

# Languages and ICT: teaching skills for the 21st century. A comparative analysis with other professions

## Idiomas y TIC: competencias docentes para el siglo XXI. Un análisis comparativo con otras profesiones

DOI: 10.4438/1988-592X-RE-2021-393-498

Agustín Rodríguez-Esteban  
Diego González-Rodríguez  
Héctor González-Mayorga

*Universidad de León*

### **Abstract**

In response to new social demands, the current educational model has placed the mastery of languages and ICT as two of the most significant teaching skills. The aim of this study is to describe, from a comparative perspective with other occupational groups, the extent to which teachers have acquired these competencies and the ongoing training associated to them. We also analyse the relevance of these competencies for these professionals to access the labour market. An ex post-facto descriptive-comparative and cross-sectional study was carried out. We used data from the Labour Insertion Survey of University Graduates, EILU 2019, which collects data from a large sample of graduates from Spanish universities. The results show that, although the teachers present a higher level of both competences than the rest of the professionals of the social welfare system, the values are lower than those reported by STEM professionals. The high interest of teachers in permanent training, especially in the field of languages, is particularly noteworthy. The labour market of the Spanish education system points to language and ICT training as relevant recruitment factors, to a greater extent than the other labour sectors described. However, this market places more importance on other 'traditional' skills such as theoretical knowledge and practical skills. The university system, responsible for the pre-service teachers' training, must improve its capacity, not only to provide them

with a higher level in the skills described, but also for graduates to be able, in the future to incorporate them effectively into their teaching-learning processes.

*Key words:* teaching skills, information and communication technologies (ICT), second language learning, employability, lifelong learning, higher education.

### **Resumen**

Tratando de dar respuesta a las nuevas demandas sociales, el modelo educativo actual ha situado al dominio de idiomas y TIC como dos de las competencias docentes más significativas. El objetivo del presente estudio es describir, desde una perspectiva comparativa con otros grupos ocupacionales, el grado de adquisición de estas competencias por parte de los maestros, y la formación permanente asociada a ellas. Se desarrolla un análisis, también, de la relevancia que tienen dichas competencias para el acceso al mercado laboral de estos profesionales. Se ha llevado a cabo un estudio ex post-facto de tipo descriptivo-comparativo y de carácter transversal. Se han utilizado datos de la Encuesta de Inserción Laboral de los Titulados Universitarios, EILU 2019, que recoge datos de una amplia muestra de egresados en universidades españolas. Los resultados ponen de manifiesto que, si bien los maestros presentan un nivel en ambas competencias más elevado que el resto de profesionales del sistema de bienestar social, los valores son inferiores a los expresados por los profesionales STEM. Se destaca el elevado interés de los docentes por la formación permanente, especialmente en el ámbito de los idiomas. El mercado laboral del sistema de enseñanza considera la formación en idiomas y TIC factores de contratación relevantes, en mayor medida que lo hacen los otros sectores laborales descritos. No obstante, este mercado da más importancia a otras competencias 'tradicionales' como los conocimientos teóricos y las habilidades prácticas. El sistema universitario, responsable de la formación de los maestros, debe mejorar su capacidad, no solo para dotar a estos de un mayor nivel en las habilidades descritas, sino también para que, en el futuro, los egresados sean capaces de incorporarlas en sus procesos de enseñanza-aprendizaje de forma eficaz.

*Palabras clave:* competencias docentes, tecnologías de la información y la comunicación (TIC), aprendizaje de un segundo idioma, empleabilidad, formación permanente, educación superior.

## **Introduction**

In recent decades, the new social model, derived especially from the development of information technology and globalisation (Castells, 2006),

has demanded new competences from citizens, among which language and digital competences stand out. The ability to use computer tools collaboratively and critically, as well as the use of languages, especially English, an international communication standard, have become important indicators of employability (Martín del Peso et al., 2013; Rodríguez-Esteban et al., 2019). These competences also favor coexistence under conditions of equality (Council of the European Union, 2014).

