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## Formative Assessment, Communicative Competencies and ICT in Teachers Training

### Evaluación formativa, competencias comunicativas y TIC en formación del profesorado

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### Abstract

The purpose of this study is to analyze the perception of students, graduates, and lecturers in relation to systems of formative and shared assessment and to the acquisition of teaching competences regarding communication and the use of Information and Communications Technology (ICT) in initial teacher education (ITE) on degrees in Primary Teaching Physical Education (PTPE) and Physical Education and Sports Science (PESS). An ad hoc questionnaire was applied to a total sample of 1,243 students, 487 graduates and 345 lecturers from 24 Spanish universities that cover most of Spain's Regional Autonomous Communities. The results from the questionnaires indicate that for all three groups the most relevant element in the assessment process is the teacher-student interaction, and the second most relevant are the competences in interpersonal relationships. Significant differences are also found in practically all the items in the questionnaire between the responses of lecturers and students and between those of students and graduates. In our detailed study of the perceptions of students regarding their competence in ICT, those taking the degree in PTPE perceive a greater use of ICT than those taking the degree in PESS. The same difference was found with students under 22 years of age in relation to the older students. No gender differences were found.



## Resumen

La finalidad de este estudio es analizar la percepción del profesorado, alumnado y egresados en relación a los sistemas de evaluación formativa y compartida y a la adquisición de competencias docentes respecto a la comunicación y al uso de las TIC, en la formación inicial en el Grado de Maestro de Primaria (Educación Física) y en el Grado en Ciencias de la Actividad Física y el Deporte (CCAFD). Se ha aplicado una escala diseñada «ad hoc» en una muestra total de 1.243 estudiantes, 487 egresados y 345 profesores de 24 Universidades españolas que abarcan la mayoría de las Comunidades Autónomas. Los resultados indican que para los tres colectivos el elemento más relevante en el proceso de evaluación es la interacción profesores-estudiantes y, en segundo lugar, las competencias en relaciones interpersonales. También que existen diferencias significativas en prácticamente todos los ítems entre los profesores y los estudiantes y entre estos y los egresados. En el estudio pormenorizado de la percepción de las competencias TIC por parte de los estudiantes, los procedentes del Grado de Maestro de Primaria perciben una mayor utilización de las TIC que los de CCAFD; lo mismo ocurre con los menores de 22 años en relación a los más mayores. No se han encontrado diferencias en función del género.

## Keywords / Palabras clave

Formative assessment, higher education, teacher training, skills communicative, university students, graduate, university teacher.

Evaluación formativa, educación superior, formación profesorado, competencias comunicativas, estudiantes universitarios, egresados, profesorado universitario.

## 1. Introduction

### 1.1. Formative and shared assessment in Higher Education

University teaching demands excellence (European Association for Quality Assurance in Higher Education, ENQA, 2014), for which it is necessary to foster an environment of student participation, involving them in their learning and assessment (Boud & Falchikov, 2007; Brown & Glasner, 2003, Falchikov, 2005, López-Pastor, 2009; Zabalza, 2007). This means that lecturers have to implement changes in their teaching and assessment, an uncommon occurrence in Spanish universities (Zabalza, 2003) although in recent years there have been some notable advances (Fraile, 2006; Palacios & López-Pastor, 2013; Ruè, 2013).

One strategy that has been used increasingly in European countries to support the move towards convergence of practice as required in the European Higher Education Area (EHEA) is for university courses to directly address the development of professional competencies that, in turn, help to establish an appropriate culture of assessment (Dochy, Segers, & Dierick, 2002). This means that courses should incorporate systems of formative and shared assessment (F&SA) aimed at improving, not merely measuring, learning. Formative assessment (FA) involves a process of verification, assessment and decision-making, whose purpose is to optimize the teaching-learning process (López-Pastor, 2009). Shared or co-assessment represents the process of dialogue between the lecturer and their students on the assessment of their learning. Key to this process is communication and how communication channels are established and implemented.

