 (IBM Corp, Armonk, NY, USA) was used for the descriptive analysis through frequencies and averages, as well as for the T-Student test for independent samples. Thus, Cronbach's coefficient was used to determine the internal consistency of the instruments, establishing the reliability index at 95%.

The statistical software AMOS 23.0 (IBM Corp., Armonk, NY, USA) was used to perform the multi-group analysis using structural equation modeling (SEM). SEM was used to establish the relationships between the variables that make up the theoretical model (Figure 1) for both groups (having or not having specific training on ICTs for blended learning design and planning). Two different models were constructed, with the aim of verifying the relationships between variables according to specific training on ICTs. The SEM developed for this analysis was constructed from thirteen observable variables that provide explanations for the relationships of the unobservable variables. In this case, the causal explanations of the exogenous

variables were made by considering the observed associations between the indicators and the reliability of the measurements. Thus, the measurement error of the observable variables was included in the model and could be directly controlled and interpreted as multivariate regression coefficients. The one-way arrows represent the lines of influence between the latent variables and are interpreted based on the regression weights. A significance level of .05 was established using Pearson's Chi-square test (see Figure 1).

Figure 1
The Theoretical Model



Note 1: Teacher's digital competence (TDC); Ease of implementation of ICTs in education (IICT); Difficulty in introducing ICTs in relation to low digital competence (DLDC); Facility in adapting teaching planning to ICT-based teaching (FTPI); Autonomous learning promotion through ICTs (ALPI); Ability to create digital resources and materials to support teaching (ACDR).

Note 2: School digital strategy (SDS); Implementation of ICT-based teaching before the pandemic (ICTT); Blended learning benefit of the school's digital resources (BLDR); School's guidelines and objectives for the use of ICTs in blended learning (GOBL)

Note 3: Teaching practice in blended learning (TPBL); Influence of prior

knowledge in ICTs for successful blended learning practices (IKLP); Use of ICTs in teaching before the pandemic (UICT); Post-pandemic changes in the use of ICTs (CICT); Confidence to apply ICT in blended learning (AICT); Perceived need for more specific training (NMST)

Teacher digital competence (TDC), school digital strategy (SDS), and teaching practice in blended learning (TPBL) represent the exogenous variables that have a bidirectional effect on each other. The endogenous variables Ease of ICT implementation in teaching (IICT), Difficulty of introducing ICT in relation to low digital competence (DLDC), Ease of adapting teaching planning to ICT-based teaching (FTPI), Promotion of autonomous learning through ICT (ALPI) and Ability to create digital resources and materials to support teaching (ACDR), receive the effect of the TDC. The endogenous variables Implementation of ICT-based teaching before the pandemic (ICTT), Blended learning benefit from school digital resources (BLDR) and School guidelines and objectives for the use of ICTs in blended learning (GOBL) receive the effect of SDS. And the endogenous variables Influence prior ICT knowledge on the success of blended learning practices (IKLP), Use of ICT in teaching before the pandemic (UICT), Post-pandemic changes in the use of ICTs (CICT), Confidence to apply ICTs in blended learning (AICT) and Perceived need for more specific training (NMST), receive the effect of TPBL.

In order to verify the compatibility between the model developed and the empirical data obtained, the fit of the model was examined. Following the criteria proposed by Marsh (2007), the reliability of the model was obtained according to the goodness of fit. For the Chi-square analysis, values associated with a non-significant p-value indicate a good model fit. Since this statistic is very sensitive to sample size effects, other fit indices should be used (Byrne, 2010). Other parameters such as the comparative fit index (CFI), normalized fit index (NFI), incremental fit index (IFI), and Tucker-Lewis index (TLI) were used. The values obtained should be above 0.90 to represent an acceptable fit and values above 0.95 to represent an excellent fit. In addition, the root mean square error of approximation (RMSEA) was employed, where acceptable fit is determined by values at 0.08 and excellent fit with values below 0.05.

4.2 Results

The general model showed a good fit for all indices. For the Chi-square analysis, a significant p-value was found ($X^2 = 438.174$; $df = 48$; $p = 0.001$). However, these indicators cannot be interpreted in isolation due to the susceptibility and influence of sample size (Marsh, 2007). Thus, other standardized fit indices that are less sensitive to sample size were used.

For the comparative fit index (CFI) analysis, a value of 0.990 was obtained; for the normalized fit index (NFI) analysis, a value of 0.989; and for the incremental fit index (IFI) a value of 0.993, which describes an excellent fit. In the Tucker-Lewis index (TLI) analysis, a value of 0.913 was obtained, which is an acceptable fit. The root mean square error of approximation analysis (RMSEA) also obtained an excellent value of 0.057.