Regarding language skills, the Social Summit held on November 17, 2017 set an ambitious goal: by 2025, European citizens will be able to speak two languages in addition to their mother tongue (European Commission, 2017). On the other hand, recently the European Digital Competences Framework for Citizens (DigComp) has positioned digital competence as a key transversal competence needed by citizens, stating that they should be able to use digital technologies in a critical, collaborative, and creative way (European Commission, 2020).

The education system, as the body responsible for the education of these citizens, faces the challenge of adapting its teaching and learning processes to respond to this new reality (Council of the European Union, 2018). However, this requires a change in the professional profile of those responsible for this training: teachers (Eurydice, 2005). Teaching competences, those that enable these professionals to carry out their work adequately and to meet the demands of their job (Council of the European Union, 2014; Jover, et al., 2016), must evolve at the same pace as the education system and social demands. Scriven (1994) was the first author to establish a classification of teaching competences, organising them into four main groups: subject knowledge, instructional competences, evaluative competences, and professional competences. This classification has undergone changes over the years, acquiring greater depth and breadth in its development by contemplating aspects such as teamwork, ICT management, and in-service teacher training (Perrenoud, 2004). Following in this line, Marina et al. (2015) adapted and updated, in the White Paper on the Teaching Profession and its School Environment, the contributions of Perrenoud (2004) to the demands of current education. In it, some novelties were included, such as the adaptation of multicultural environments, bilingualism, and conflict resolution.

From the point of view of the acquisition of these competences, there is no doubt that their acquisition should begin in the period of initial teacher

training. In this respect, the creation of the European Higher Education Area (EHEA) marked an important turning point by establishing the need to integrate professional competences and their acquisition by students into the curricula leading to an official university degree (Royal Decree 1393/2007). This requirement has led to the inclusion in compulsory initial training of subjects linked to a second language and ICT training (Pesquero et al., 2008). About language competence, Spanish universities have shown great interest in the acquisition of a second foreign language by their students, with English being the most in demand (Halbach et al., 2013). This is due, on the one hand, to the consideration of English as a *lingua franca* (Coleman, 2006) and, on the other, to the emergence of bilingual sections in Spanish schools (Jover et al., 2016).

For the development of this competence, level B1 of the Common European Framework of Reference for Languages (Halbach et al., 2013) has been taken as a reference level, this being a key EU language document (Council of Europe, 2001). Regarding digital literacy training, the World Education Report (UNESCO, 1998) warned, more than two decades ago, of the impact that ICT would have on teaching and learning processes and of the need for teacher training in this area. Those the social impact caused by the COVID-19 health crisis has reaffirmed this need to be digitally competent and to become proficient in various tools that help improve the quality of teaching (Babatunde & Soykan, 2020; Cifuentes-Faura, 2020).

Despite this, there are many studies that consider that in-service training is either insufficient or not adapted to current demands (Alfageme-González & Miguel, 2017; Alonso, 2016; Escudero et al., 2018; Eurydice, 2015; Guarro et al., 2017). The recent Teaching and Learning International Survey (TALIS) report has found, in this regard, that the use of ICT and teaching in multicultural and multilingual environments are two of the main professional development needs demanded by teachers, both in Spain and in the international context (OECD, 2020). Therefore, we can assume that, for the development of these competences to be effective, it is crucial for education systems to be committed to ongoing teacher training, a clear indicator of the quality of teaching activity (Ministry of Education and Vocational Training, 2019). In this regard, in 2002, the Council of the European Union stated the importance of “the training, recruitment and updating of teachers and trainers for the development of lifelong learning” (Council of the European Union, 2002, p. 2).

This has led us to set out the first specific objective of our research, aimed at describing the degree of acquisition of the competences of *language knowledge* and *ICT skills* that early childhood and primary education professionals claim to possess, as well as the in-service training related to these two competences.

On the other hand, despite the relevance of these competences today, there is little research analysing their influence on teachers' access to the labour market (Martínez-Losada et al., 2017). Accordingly, we set out a second objective focused on analysing the extent to which these competences are considered relevant recruitment factors in the process of accessing the labour market for teachers.

To obtain a reference that allows us to make a more precise judgement, the study has been approached in a comparative way. The results obtained by the teachers were compared with two groups of scientific and intellectual professionals: a) other professionals in the social welfare system, and b) STEM professionals (see Method section).