There are a number of basic techniques that can be used to encourage student participation in assessment (López-Pastor, 2009): self-assessment, co-assessment, peer assessment, and shared assessment. They can all be implemented as standard assessment processes for different learning activities. On the other hand, to enable students' participation in the process of grading assessments, we can incorporate self-grading and negotiated grading, both of which should be supported by effective channels of communication.

In recent decades, evidence has emerged from studies, such as those mentioned below, that indicates how the use of F&SA in Higher Education significantly improves the quality of learning as well as the development of competences linked to metacognitive abilities and lifelong learning. F&SA



increases the motivation and involvement of students and provides opportunities for the correction of errors. It represents a learning experience in itself, developing students' responsibility, autonomy, and communication, improving their capacity for self-reflection and academic performance (Boud & Falchikov, 2007; Brown & Glasner, 2003; Falchikov, 2005; Fraile, López-Pastor, Castejón, & Romero, 2013; Knight, 2005; López-Pastor, 2009; Martínez, Santos, & Castejón, 2017; Romero, Fraile, López-Pastor, & Castejón, 2014).

## **1.2. Formative assessment, communication, and the use of ICT**

Formative assessment is a mode of assessment that provides guidance to students and helps them learn. It must therefore be adapted to their needs and be fully integrated into the teaching-learning process (Brookhart, 2007; López-Pastor, 2009; Yorke, 2003). To do this requires effective communication, which enables real progress to be made in learning and in the academic outcomes achieved (Ferguson, 2011, Johnson & Burdett, 2010, Nicol & Macfarlane-Dick, 2006). There are, however, some challenges, both in implementation of strategies that introduce F&SA (Gikandi, Morrow, & Davis, 2011; Li, Xiong, Zang, Kornhaber, Lyu, & al., 2016) and in the type and mode of feedback provided (Evans, 2013). ICT can play an important role in reducing these challenges. The flexibility offered by F&SA in enabling different instruments to be employed means that assessment can be varied and adapted to the context and needs of students (Arazy, Yeo, & Nov, 2013; Capllonch & Castejón, 2007), and it is an important resource for lecturers whose own competence in the use of ICT is crucial in order to ensure the quality of the communicative process (Salinas, 2004).

## **1.3. Communicative skills and use of ICT in Initial Teacher Education (ITE)**

The current academic scenario is focused on the development of competencies (Perrenoud, 2005). Competence-based work requires a coherent teaching-learning approach that entails aligned teaching (Biggs & Tang, 2007), where methodology and assessment form part of the process. It requires a participatory methodology in which students assume responsibility for their learning (Knight, 2005; Rué, 2007), and a learning-centered assessment approach that takes precedence over grading (Ramsden, 2003).

Changes in the use of ICT as a support for teaching has been an important aspect in the training of teachers (Bautista, Borges, & Forés, 2006), as well as in the way students use it (Turner & Croucher, 2014). However, Gutiérrez-Martín and Tyner (2012) warn of two possible dangers: the restriction of media education to the mere development of digital skills, and the reduction of digital skills to their most basic technological and instrumental dimension. To avoid this, they recommend reinstating the most critical and ideological approaches to the development of media literacy and digital competence. Gutiérrez-Martín, Palacios, and Torrego (2010) argue that such changes are not as immediate and beneficial as the dominant discourse makes us believe, and that they actually generate multiple and varied transitional situations that have come to characterize current university education.

In essence, the challenges for teachers and students in implementing F&SA are affected by their own communicative competence and their use of ICT. According to Bullock (2004), teachers' attitudes towards these technologies are one of the main predictors as to whether their use in the teaching process is viewed as positive or negative by their students. Positive attitudes enhance motivation and interest in learning, while negative ones lead to weaknesses in both areas (Albirini, 2006). The simple introduction of ICT within the teaching process does not automatically represent an innovative change (Bates, 2009). What is required are real changes to the roles of both the teachers and the students and as well as changes in the methodology and assessment systems implemented.

Following the implementation of the EHEA, ICT has not been able to maintain its role as the environment in which digital skills are developed. ICT has not been given any greater presence within teacher education degrees (Losada, Valverde, & Correa, 2012). In contrast, students demand to use



in their courses the tools they use most in their daily lives (blogs, instant messaging, social networks...), as has already been shown in the study by Trinder, William, Margaryan, Littlejohn and Nicol (2008).