Figure 2 and Table 1 recorded the regression weights for the general model, for which statistically significant relationships were obtained at levels $p < 0.05$, $p < 0.01$, and $p < 0.001$. Digital competence (TDC) had a positive effect on the Facility in adapting teaching planning to ICT-based teaching (FTPI) ($p < 0.001$; $r = .737$), Autonomous learning promotion through ICTs (ALPI) ($p < 0.001$; $r = .532$) and Ability to create digital resources and materials to support teaching (ACDR) ($p < 0.001$; $r = .699$). However, TDC itself was negatively associated with Difficulty in introducing ICTs in relation to low digital competence (DLDC) ($p < 0.001$; $r = -.629$). It was also noted that School digital strategy (SDS) exerted a positive effect on the Blended learning benefit of the school's digital resources (BLDR) ($p < 0.001$; $r = .650$) and School's guidelines and objectives for the use of ICTs in blended learning (GOBL) ($p < 0.001$; $r = .483$). So did Teaching practice in blended learning (TPBL) with Post-pandemic changes in the use of ICTs (CICT) ($p < 0.01$; $r = .246$) and Confidence to apply ICTs in blended learning (AICT) ($p < 0.001$; $r = .683$). Whereas TPBL exerted a negative effect on the Use of ICTs in teaching before the pandemic (UICT) ($p < 0.001$; $r = -.318$). Finally, it should be noted that SDS

exerted a negative bidirectional effect with TPBL ($p < 0.001$; $r = -.470$) and TDC ($p < 0.001$; $r = -.692$), while a positive bidirectional association was demonstrated between the latter two variables ($p < 0.05$; $r = .275$).

Figure 2
Structural Equation Model

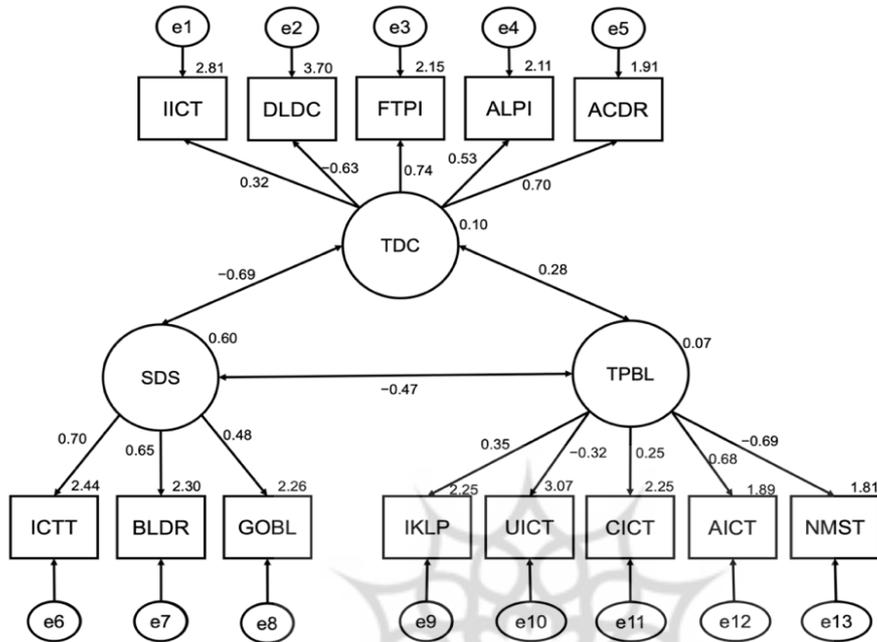


Table 1
The General Structural Model

Associations between Variables			Estimations	R.W. S.E.	C.R.	P	S.R.W. Estimations
IICT	←	TDC	1.000				0.322
DLDC	←	TDC	-1.975	0.490	-4.032	***	-0.629
FTPI	←	TDC	1.674	0.403	4.154	***	0.737
ALPI	←	TDC	1.307	0.339	3.857	***	0.532
ACDR	←	TDC	1.518	0.369	4.120	***	0.699
ICTT	←	SDS	1.000				0.699
BLDR	←	SDS	0.848	0.158	5.384	***	0.650
GOBL	←	SDS	0.518	0.105	4.948	***	0.483
IKLP	←	TPBL	1.000				0.350
UICT	←	TPBL	-0.832	0.266	-3.126	***	-0.318
CICT	←	TPBL	1.090	0.412	2.643	**	0.246
AICT	←	TPBL	2.924	0.687	4.257	***	0.683
NMST	←	TPBL	-2.427	0.570	-4.259	***	-0.685
TDC	↔	TPBL	0.054	0.025	2.666	*	0.275
SDS	↔	TDC	-0.056	0.019	-2.927	***	-0.692
SDS	↔	TPBL	-0.095	0.030	-3.124	***	-0.470

Note 1: p < 0.05 (*); p < 0.01 (**); p < 0.001 (***)

In the line of study, for Table 2, the relationship between specific training in ICTs and the different categories of the variables TDC, SDS, and TPBL was established. Statistically significant differences were found ($p \leq 0.05$). The results showed that those subjects who had received training in ICTs obtained higher average values in IICT ($M = 3.17 \pm 0.83$), ICTT ($M = 2.72 \pm 0.80$), GOBL ($M = 2.61 \pm 1.12$), IKLP ($M = 2.44 \pm 0.96$), AICT ($M = 2.06 \pm 1.81$) and NMST ($M = 1.94 \pm 0.81$).