## Method

An ex post facto comparative descriptive cross-sectional study was carried out using survey data.

### Sample: data and participants

For this research we have used data from the Labour Market Insertion Survey of University Graduates 2019, prepared by the National Statistics Institute (hereinafter INE). This is the second national survey carried out by the INE, and its objective is to ascertain relevant aspects of the transition process of university graduates into the labour market. The sample was made up of graduates from Spanish universities in 2013 and 2014, as it was considered that a period of around three years from the end of their studies was necessary to stabilise their relationship with the labour market. Data collection was carried out between July and December 2019. The database was completed with administrative data from, among other sources, the Integrated University Information System, and the General Treasury of the Social Security (INE, 2020).

The work sample for this study has been delimited to Scientific and Intellectual Professionals, group 2 of the National Classification of Occupations 2011 (INE, 2012). This classification system has been used by the INE in the categorisation of the survey data relating to occupations in accordance with Royal Decree 1591/2010, of 26 November, approving the National Classification of Occupations 2011. This is the latest revision of the International Standard Classification of Occupations (ISCO-prepared by the International Labour Organisation (ILO, 2008). The tasks and duties of professionals in this category were framed within the framework of competence level 4, defined as a level that requires the “performance of tasks that require decision-making and complex problem- solving based on extensive theoretical and practical knowledge in a given area” (INE, 2012, p. 6). The selection of observation units has been limited to this category since, on the one hand, this is the category in which early childhood and primary school teachers, the target group of this research, are placed and, on the other hand, the competences required in this category are obtained after completing higher education studies leading to the “award of a first diploma or higher qualification (ISCED 97 level 5 or higher)” (INE, 2012, p. 6). In this way, the comparison groups are intended to be made up of professionals working at the same level of qualification and competence development as teachers.

The final working sample consisted of a total of 8349 university graduates. Considering the comparative nature of this study, 3 analysis groups were formed:

- Teachers: Graduates whose description of the occupation of current main job falls under the category *early childhood, primary, secondary, and post-secondary education professionals*, CNO-11 code 22, and who also completed studies in early childhood education and/or primary education.
- Other professionals in the welfare and social intervention system (*other WS professionals*): University graduates whose work is in other professional areas of the social welfare system, specifically health professionals and professionals in social intervention and social services (Fantova, 2019). In the first case, we have chosen those professionals whose main occupation falls within category 21 of the CNO-11, *health professionals*, and whose university degree is in the Health Sciences branch. In the case of social intervention and social services professionals, we have selected graduates whose

main occupation falls under code 28 of the CNO-11, *professionals in social sciences*, and who have obtained one of the following degrees: Social Work (code 092301); Social Education (code 011901); Psychology (code 031301); Pedagogy (code 011101); and Sociology and Gender Equality (code 031406).

- STEM professionals (acronym for *Science, Technology, Engineering, and Mathematics*). This group has been considered as a benchmark because it has a very well-defined professional profile, not only in terms of technological training (Simó et al., 2020), but also in terms of English proficiency, a demand conditioned, to a large extent, by its higher rate of international mobility (Herrera, 2014). This group has been formed by selecting those subjects whose main occupation falls within the *professional* categories of *physical sciences, chemistry, mathematics, and engineering* or *information technology professionals*, and who completed university studies in the field of engineering and architecture (code 4).

Table I shows the distribution of the sample according to demographic characteristics.

TABLE I. Descriptive profile of the sample.

Categoría ocupacional	N° of subjects	Sex	Age
Teachers	1802	Women: 81.5% Men: 18.5%	< 30 years: 46% ≥ 30 years: 54%
Other professionals S.W.	3817	Women: 73.7% Men: 26.3%	< 30 years: 57.2% ≥ 30 years: 42.8%
STEM professionals	2730	Women: 31.3% Men: 68.7%	< 30 years: 36.8% ≥ 30 years: 63.2%
Total	8349	Women: 61.5% Men: 38.5%	< 30 years: 48.1% ≥ 30 years: 51.9%