Various studies indicate the perspectives of lecturers, students, and graduates regarding the use of F&SA during initial teacher education (ITE) with differences of opinion being seen between all three groups (Gutiérrez-García, Pérez-Pueyo, & Pérez-Gutiérrez, 2013; Martínez, Castejon, & Santos, 2014, Martínez & al., 2017, Romero, Castejón, & López, 2015). Although the results of these studies generally show that using formative assessment does deliver considerable improvements, similar improvements are not, however, evidenced in relation to the use of ICT and its role in F&SA. The objective of this study is, therefore, to verify the perception of lecturers, students, and graduates about the use of F&SA and its relationship with the development of teaching competences in the use of ICT in initial teacher education on degrees in Primary Teaching in the specialist areas of Physical Education (PTPE) and Physical Education and Sports Science (PESS).

This current study is part of another wider project, aimed at analyzing the perception of lecturers, students, and graduates on the acquisition of teaching competences and the use of F&SA systems in initial teacher education. In the present study, we will limit ourselves to analyzing the issues that relate to communication and the use of ICT.

## 2. Materials and methodology

### 2.1. Participants

A non-probabilistic sample representing most of the Regional Autonomous Communities in Spain was used. It consisted of participants from 24 Spanish universities, including Alcalá de Henares, Almería, Autónoma de Barcelona, Autónoma de Madrid, Barcelona, Burgos, Castilla la Mancha, Granada, Huelva, La Coruña, Leon, Lleida, Murcia, The Basque Country, Ramón Llul, Salamanca, Cantabria, Seville, Tenerife, UCAM, Valencia, Valladolid, Vic and Zaragoza). They all share the following characteristics: a) university lecturers in initial teacher education (ITE) that have taught on those degree courses in any of the four previous academic years; b) fourth-year students of ITE degrees in 2014-2015; c) graduates of the above-mentioned degree courses from any of the last five academic years (Table 1).

	N	% Gender		% Degree		% Age	
		M	F	PTPE	PESS	<22	>22
<b>Students</b>	1243	56.5	43.5	68.0	32.0	69.8	30.2
<b>Lecturers</b>	345	56.8	43.2	60.4	39.6		
<b>Graduates</b>	487	58.9	41.1	39.0	61.0		

### 2.2. Instruments and materials

An "ad hoc" baseline questionnaire was drawn up, entitled "Teaching competencies in ITE", of which three versions were created, each adapted to the specific participating populations. The competences used for the study were those included in the White Paper on the Degree in Primary Teaching and the Degree in Physical Education and Sports Science (ANECA, 2005a, 2005b). The validation process of the questionnaire was: a) inclusion of a large number of items from the White Papers; b) revision of this first version by a group of 10 university lecturers, experts in Physical Education Didactics, who have participated in research projects on university teaching and have maintained a commitment to frequent publication of their research in specialized Spanish and foreign journals (2 - 3 per year); this resulted in 82 items; c) application of a first pre-test with a group of students to analyze the degree of understanding and relevance, until the final version was arrived at; d) finally,



calculation of the reliability of the instrument using Cronbach's Alpha, obtaining values between .879 and .954.

The final version of the questionnaire consisted of 12 questions and 79 separate items. Questions were asked to identify: a) to what extent the courses studied helped to develop teaching competences; and b) the degree to which participants agreed with statements related to the development of the subject areas. The evaluation was undertaken using a Likert scale with five points of agreement: between 0 (none, nothing) and 4 (a lot, very high). The present paper focuses on the items related to: a) the assessment and communication system; b) competences that require communication skills; and c) competences in the area of ICT.