Table 2*Relationship between Specific Training in ICTs and TDC, SDS and TPBL*

Variables	Categories	PTICT	M		Test de Levene		T-Test												
			M	DT	F	Sig.	T	gl	Sig.										
TDC	IICT	Si	3,17	0,83	2,254	0,135	-3,909	214	0,000										
		No	2,64	0,98															
	DLDC	Si	3,67	1,05						26,935	0,000	-0,866	182,315	0,388					
		No	3,78	0,79															
	FTPI	Si	2,17	0,80											16,341	0,000	0,645	209,826	0,520
		No	2,11	0,46															
ALPI	Si	2,14	0,89	45,483	0,000	0,943	212,723	0,347											
	No	2,06	0,40																
ACDR	Si	1,89	0,74						19,669	0,000	-0,634	188,598	0,527						
	No	1,94	0,52																
SDS	ICTT	Si	2,72											0,80	0,765	0,383	-3,556	214	0,000
		No	2,31											0,81					
	BLDR	Si	2,28	1,04	0,848	0,358	-0,379	214						0,705					
		No	2,33	0,94															
	GOBL	Si	2,61	1,12					1,342	0,248	-3,369	214	0,001						
		No	2,08	1,06															
IKLP	Si	2,44	0,96	3,190											0,076	-2,088	214	0,038	
	No	2,17	0,90																
TPBL	UICT	Si	3,17		1,14	1,751	0,187	1,723						214					0,086
		No	2,89		1,05														
	CICT	Si	2,28		0,96				6,784	0,010	0,289	101,852	0,773						
		No	2,22		1,48														
	AICT	Si	2,06	0,78	5,026										0,026	-2,361	116,204	0,020	
		No	1,81	0,61															
NMST	Si	1,94	0,81	4,897		0,028	4,316	205,355						0,000					
	No	1,56	0,50																

In addition to that described above, a multi-group equation model was developed for the variables and population of the study, depending on whether or not the subjects had received specific training in ICTs before the pandemic. For the first model treating data from subjects who did receive training in ICTs, it showed a

good fit for all indices. For the Chi-square analysis, a significant p-value was found ($X^2 = 395.370$; $df = 62$; $pl = 0.002$). However, these indices cannot be interpreted in isolation due to the influence of sample size and susceptibility. Therefore, other standardized fit indices that are less sensitive to the sample were used.

In the analysis of the comparative fit index (CFI) a value of 0.972 was obtained, in the analysis of the normalized fit index (NFI) a value of 0.935 was obtained and in the incremental fit index (IFI) it was 0.988, which describes an excellent fit. In the analysis of the Tucker-Lewis index (TLI) a value of 0.901 was observed, which in this case is an acceptable fit. The root mean square error of approximation analysis (RMSEA) also showed an excellent value of 0.064.

Table 3 shows the regression weights for the model based on participation in ICT training, for which statistically significant relationships were obtained at levels $p < 0.05$, $p < 0.01$, and $p < 0.001$. For those subjects who participated, TDC had a positive effect on FTPI ($p < 0.001$; $r = 0.745$), ALPI ($p < 0.001$; $r = 0.435$) and ACDR ($p < 0.001$; $r = 0.727$), while it had a negative effect on DLDC ($p < 0.001$; $r = -0.788$) and a bidirectional and negative effect on SDS ($p < 0.01$; $r = -0.998$). Thus, SDS was positively associated with BLDR ($p < 0.001$; $r = 0.732$) and GOBL ($p < 0.001$; $r = 0.348$), but bi-directionally negatively associated with TPBL ($p < 0.01$; $r = -0.460$). Finally, TPBL exerted a positive effect on CICT ($p < 0.01$; $r = 0.348$) and AICT ($p < 0.001$; $r = 0.634$), while it exerted a negative effect on UICT ($p < 0.001$; $r = -0.563$) and NMST ($p < 0.001$; $r = -0.587$). In this way, TPBL and TDC were bidirectionally and positively associated ($p < 0.05$; $r = 0.396$).