## Variables analysed

Three groups of variables were used (see Table II). The first group includes the respondents' stated level in the two skills analysed: languages, with English selected as a language other than the mother

tongue, and ICT (questions with codes B36 and B37 in the questionnaire). The categories used are: *high level* (subjects who understand a large number of complicated texts in English and use the language flexibly as a language other than their mother tongue); *medium level* (subjects who understand the essentials in everyday language and write simple texts in English); and *low or no level* (subjects who understand and use only the most common expressions or do not indicate English as a second language other than their mother tongue). The categories used in the *ICT skills* variable are: *advanced level* (users who know how to write macros, program, solve software, and hardware problems); *intermediate level* (users who know how to format texts, use advanced formulas and create graphics in spreadsheets, use databases and install devices and/or programmes); and *basic level* (users who surf the Internet, know how to send e-mails, copy or move files or folders, write text in a word processor, and use simple formulas in spreadsheets).

The second group of variables describes lifelong learning in these skills. We used the question in the questionnaire that measured the completion of language or computer courses as a means of improving professional qualifications or job opportunities (code B38). This generates two dichotomous variables with the following response categories: 1 *Yes, they have taken courses*; and 2 *No, they have not taken courses*.

Finally, the third group of variables, recruitment factors, describes the influence of certain skills as a means of obtaining the current job. Question code D.22 was used, which measures the influence of 5 skills on a 5-value Likert scale.



TABLE II. Variables used

Variable	Name	Categories
<b>Competences. Manifested level</b>		
English	V_NIVING	High Medium Low-nil
ICT management	V_NIVTIC	Advanced Intermediate Basic
Lifelong learning. Courses received		
Languages	V_FORIDI	Yes No
Computing	V_FORINF	
<b>Recruitment factors</b>		
Languages	V_CIDIO	Likert scale (1 <i>Not at all</i> , 2 <i>Notvery much</i> ,
Computer and ICT training or proficiency	V_CTIC	
Theoretical knowledge	V_CTEOR	
Practical skills	V_CPRAC	
Personal and social competences (personality, social skills, communication, ability to work in a group)	V_CPER	3 <i>Somewhat</i> , 4 <i>Quite a lot</i> , and 5 <i>Very much</i> )
Technical skills (managerial, planning and entrepreneurial skills)	V_CTEC	

## Procedure: Data analysis

The statistical analysis programme SPSS v26 was used. The descriptive mean and standard deviation were presented, as well as the percentages of the different variables. For comparisons between groups, contingency analyses were carried out for qualitative variables, using the  $\chi^2$  statistic to test the hypothesis of independence of each pair of variables. Where associations existed, the nature and direction of the association was interpreted through the analysis of the corrected standardised residuals. We worked at a confidence level of 95%, so that residuals with a value greater than  $\pm 1.96$  indicated a statistically significant difference between the expected and observed frequency in that cell (López-Roldán & Fachelli, 2018). Only the percentages of those cells that revealed a significant difference between the observed and expected frequency have been interpreted.

In the case of the differences between occupational categories in the recruitment factors, a Likert-type variable, a one-factor ANOVA was used (significance level  $\alpha < 0.05$ ). Although there is no clear consensus in the literature on the level of measurement of these scales, we have adopted the idea of Bisquerra and Pérez Escoda (2015), who point out that: “the psychometric theory of Likert scales assumes that they are interval or ratio scales” (p. 135). To test the significance of the differences between each pair of occupational categories, a post hoc analysis was performed using the Bonferroni correction. The following tests were applied to measure the effect size: in the contingency analysis, Cramer’s V and Phi Coefficient, in 2x3 and 2x2 tables, respectively. In the analysis of variance, partial  $\eta^2$  and  $d$  were applied for the post hoc tests.