Item Category	Item Description	Short Title
<b>1. The assessment and communication system</b>	1.1. Assessment tasks are agreed with the students	(Negotiated assessment)
	1.2. Grading is done through peer assessment,	(Grading using peer assessment)
	1.3. Grading is achieved using negotiation and agreement between lecturers and students	(Negotiated grading)
<b>2. Competences that require communication skills</b>	2.1. The interaction between lecturers and students assists the assessment process	(Student-lecturer interaction)
	2.2. Oral and written communication in the native language	(Native language communication)
	2.3. Knowledge of a foreign language	(Knowledge of a foreign language)
	2.4. Competence in interpersonal relationships	(Interpersonal relations)
<b>3. ICT skills</b>	3.1. Knowledge of IT in relation to the subject area	(Specific IT knowledge)
	3.2. Use of Information and Communication Technology	(Use of ICT)

### 2.3. Procedure

The definition of the sample and the application of the questionnaire were undertaken in April 2015. Students and lecturers were given questionnaires in paper format, and graduates were given electronic questionnaire (Google), given the difficulty in accessing this group. The approximate duration for completion was forty minutes. Anonymity was guaranteed by coding the completed questionnaires.

### 2.4. Statistical analysis

Two studies were carried out: a) results by items for the three participant groups: descriptive (Mean and Standard Deviation - SD); and comparisons: ANOVA and multiple comparisons with Bonferroni test applied; b) detailed study of students' responses based on the variables: gender, age and degree, with Student's t test applied, according to the characteristics of our sample. Both Excel\_2007 and SPSS\_v19 programs were used, establishing a significance level of  $p \leq .05$ .

Students (N=1243)	Graduates (N=491)	Students (N=1243)	Graduates (N=491)	F	p
1.1 Negotiated assessment	2.3(1.2)	1.8(1.2)	1.7(1.2)	33.974	.000
1.2 Grading using peer assessment	1.5(1.2)	1.4(1.1)	1.3(1.0)	7.934	.000
1.3 Negotiated grading	1.5(1.2)	1.4(1.2)	1.0(1.1)	21.840	.000
2.1 Student-lecturer interaction	3.6(0.6)	3.2(0.8)	3.5(0.8)	55.410	.000



2.2 Native language communication	2.7(1.0)	2.5(1.0)	2.6(1.0)	10.079	.000
2.3 Knowledge of a foreign language	1.1(1.1)	1.3(1.1)	1.1(1.1)	5.825	.003
2.4 Interpersonal relations	2.9(1.0)	2.8(0.9)	3.0(0.9)	5.884	.003
3.1 Specific IT knowledge	2.0(1.1)	1.8(1.1)	1.9(1.1)	7.453	.001
3.2 Use of ICT	2.6(1.0)	2.3(1.1)	2.3(1.1)	11.479	.000

### 3. Analysis and results

#### 3.1. Results for students, graduates, and teachers

The interval within which the mean scores of all three groups varied in each of the items did not exceed six decimal places, except for the single item "Negotiated assessment" (1.1. Table 3).

For all three items relating to "Assessment and communication system", there were low values in general from students as well as from graduates and lecturers. The highest scores were for "Negotiated assessment", the lecturers' scores being the highest, followed by graduates' and students' scores. The same order was repeated in "Grading using peer assessment" and in "Negotiated grading", with the scores from the graduates the lowest of the whole study.

As for the block "Competences requiring communicative skills", the item "Student-lecturer interaction" obtained the highest mean scores in the study for all three groups. For the other three items, the one with the highest scores from all three groups was "Interpersonal relations". All three groups scored it more highly than "Native language communication" with this item scoring higher than "Knowledge of a Foreign Language".

In the ICT skills section, all three populations scored the "Use of ICT" more highly than "Specific IT knowledge".

From the analysis of variance in each of the items it was found that there were significant differences between lecturers, students, and graduates (Table 3).

From the data of the ANOVAs, multiple comparisons (Bonferroni) were made to identify between which groups the differences occurred (Table 4). Of the 27 possible combinations, differences were found in 18 of them. Of the remaining nine, five were in the binomial graduate-lecturers (items 2.1 to 2.4 and 3.1); three in student-lecturers (1.2, 2.4 and 3.2); and one in student-graduates (3.1) (Table 4).