Table 3
Structural Model for Individuals Involved in Specific Training in ICTs

Associations between Variables			R.W.			P	S.R.W.
			Estimations	S.E.	C.R.		Estimations
IICT	←	TDC	1.000				0.335
DLDC	←	TDC	-2.539	0.673	-3.773	***	-0.788
FTPI	←	TDC	1.821	0.487	3.735	***	0.745
ALPI	←	TDC	1.180	0.373	3.167	***	0.435
ACDR	←	TDC	1.638	0.441	3.716	***	0.727
ICTT	←	SDS	1.000				0.849
BLDR	←	SDS	0.846	0.181	4.661	***	0.732
GOBL	←	SDS	0.312	0.092	3.405	***	0.348
IKLP	←	TPBL	1.000				0.297
UICT	←	TPBL	-1.432	0.453	-3.161	***	-0.563

Associations between Variables			Estimations	R.W.			S.R.W.
				S.E.	C.R.	P	Estimations
CICT	←	TPBL	1.381	0.518	2.666	**	0.348
AICT	←	TPBL	2.994	0.922	3.248	***	0.634
NMST	←	TPBL	-2.177	0.682	-3.193	***	-0.587
TDC	↔	TPBL	0.058	0.035	1.673	*	0.396
SDS	↔	TDC	-0.079	0.032	-2.488	**	-0.998
SDS	↔	TPBL	-0.079	0.035	-2.270	**	-0.460

Note 1: $p < 0.05$ (*); $p < 0.01$ (**); $p < 0.001$ (***)

The model developed for the variables measured on the basis of the subjects who did not receive specific training in ICTs also showed acceptable fits. A significant p -value was found in the Chi-square analysis ($X^2 = 317.412$; $df = 62$; $pl = 0.000$). In addition, other standardized fit indices were used, as the indicators mentioned may be susceptible to and influenced by sample size (Marsh, 2007).

The fit of the model for the subjects who did not receive specific training in ICTs was acceptable since in the analysis of the comparative fit index (CFI) a value of 0.901 was obtained, in the analysis of the normalized fit index (NFI) a value of 0.917; in the incremental fit index (IFI) analysis, a value of 0.908 was obtained and in the Tucker-Lewis index (TLI) analysis, a value of 0.887 was recorded. Likewise, for the analysis of the root mean square error of approximation (RMSEA) a value of 0.076 was obtained, which is acceptable.

Table 4 shows the regression weights for the model based on the subjects who did not receive specific training in ICTs and for which statistically significant relationships were obtained at levels $p < 0.05$, $p < 0.01$, and $p < 0.001$. Considering the subjects who did not receive specific training in ICTs, they coincide with those who did in that SDS exerted a positive effect on BLDR ($p < 0.01$; $r = 0.394$) and GOBL ($p < 0.001$; $r = 0.660$). However, the main differences between the models were that TDC had a negative effect on ALPI ($p < 0.05$; $r = -0.754$) and ACDR ($p < 0.05$; $r = -0.722$). Also, it is worth noting that TDC was bidirectionally and positively associated with SDS ($p < 0.05$; $r = 0.570$).

Table 4
Structural Model for Individuals Who Did Not Receive Specific Training in ICTs

Associations between Variables			Estimations	R.W.			S.R.W.
				S.E.	C.R.	P	Estimations
IICT	←	TDC	1.000				0.226
DLDC	←	TDC	0.393	0.600	0.655	0.512	0.094
FTPI	←	TDC	-0.192	0.343	-0.562	0.574	-0.079
ALPI	←	TDC	-1.618	0.961	-1.683	*	-0.754
ACDR	←	TDC	-2.010	1.197	-1.679	*	-0.722
ICTT	←	SDS	1.000				0.456
BLDR	←	SDS	0.734	0.276	2.654	**	0.394
GOBL	←	SDS	1.045	0.294	3.561	***	0.660
IKLP	←	TPBL	1.000				0.189
UICT	←	TPBL	1.259	1.360	0.926	0.355	0.152
CICT	←	TPBL	2.771	2.737	1.012	0.311	0.177
AICT	←	TPBL	6.511	4.544	1.433	0.152	0.584
NMST	←	TPBL	-8.315	5.678	-1.464	0.143	-0.818
TDC	↔	TPBL	0.043	0.032	1.324	0.185	0.446
SDS	↔	TDC	0.008	0.009	1.045	*	0.570
SDS	↔	TPBL	-0.039	0.029	-1.333	0.182	-0.821

Note 1: $p < 0.05$ (*); $p < 0.01$ (**); $p < 0.001$ (***)

5. Discussion

The analysis of the previously presented results led to a number of conclusions with regard to the initial objectives of this study. As for the pre-pandemic situation in schools, ICT-based teaching was already being promoted before the pandemic in the participant's schools (Prendes-Espinosa & Cerdán-Cartagena, 2021), especially in terms of the provision of digital resources and the definition of a common strategy with homogeneous and clearly defined objectives and guidelines. Moreover, the adoption of a digital strategy was equally important in all the schools considered, regardless of whether it involved digital training for teachers. Yet, we can conclude that this previous approach to the digitalization of teaching and learning was neither sufficient for the optimal development of teachers' digital competence nor for a fully smooth and successful implementation of blended learning homogeneously in these schools (Area-Moreira et al., 2020).