## Results

### English and ICT skills

First, we analysed the differences between the level of English proficiency expressed by teachers and the two occupational groups described in this study (other welfare professionals and STEM professionals). Table III shows the percentages for each pair of variable categories together with the corrected standardised residuals and the results of the test of independence for each comparison. The association between occupational group and level of English was statistically significant in both cases, although with a low effect size ( $\chi^2 = 105.144$ ,  $p < 0.000$ ; Cramer V = 0.137, in the comparison with other welfare professionals, and  $\chi^2 = 107.283$ ,  $p < 0.000$ ; Cramer V = 0.154, in the comparison with STEM professionals). Analysis of the residuals revealed, however, differences in the direction and nature of this association. The proportion of teachers expressing a high level of English proficiency was significantly higher than that expressed by all other welfare professionals (39.8% vs. 26.6%). The association was also significant when looking at the categories at the other end of the scale. 24.15% of the professionals working in the other social welfare fields expressed a low or non-existent level of English. For teachers, this percentage was reduced to 17.5%.

In the comparison with STEM professionals, it was observed that more than half of the professionals, whose occupation falls within

these disciplines, reported a high level of English (54.9%). In the case of teachers, the percentage dropped by 15 points (39.8%). Compared to 17.5% for teachers, only 10.8% of STEM professionals expressed a low or non-existent development of this competence.

TABLE III. Differences in the level of English.

Occupational category-group	Level of English		
	High	Medium	Low-Nil
Teachers	39.8% 10.0**	42.6% -4.7**	17.5% -5.5**
Other professionals S.W.	26.6% -10.0**	49.4% 4.7**	24.1% 5.5**
Total	30.8%	47.2%	22.2%
$\chi^2 = 105.144, p < 0.000; \text{Cramer } V = 0.137$			
	High	Medium	Low-Nil
Teachers	39.8% -10.0**	42.6% 5.7**	17.5% 6.5**
STEM professionals	54.9% 10.0**	34.2% -5.7**	10.8% -6.5**
Total	48.9%	37.6%	13.5%
$\chi^2 = 107.283, p < 0.000; \text{Cramer } V = 0.154$			

In each cell, the percentage distribution of the variable *Level of English* in each of the occupational groups is presented, together with the corrected standardised residuals. For corrected standardised residuals: \*\*  $p < 0.05$

Table IV shows the results of the analysis of the ICT management variable, according to the opinion of the respondents themselves. A first observation in the table refers to a relevant fact: the high concentration of teachers (and of the rest of the professionals in the social welfare system) in the intermediate level category. Almost 70% of the teachers expressed this opinion.

The analysis, set out in a similar way to the previous case to examine differences between occupational groups, revealed a statistically significant association between the two variables ( $\chi^2 = 10.517, p = 0.005$  for other professionals in the social welfare system, and  $\chi^2 = 1279.207, p < 0.000$  for the comparison with STEM professionals). The standardised residuals showed that, in relation to the level of English declared, the

differences in this competence are reduced with other professionals in the social welfare system but are much higher when compared to STEM professionals. Thus, it can be observed that 7.8% of teachers reported advanced ICT skills. This percentage decreased slightly, but significantly, by 1.5 percentage points for other professionals in the social welfare system (6.3%).

When the comparison was made with STEM professionals, it was found not only that these graduates showed a greater command of this competence, but also that there were higher differences than in the previous analysis. A total of 54.6% of these professionals expressed an advanced level of this competence, a much higher percentage than that of the teachers (7.8%). The effect size was, moreover, notably larger in the latter case (Cramer V = 0.532 vs. 0.043).

TABLE IV. Differences in the use of ICT

Occupational category-group	ICT management		
	Advanced	Intermediate	Basic
Teachers	7.8% 2.1**	69.2% -3.1**	23.0% 2.1**
Other professionals S.W.	6.3% -2.1**	73.2% 3.1**	20.5% -2.1**
Total	6.8%	71.9%	21.3%
$\chi^2 = 10.517, p < 0.005; \text{Cramer } V = 0.043$			
	Advanced	Intermediate	Basic
Teachers	7.8% -32.1**	69.2% 16.7**	23.0% 23.4**
STEM professionals	54.6% 32.1**	43.8% -16.7**	1.6% -23.4**
Total	36.0%	53.9%	10.1%
$\chi^2 = 1279.207, p < 0.000; \text{Cramer } V = 0.532$			

The percentage distribution of the *ICT Management* variable in each of the occupational groups is presented in each cell, together with the corrected standardised residuals. For corrected standardised residuals: \*\* p<0.05

## Lifelong learning in languages and ICTs

A second block of variables measured respondents' lifelong learning in the two competences covered by this research. For the comparative analyses, contingency tests were designed and, as in the previous case, since the hypothesis of independence was rejected in all cases, corrected standardised residuals were analysed to check the nature and direction of the association.