Dependent Variable	Bonferroni		
<b>1.1. Negotiated assessment</b>	Student	Graduate	.038
		Lecturer	.000
<b>1.2. Grading using peer assessment</b>	Graduate	Lecturer	.000
	Graduate	Lecturer	.000
<b>1.3. Negotiated grading</b>	Student	Graduate	.000
		Lecturer	.045
	Graduate	Lecturer	.000
<b>2.1. Student-lecturer interaction</b>	Student	Graduate	.000
		Lecturer	.000
<b>2.2. Native language communication</b>	Student	Graduate	.017
		Lecturer	.000
<b>2.3. Knowledge of a foreign language</b>	Student	Graduate	.019
		Lecturer	.025
<b>2.4. Interpersonal relations</b>	Student	Graduate	.002
<b>3.1. Specific IT knowledge</b>	Student	Lecturer	.000
		Graduate	Lecturer
<b>3.2. Use of ICT</b>	Student	Lecturer	.000
		Graduate	Lecturer



For the items in the "Assessment and communication system" category, (1.1 to 1.3, Table 3), the ANOVA showed significant differences between all three. In subsequent multiple comparisons (Table 4), significant differences were found in all possible combinations except for one. In the student-graduate binomial, differences appeared in all three cases ( $p=.038$ ,  $p=.002$ , and  $p=0$ ). In graduates-lecturers this was also the case ( $p=0$  in all three cases), while in the student-lecturer binomial there were significant differences in "Negotiated Assessment" ( $p=0$ ) and "Negotiated grading" ( $p=.045$ ), but there were discrepancies in "Grading using peer assessment".

Regarding the block of items "Competences that require communication skills" (items 2.1 to 2.4, Table 3), differences were found in all four items ( $p=0$ ,  $p=0$ ,  $p=.003$ ;  $p=.003$ , respectively). Subsequently the three groups were compared in order to identify where the differences occurred (Table 4). For the item "Student-lecturer interaction" they were found between the students and the other two groups ( $p=0$ , in both cases). In the case of "Native language communication", students' scores differed from graduates' ( $p=.017$ ) and from lecturers' ( $p=0$ ), and the same happened with "Knowledge of a foreign language" ( $p=.019$  and  $p=.025$ , respectively). In "Interpersonal relations", the significant differences were only found between students and graduates ( $p=.002$ ).

In summary, multiple comparisons showed significant differences between students and the other two groups in all items in this block, with the exception of "Interpersonal relations", in which students' scores only differed from the graduates'.

Regarding the competences (3.1 and 3.2) referred to in the third block of items studied, "ICT Skills" (Table 3), significant differences were found in both cases ( $p=.001$  and  $p=0$ ). These were (Table 4) between students and lecturers in both cases ( $p=0$ ), as well as between graduates and lecturers in "Use of ICT" ( $p=.002$ ).

A second in-depth study was carried out in relation to "ICT Skills" among students, according to gender, age, and degree (PTPE vs PESS). After applying the Student's t-test to two independent samples, no significant differences were found for either gender or age. In terms of the degree studied, Student's t-test was also applied. The Levene test yielded a value lower than .05, so different variances were assumed. Significant differences ( $p=.003$ ) were found between students of PTPE and students of PESS with the former's values being higher (Table 5).

**Table 5. Means, DT, Levene and Student's t test in relation to the degree taken by the students**

	Degree	N	Mean	DT	Levene test		t test for the equality of means		
					F	Sig.	t	gl	Sig.(bilateral)
3.2_Use of ICT	PTPE	854	2.3	1.1	6.287	.012	2.931	744.876	.003
	PESS	372	2.1	1.0					

In the case of differences between students as a function of age, the Student's t-test was applied to two independent samples. The Levene test yielded a value lower than .05 so different variances were assumed. The results showed significant differences between the groups only in the item "Use of ICT", with the younger students producing higher values (Table 6).

**Table 6. Means, DT, Levene and Student's t test in function of the students' age**

	Age	N	Mean	DT	Levene test		t Test		
					F	Sig.	t	gl	Sig.(bilateral)
3.2_Use of ICT	<22	269	2.4	1.0	3.069	.08	2.643	472.717	.008
	>22	932	2.2	1.1					

## 4. Discussion and conclusions

The present study reveals differences in the perceptions of students, graduates, and lecturers involved in certain degree courses in ITE for Physical Education in Spain, regarding the degree to which communication and ICT skills are acquired on these courses, and regarding certain aspects of the assessment in which communication is a key factor.