One of the most straightforward conclusions to be drawn from this study is related to the attitude of the participating EFL teachers, which has been reaffirmed as a key element in the digitalization process. There was a widespread satisfactory response on their part to the new blended learning model, proving proactive and

flexible towards the new approach to ICTs and to the new needs that it posed despite the challenges faced on a practical and emotional level (Varela et al., 2023). They also showed great responsibility and commitment in recognizing that their previous use of ICTs did not benefit the new teaching model (Pozo et al., 2021) and it has been observed that the participating EFL teachers adjusted consequently their use of ICTs with increasing levels of confidence. However, it is worth mentioning that both students and teachers with a higher level of computer literacy are less fearful and anxious about using technology in the classroom; therefore, the development of digital competence is essential to promote such digital confidence (Chen et al., 2023).

It has also become evident that the participating teachers' digital competence, as well as the updating of such competence, favors the implementation of the new teaching model and, likewise, blended learning favors, in turn the development of digital competence (Wang et al., 2023). In addition, it can be concluded that EFL teachers' digital competence benefits from some of the distinctive features of blended learning, from the creation of resources or the promotion of autonomous learning through ICTs to the design of activities that are more engaging and prevent boredom among students (Derakhshan, 2021a, 2021b; Martínez-Borreguero et al., 2020). However, there is a widespread perception among the study subjects that this digital competence, although fruitful in many respects, remains low and therefore insufficient, especially in terms of the use and knowledge of more elaborate digital tasks that are far from the more "traditional" uses of technology in classrooms before the pandemic (Skevi et al., 2023).

Regarding the assessment of the importance of prior training on ICTs, such training promoted competence in the use of ICTs, both before and after the pandemic, as well as its confident implementation in the classroom and in blended learning. However, despite having received training, the need for more extensive training among the participating teachers is clearly identified, in line with Garzón-Artacho et al. (2020). Previous training served to get by at a particular moment as successfully as possible, although not with sufficient confidence. While it is true that participating EFL teachers who had received digital training felt better equipped for blended learning and even to do so in a way that was motivating and meaningful for the students (Guo et al., 2023), those who had not received it relied on the school's digital strategy to counteract possible shortcomings in their digital competence. In any case, the teachers surveyed generally call for a change of

approach to truly learn to implement technology effectively in their practice and in a way that is actually meaningful (Wang, 2023), since many of them still consider that their digital competence is too low to make the most effective use of digital tools in education, which prevents them from benefiting from the technology-based teaching methods that have become widespread in the wake of the pandemic, and even more so from the most cutting-edge ones (Khazaie et al., 2022).

In the case of the study participants, the successful implementation of blended learning has been mainly due to their ability to quickly adapt their approach to ICTs and not so much to previous digitization processes in education. This becomes even more evident taking into account that at the time of the pandemic, the public administration, which is ultimately responsible for the schools, did not set out a homogeneous strategy but rather left it up to the schools to adopt concrete measures to adapt to the new situation (Consejo Escolar del Estado, 2021), resulting in highly heterogeneous results between schools (Hernández-Ortega & Álvarez-Herrero, 2021).

The conclusions seem clear: EFL teachers participating in this study know how to face the challenges ahead in their teaching practice in spite of the most adverse circumstances, but they need specific and continuous training so that the future of education is not left to chance.

6. Limitations of the Study and Suggestions for Future Research

It is worth mentioning that the present study also presents certain limitations. As mentioned above, the convenience sample is representative of the target population and allows, due to its characteristics, transferability to other contexts for the purpose of this study. However, it is still a limiting factor as it is understood that the results of this sample cannot be generalized and applied to all EFL teachers in Spain. For this reason, it has been repeatedly stated throughout this study that the results and conclusions apply to the specific sample studied. However, this limitation could be diminished in future research by increasing the scope of the convenience sample.

In the same sense, the sampling has been limited to the regional scope of the Autonomous Community of Andalusia. This region is the most populated in Spain with more than 8.5 million inhabitants. Hence, a sample from Andalusia may be fairly representative of the target population at the national level, although again, the results cannot be fully extrapolated to all EFL teachers in Spain. In the case of

this limitation, future research could extend the scope to a national level or, at least, to those regions of the Spanish territory with a larger population so that the sample would be even more representative.

Declaration of Interest Statement

The authors report there are no competing interests to declare.