In relation to languages and looking at the comparison between teachers and the rest of the professionals in the social welfare system, the data in Table V show a significant association between occupational group and lifelong learning, measured through the completion of language courses with a low effect size ( $\chi^2 = 235.024$ ,  $p < 0.000$ ; Phi Coefficient = 0.205). More than half of the teachers, 57.5%, took such courses, a percentage that was reduced to 35.8% in the case of health and social intervention and social services professionals, subgroups that made up the category of other professionals in the social welfare system. As this is a 2x2 table, the percentage difference was maintained, albeit in the opposite direction, in the analysis of the other category (*has not taken training courses*).

The hypothesis of independence of variables was also rejected in the case of the comparison with STEM professionals ( $\chi^2 = 19.930$ ,  $p < 0.000$ ; Phi coefficient = 0.066). Observation of the residuals indicated that language course completion appears in a significantly higher proportion in the case of teachers compared to STEM professionals (57.5% vs. 50.7%).

TABLE V. Languages. Differences in lifelong learning according to occupational groups

Occupational category-group	Language courses	
	Yes	No
Teachers	57.5% 15.3**	42.5% -15.3**
Other professionals S.W.	35.8% -15.3**	64.2% 15.3**
Total	42.8%	57.2%
$\chi^2 = 235.024, p < 0.000; \text{Phi Coefficient} = 0.205$		
	Yes	No
Teachers	57.5% 4.5**	42.5% -4.5**
STEM professionals	50.7% -4.5**	49.3% 4.5**
Total	53.4%	46.6%
$\chi^2 = 19.930, p < 0.000; \text{Phi Coefficient} = 0.066$		

In each cell the percentage distribution of the variable *Language courses* in each of the occupational groups is presented, together with the corrected standardised residuals. For corrected standardised residuals: \*\*  $p < 0.05$

Table VI presents the differences between occupational groups in ICT lifelong learning as measured by the completion of computer courses. The two comparisons made revealed, as in the previous cases, a statistically significant association with low effect size in both cases ( $\chi^2 = 70.635, p < 0.000; \text{Phi Coefficient} = 0.112$ , in the comparison with other professionals in the social welfare system, and  $\chi^2 = 27.384, p < 0.000; \text{Phi Coefficient} = 0.078$  in the comparison with STEM professionals). Teachers expressed a higher degree of lifelong learning than other professionals in the social welfare system. Almost one in four teachers (22.7%) took computer courses. In the case of welfare professionals, the percentage was 13.8%.

The direction of this association was reversed when teachers' in-service training in this area was compared with STEM professionals. STEM professionals undertook this type of training in a higher proportion than teachers. The difference between the two groups was 7 percentage points (29.7% for STEM professionals versus 22.7% for teachers).

**TABLE VI.** Informatics. Differences in lifelong learning according to occupational groups.

Occupational category-group	Computer courses	
	Yes	No
Teachers	22.7% 8.4**	77.3% -8.4**
Other professionals S.W.	13.8% -8.4**	86.2% 8.4**
Total	16.6%	83.4%
$\chi^2 = 70.635, p < 0.000; \text{Phi Coefficient} = 0.112$		
	Yes	No
Teachers	22.7% -5.2**	77.3% 5.2**
STEM professionals	29.7% 5.2**	70.3% -5.2**
Total	26.9%	73.1%
$\chi^2 = 27.384, p < 0.000; \text{Coefficient Phi} = 0.078$		