With regard to the aspects of communication that can influence the use of F&SA (the first block of items considered), there were significant differences in the responses from the three populations, with the highest average always coming from lecturers and the lowest from graduates. The results were low, both for "Negotiated grading" and for "Grading using peer assessment", and somewhat higher for «Negotiated Assessment». The lecturers agreed with the students regarding the minimal use of co-assessment, and scored the use of "Negotiated grading", and, in particular, "Negotiated assessment", more highly than students and graduates, in line with Gutiérrez-García and others (2013), López-Pastor (2009) and Romero and others (2015). It is possible that, although lecturers may believe that their performance has evolved and improved (Gutiérrez-García & al., 2013), students and graduates consider that certain practices, in which communication is important, are not implemented effectively. However, the differences found between students and graduates reinforce the tendency found in other studies (Palacios & López-Pastor, 2013) that F&SA practices are evolving positively in Spanish universities.

As for the category "Competencies that require communication skills", all populations agreed strongly that "lecturer-student interaction" enhances the assessment process (a highly-valued item in the study). This is a very positive aspect, given that many authors maintain that the participation of students in their education and assessment is key to the development of their competencies (Brown & Glasner, 2003; Zabalza, 2007), especially in ITE (Palacios and López, 2013; Hamodi, López-Pastor, & López-Pastor, 2017), and helps to achieve the excellence referred to in the ENQA (2014). However, these results do show some inconsistency in the low values given to "Negotiated Assessment" and "Negotiated grading", both of which require student-lecturer interaction.

The next most highly rated item of the second block was "Interpersonal relations". All three groups agreed that ITE significantly improves this competence, and it is the only item in the whole study in which the scores from graduates were greater than those from the lecturers. This may be because, as newly active professionals, they place greater value on a competence that has proven to be very important in their professional practice, since it helps to develop socio-affective skills in order to interact with students, their fellow lecturers, and other socio-educational agents (Aparicio & Fraile, 2016). In addition, these results coincide with Abarca, Marzo and Sala (2002), who focus on the presence of emotional competencies in initial teacher education. As well as with the study by Aparicio and Fraile (2016), carried out with ITE students in which skills that foster interpersonal relationships (the teacher's ability to empathize, as well as to recognize their own feelings and emotions) are the most highly valued.

The competencies related to "Oral and written communication in the native language" represented the third most highly valued item by all three groups. In the case of the students, in accordance with the study by Hermosilla, Clemente, Trinidad and André (2013), in which students considered oral expression to be a very useful tool for their future professional life. The scores of the lecturers and graduates were higher than those of the students, probably influenced by their involvement in the workplace, as mentioned above. The scores of the lecturers exceeded those of the students, which is common in studies on the perception of competency development in ITE (Almerich, Suárez-Rodríguez, Belloch, & Bo, 2011).

The item "Knowledge of a foreign language" produced the lowest mean scores of the second block and of the entire study. These results indicate that ITE in Spanish universities has not yet fully incorporated the use of foreign language skills required within the new multicultural context (De-Pablos, 2010), although it is moving towards a progressive implantation of English language study. Student mobility has also experienced a notable increase within Spanish universities, which is an important factor in continuing to effect valuable structural modifications (Belvis, Pineda, & Moreno, 2007).

With regard to the acquisition of "Competences in the area of ICT", the scores for "Specific IT skills" were medium-low and medium for the "Use of ICT" in general. These results contrast with the fact that both lecturers and students consider ICT skills as key to improving teaching and learning processes (Pino & Soto, 2010). A competency-based system "cannot be developed through the mere transmission of knowledge" (Gutiérrez-Martín & al., 2010: 165). Rather, it is necessary to use didactic resources to deliver formative assessment and continuous and effective feedback (Torrance, 2012),





in which ICT plays a crucial role. As Ferguson (2011) points out, the appropriate use of communication and feedback offered to Physical Education students can lead to important advances in their learning and academic achievement. On the other hand, however, Gutiérrez-Martín and others (2010) suggest that the impact of ICT in Higher Education is being overestimated.