References

- Aguaded-Gómez, J. I., Pérez-Rodríguez, M. A., & Monescillo-Palomo, M. (2010). Towards a curricular integration of the Information and Communication Technology (ICT) in primary and secondary schools in Andalusia (Spain). *Bordón. Revista de pedagogía*, 62(4), 7–24. <http://bit.ly/3GTws39>
- Al-Obaydi, L. H., & Pikhart, M., Shakki, F. (2023). Digital gaming as a panacea for incidental L2 acquisition in an EFL context. *Applied Research on English Language*, 12(1), 73–94. <https://doi: 10.22108/are.2022.135344.2001>
- Area-Moreira, M., & Sanabria-Mesa, A. L. (2014). Opinions, expectations and evaluations of teachers participating in the Programme School 2.0 in Spain. *Educar*, 50(1), 15–39. <https://doi.org/10.5565/rev/educar.64>
- Area-Moreira, M., Santana-Bonilla, P. J., & Sanabria-Mesa, A. L. (2020). The digital transformation of schools. Obstacles and resistance. *Digital education review*, (37), 15–31. <https://doi.org/10.1344/der.2020.37.15-31>
- Cabero-Almenara, J. (2020). Learning from the time of the COVID-19. *Revista Electrónica Educare*, 24, 1–3. <http://dx.doi.org/10.15359/ree.24-s.2>
- Cabero-Almenara, J. & Martínez-Gimeno, A. (2019). Information and communication technologies and initial teacher training. Digital models and competences. *Profesorado: Revista de currículum y formación del profesorado*, 23(3), 247–268. <https://doi.org/10.30827/profesorado.v23i3.9421>
- Chen, R, Ng, B. S., Paramasivam S. (2023). Toward the implications of technology-based education and EFL learners' anxiety for instructions. *Language Related Research*, 14(3), 265–287. <https://doi.org/10.29252/LRR.14.3.11>
- Consejo Escolar del Estado. (2021). Current situation of education in Spain as a result of the pandemic. <http://bit.ly/3ijzSBW>
- Cuetos-Revuelta, M. J., Grijalbo-Fernández, L., Argüeso-Vaca, E., Escamilla-Gómez, V., & Ballesteros-Gómez, R. (2020). Potential of ICTs and their role in fostering creativity: teachers' perceptions. *RIED. Revista Iberoamericana de Educación a Distancia*, 23(2), 287–306. <http://dx.doi.org/10.5944/ried.23.2.26247>
- De Juan-González, P. (2019). Experimental comparative study between a virtual and a face-to-face environment in an English subject. *Porta Linguarum Revista*

Interuniversitaria De Didáctica De Las Lenguas Extranjeras, (32), 119–134.
<https://doi.org/10.30827/pl.v0i32.13703>

Derakhshan, A., Kruk, M., Mehdizadeh, M., & Pawlak, M. (2021a). Activity-induced boredom in online EFL classes. *ELT Journal*, 76(1), 58–68.
<https://doi.org/10.1093/elt/ccab072>

Derakhshan, A., Kruk, M., Mehdizadeh, M., & Pawlak, M. (2021b). Boredom in online classes in the Iranian EFL context: Sources and solutions. *System*, 101.
<https://doi.org/10.1016/j.system.2021.102556>

Derakhshan, A, Eslami, Z. R., & Shakki, F. (2023). Comparing compliments in Face-to-Face vs. online interactions among Iranian speakers of Persian. *Pragmatics and Society*. <https://doi.org/10.1075/ps.22102.der>

Derakhshan, A., & Shakki, F. (2020). [Review of the book *Worldwide English Language Education Today: Ideologies, Policies, and Practices*, by A. Al-Issa & S. A. Mirhosseini]. *System*, 90. <https://doi.org/10.1016/j.system.2020.102224>

Domingo-Coscollola, M., Bosco-Paniagua, A., Carrasco-Segovia, S., & Sánchez-Valero, J.-A. (2019). Fostering digital competence in teaching at university: Perception of students and lecturers. *Revista de Investigación Educativa*, 38(1), 167–182. <https://doi.org/10.6018/rie.340551>

Engen, B. K. (2019). Understanding social and cultural aspects of teachers' digital competencies. *Comunicar*, 27(61), 9–19. <https://doi.org/10.3916/C61-2019-01>

Fernández-Cruz, F.J., Fernández-Díaz, M.J., & Rodríguez-Mantilla, J.M. (2018). The process of integration and pedagogical use of ICTs in schools in Madrid. *Educación XXI*, 21(2), 395–416. <https://doi.org/10.5944/educxx1.17907>

Fernández-Gutiérrez, M., Gimenez, G., & Calero, J. (2020). Is the use of ICT in education leading to higher student outcomes? Analysis from the Spanish Autonomous Communities. *Computers & Education*, 157, 103969. <https://doi.org/10.1016/j.compedu.2020.103969>

Fernández-Río, J., López-Aguado, M., Pérez-Pueyo, Á., Hortigüela-Alcalá, D., & Manso-Ayuso, J. (2022). The digital divide uncovered by the coronavirus pandemic: research on teachers and families. *Revista complutense de educación*, 33(2), 351–360. <https://doi.org/10.5209/rced.74389>