Regarding the item "Use of ICT", the results showed significant differences between students' and lecturers' scores, as well as between graduates' and lecturers' scores. In both cases, the highest perception was that of the lecturers, representing an habitual discrepancy, as mentioned above. Students' scores were the lowest, unlike in the study by San-Nicolás and others (2012), whose students state that they have sufficient skills in using ICT. Although there is a general perception that all students are experts in ICT, the evidence does not seem to support this. On this issue, Kirkwood and Price (2005) point out that very few have high skill levels in the use of applications. Furthermore, Gutiérrez-Martín and others (2010) question the myth that ITE students are digital natives and, in any case, there seems to be a wide disparity in literacy levels (Lorenzo, Oblinger, & Dziuban, 2006). On the other hand, this raises questions of why, in spite of the generalized spread of platforms like Moodle, Blackboard, etc., levels of competence in the use of ICT are not more highly valued. In their study, Losada, Valverde and Correa (2012) do not identify any increase in the presence of ICT in ITE courses since the introduction of the EHEA. However, as indicated above, students demand the introduction of the usual tools they use in their daily life. One reason for this may be the attitude of lecturers to the use of ICT, which strongly influences students' acceptance or rejection of ICT in teaching processes (Bullock, 2004). However, changes in the role of the lecturer, the role of the students, the methodology and the assessment system are all necessary, since the introduction of ICT in teaching activity alone does not represent an innovative change (Bates, 2009).

The second stage of analysis of the results focused on the students as a group and their perception of the acquisition of competences in the use of ICT during their ITE. No significant differences were detected in terms of gender, which contradicts other studies which do find differential aspects, suggesting a "digital gender gap" (Gil-Juárez, Feliu, & Vitores, 2012), which is a matter of concern in the academic world.

In relation to the degree studied, there were significant differences for the item "Specific IT skills", for which the students of PESS gave lower scores. One possible explanation is the one suggested by Maquilon and collaborators (2013), that students of social and legal sciences consider ICT skills as essential, taking first place in the list of important "macro areas" on their courses with 38.2%, while in the area of health sciences this declines to 13.9%.

Finally, in terms of age, differences were only established for the item "Use of ICT", where higher values were found among students below 22 years of age. This coincides with the results of the study by Maquilon and others (2013), in that age is a factor in terms of students' perception of their competence in ICT.

In conclusion, the results demonstrate the existence of differences in the perception of lecturers, students, and graduates of ITE and Physical Education degrees regarding the acquisition of teaching competences related to F&SA, communication and the use of ICT. These results indicate an important path for future development in ITE. The main suggestions are as follows:

- a) There is a gap between the assessment systems that relevant literature considers as the best way to generate learning and competences in ITE and what predominates in reality. Therefore, it seems important to insist on ever greater implementation of F&SA systems within these courses.
- b) We suggest that greater emphasis should be placed on the development of competences linked to interpersonal relations in ITE for Physical Education, as they are often forgotten or diluted in many subject areas, although they are actually the competencies most highly valued by graduates in their professional practice.
- c) Because of their importance in professional practice, the presence of competences that relate to "oral and written communication" should be prioritized in all ITE courses, as they are in courses where other languages, such as corporal, are very relevant.



d) There seems to be a wide disparity in the digital literacy levels of ITE for Physical Education students. It would therefore be advisable to incorporate more opportunities for the use of and changes to the way digital skills are developed in ITE for Physical Education.

We believe that this current article may be of great interest to university lecturers involved in ITE and, more specifically, to those interested in research into the use of ICT in ITE, as well as to those who research into F&SA systems within higher education.

In future studies, it will be important to undertake research to a) identify methodological strategies and practices in the design and use of ICT for teaching staff at all levels within education; b) analyze good practice in the development of new technologies within educational contexts; and c) verify how ICT skills can be transferred to real professional practice within educational establishments.

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