Ferrari, A. (2013). DIGCOMP: A framework for developing and understanding

- digital competence in Europe. Publications Office of the European Union. <https://doi.org/10.2788/52966>
- Garzón-Artacho, E., Sola-Martínez, T., Ortega-Martín, J. L., Marín-Marín, J. A., & Gómez-García, G. (2020). Teacher training in lifelong learning. The importance of digital competence in the encouragement of teaching innovation. *Sustainability*, 12(7), 2852. <https://doi.org/10.3390/su12072852>
- González-Díaz, R., Acevedo-Duque, Á., Martín-Fiorino, V., & Cachicatari-Vargas, E. (2022). Latin American professors' research culture in the digital age. *Comunicar*, 30(70), 71–83. <https://doi.org/10.3916/C70-2022-06>
- Graça, V. G., Quadros-Flores, P., Raposo-Rivas, M., & Ramos, M. (2021). ICTs in the initial training of educators and teachers. *Revista Latinoamericana De Tecnología Educativa - RELATEC*, 20(1), 27-37. <https://doi.org/10.17398/1695-288X.20.1.27>
- Granado-Palma, M. (2019). Education and digital exclusion: false digital natives. *Revista De Estudios Socioeducativos. ReSed*, (7), 27–41. http://dx.doi.org/10.25267/Rev_estud_socioeducativos.2019.i7.02
- Guo, Y., Wang, Y., & Ortega-Martín, J. L. (2023). The impact of blended learning-based scaffolding techniques on learners' self-efficacy and willingness to communicate. *Porta Linguarum Revista Interuniversitaria De Didáctica De Las Lenguas Extranjeras*. (40). <https://doi.org/10.30827/portalin.vi40.27061>
- Gutiérrez-Martín, A., Palacios-Picos, A., & Torrego-Egido, L. (2010). The training of future teachers and the integration of ICTs in education: the anatomy of a misunderstanding. *Revista de educación*, (353), 267–293. <http://bit.ly/3u5z8Dm>
- Hernández-Sampieri, R., Fernández, C. & Baptista, P. (2014). *Research methodology* (6th edition). McGrawHill.
- Hernández-Ortega, J., & Álvarez-Herrero, J. F. (2021). Educational management of COVID-19 lockdown: teachers' perceptions in Spain. *Revista española de educación comparada*, (38), 129–150. <https://doi.org/10.5944/reec.38.2021.29017>
- Infante-Moro, A., Infante-Moro, J. C., & Gallardo-Pérez, J. (2022). Key factors in the success of virtualization of teaching in Spanish universities during the COVID-19 pandemic. *Journal of New Approaches in Educational Research*, 11(2), 277–294. <https://doi.org/10.7821/naer.2022.7.1002>

- Khazaie, S., Derakhshan, A., & Kianpour, M. (2022). A contributory study into the (non)effect of augmented reality-mediated learning on students' English nursing purposes comprehension and performance. *Language Related Research*, 13(4), 185–219. <https://doi.org/10.52547/LRR.13.2.6>
- Maestre-Espejo, M.M., Nail, O. & Rodríguez-Hidalgo, A.J. (2017). Developing ICT and inclusive education competences in initial teacher education practice. *Bordón. Revista De Pedagogía*, 69(3), 1–16. <https://doi.org/10.13042/Bordon.2017.51110>
- Marsh H. W. (2007). Application of confirmatory factor analysis and structural equation modeling in sport and exercise psychology. In Tenenbaum G., Eklund R. C. (Eds.), *Handbook of sport psychology* (3rd ed., pp. 774–798). Wiley. <https://doi.org/10.1002/9781118270011.ch35>
- Martínez-Borreguero, G., Perera-Villalba, J. J., Mateos-Nunez, M., & Naranjo-Correa, F. L. (2020). Development of ICT-based didactic interventions for learning sustainability content: Cognitive and affective analysis. *Sustainability*, 12(9), 3644. <https://doi.org/10.3390/su12093644>
- Momenzadeh, S. E., Pishghadam, R., & Naji Meidani, E. (2023). Examining the role of active/passive motivation in EFL teachers' burnout and efficacy. *Language Related Research*, 14(1), 1–33. <https://doi.org/10.29252/LRR.14.1.1>
- Monteagudo-Fernández, J., Pérez, R. A. R., Escribano-Miralles, A., & García, A. M. R. (2020). Secondary education students' perceptions of history teaching through the use of ICTs and digital resources. *Revista Electrónica Interuniversitaria de Formación del Profesorado*, 23(2). <https://doi.org/10.6018/reifop.417611>
- OECD (2020). How prepared are teachers and schools to face the changes to learning caused by the coronavirus pandemic?. *Teaching in Focus*, (32). <https://doi.org/10.1787/2fe27ad7-en>
- Onwuegbuzie, A. J. & Johnson, R. B. (2006). The validity issue in mixed research. *Research in the Schools*, 13(1), 48–63. <https://bit.ly/3Wo2wR6>
- Peñarrubia-Lozano, C., Segura-Berges, M., Lizalde-Gil, M., & Bustamante, J. C. (2021). A Qualitative analysis of implementing e-learning during the COVID-19 lockdown. *Sustainability*, 13(6), 3317. <https://doi.org/10.3390/su13063317>
- Pérez-Calderón, E., Prieto-Ballester, J.-M., & Miguel-Barrado, V. (2021). Analysis of digital competence for Spanish teachers at pre-university educational key stages during COVID-19. *International Journal of Environmental Research and Public*

Health, 18(15), 8093. <https://doi.org/10.3390/ijerph18158093>

- Pérez-Ruiz, J. (2022). Online classes and digital competence in Taiwanese learners of Spanish during the COVID-19 pandemic. *Porta Linguarum Revista Interuniversitaria De Didáctica De Las Lenguas Extranjeras*, (38), 119–135. <https://doi.org/10.30827/portalin.vi38.22185>
- Pozo, J. I., Echeverría, M. P. P., Cabellos, B., & Sánchez, D. L. (2021). Teaching and learning in times of COVID-19: Uses of digital technologies during school lockdowns. *Frontiers in Psychology*, 12, 656776 <https://doi.org/10.3389/fpsyg.2021.656776>
- Prendes-Espinosa, M. P., & Cerdán-Cartagena, F. (2021). Advanced technologies to meet the challenge of educational innovation. *RIED. Revista Iberoamericana de Educación a Distancia*, 24(1), 35–53. <http://dx.doi.org/10.5944/ried.24.1.28415>
- Sáiz-Manzanares, M. C., Casanova, J. R., Lencastre, J. A., Almeida, L., & Martín-Antón, L. J. (2022). Student satisfaction with online teaching in times of COVID-19. *Comunicar*, 30(70), 35–45. <https://doi.org/10.3916/C70-2022-03>
- Sancho-Gil, J. & Correa-Gorospe, J. M. (2010). Change continuity in changing education systems. *Revista de Educación*, (352), 17–2. <http://bit.ly/3GPxTQ9>
- Schleicher, A. (2020). *The Impact of COVID-19 on Education: Insights from "Education at a Glance 2020"*. OECD Publishing. <http://bit.ly/3VvFvnp>
- Shakki, F. (2023). Investigating the relationship between EFL learners' engagement and their achievement emotions. *Porta Linguarum An International Journal of Foreign Language Teaching and Learning*, 40(2), 275–294. <https://doi.org/10.30827/portalin.vi40.27338>
- Shafaq-Shah, S., Ali-Shah, A., Memon, F., Ahmad-Kemal, A., & Soomro, A. (2021). Online learning during the COVID-19 pandemic: Applying the self-determination theory in the 'new normal'. *Revista de Psicodidáctica*, 26(2), 169–178. <https://doi.org/10.1016/j.psicod.2020.12.004>
- Skevi, O., Ortega-Martin J. L., & González-Gijón G. (2023). Use of ICTs and the digital competences of foreign language teachers before and during the state of alarm. *Language Related Research*, 14 (1), 145–166. <https://doi.org/10.29252/LRR.14.1.6>
- Teo, T., Khazaei, S., & Derakhshan, A. (2022). Exploring teacher immediacy-

- (non)dependency in the tutored augmented reality game-assisted flipped classrooms of English for medical purposes comprehension among the Asian students. *Computers and Education*, 179. <https://doi.org/10.1016/j.compedu.2021.104406>
- Torrado-Cespón, T. (2021). ICT/LKT and COVID-19: use and needs of secondary school teachers in Galicia. *Digital Education Review*, (39), 356–373. <https://doi.org/10.1344/der.2021.39.%25p>
- Valverde-Berrocoso, J., Fernández-Sánchez, M. R., Revuelta Dominguez, F. I., & Sosa-Díaz, M. J. (2021). The educational integration of digital technologies preCovid-19: Lessons for teacher education. *Plos one*, 16(8), e0256283. <https://doi.org/10.1371/journal.pone.0256283>
- Varela, J. J., Guzmán, P., Oriol, X., Romo, F., & Miranda, R. (2023). Teachers' wellbeing, affects, and burnout during the pandemic in Chile. *Revista de Psicodidáctica (English ed.)*, 28(1), 10-18. <https://doi.org/10.1016/j.psicoe.2022.07.001>
- Vázquez-Cano, E., Fombona, J., & Fernández, A. (2013). Virtual attendance: Analysis of an audiovisual over IP system for distance learning in the Spanish Open University (UNED). *The International Review of Research in Open and Distributed Learning*, 14(3), 402–426. <https://doi.org/10.19173/irrodl.v14i3.1430>
- Viberg, O., Mavroudi, A., Khalil, M., & Bälter, O. (2020). Validating an instrument to measure teachers' preparedness to use digital technology in their teaching. *Nordic Journal of Digital Literacy*, 15(01), 38–54. <https://doi.org/10.18261/issn.1891-943x-2020-01-04>
- Wang, Y. (2023). Probing into the boredom of online instruction among Chinese English language teachers during the Covid-19 pandemic. *Current Psychology*, 1–15. <https://doi.org/10.1007/s12144-022-04223-3>
- Wang, Y., Pan, Z., & Wang, M. (2023). The moderating effect of participation in online learning activities and perceived importance of online learning on EFL teachers' teaching ability. *Heliyon*, 9(3). <http://doi.org/10.1016/j.heliyon.2023.e13890>

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