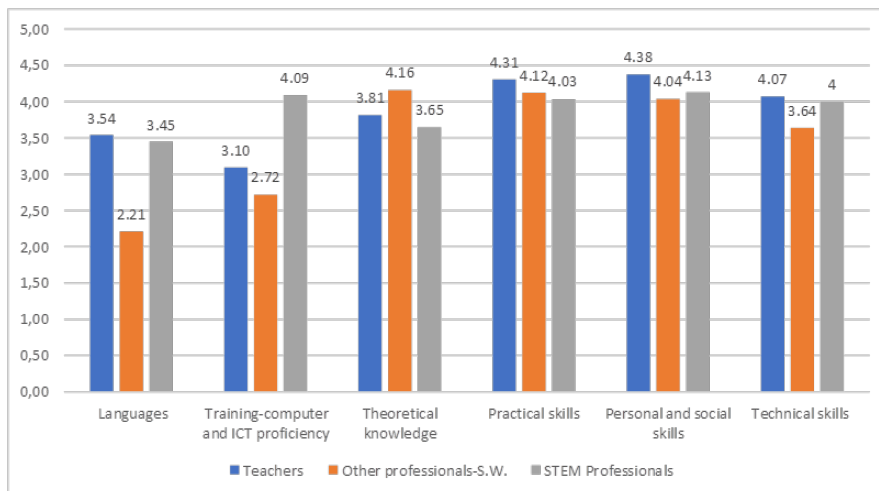
The percentage distribution of the variable *Computer courses* in each of the occupational groups is presented in each cell, together with the corrected standardised residuals. For corrected standardised residuals: \*\* p<0.05

## Recruitment factors

Figure I shows the opinion of teachers, STEM professionals and other social welfare professionals regarding the value of different competences as relevant recruitment factors for current employment. A first reading of the graph shows that the two competences that are the subject of this research were the least valued by the three groups, with the exception of theoretical knowledge and technical competences in the case of STEM professionals. Specifically, in the teachers' group, computer or ICT training or proficiency was the lowest rated competence, with a mean of 3.10 out of a maximum of 5. Language skills were rated, as a recruitment factor, with a mean of 3.54. At the other end of the scale, personal skills, which encompass aspects included in the survey itself, such as personality, social skills, communication, and ability to work in a group, were the most highly rated recruitment factor (mean 4.38). Academic training, which encompasses theoretical knowledge and

practical skills, also received high ratings, with averages of 3.81 and 4.31 points, respectively.

**FIGURE I.** Recruitment factors. Opinions of teachers, STEM professionals, and other S.W. professionals (average values).



The results of the comparison of the usefulness of these competences as recruitment factors for current employment are shown in Table VII. The ANOVA test showed statistically significant differences between the three occupational groups in all the skills described ( $p < 0.000$  in all cases). The effect size, measured by partial  $\eta^2$ , was high (Cohen, 1988) for the variables *Language skills* (0.183) and *Computer and ICT skills* (0.209) and moderate-small for the other variables. Since the hypothesis of equality of means was rejected, post hoc tests were carried out to analyse separately the differences between teachers and each of the other two groups. Specifically, the Bonferroni correction was applied, which revealed statistically significant differences and a high effect size ( $p < 0.000$ ; and  $d$  of 0.911) in the importance of language skills with other professionals in the social welfare system. Compared to a score of 3.54 in the case of teachers, this competence was rated by these professionals with a mean value of 2.21. The differences with STEM professionals were not significant.



There were significant differences between the two groups in the importance assigned to computer or ICT training or proficiency. The direction of these differences was different for each pair of comparisons. The labour market, in the respondents' own opinion, values this competence more highly for teachers than for other welfare professionals (means of 3.10 vs. 2.72) with a  $d=3.04$  value. For STEM professionals, the score was significantly higher (4.09), as was the effect size value (0.82). In relation to the analysis of the rest of the competences, the data in the table indicated that teachers were the group that rated the competences most highly in terms of their usefulness as recruitment factors. The differences were significant in all cases, with the exception of technical skills, when compared to STEM professionals. Only in the case of theoretical knowledge, and when compared with other professionals in the social welfare system, were teachers' ratings of their usefulness in finding a job lower.

TABLE VII. Recruitment factors. Comparative ANOVA between occupational groups.

	Teachers	Other professions S.W.	STEM professionals
Language skills	3.54(1.42)	2.21(1.27)*** $d=0.911$	3.45(1.38) $d=0.064$
	F=833.598, $p<0.000$ ; partial $\eta^2=0.183$		
Computer and ICT training	3.10(1.22)	2.72(1.24)*** $d=0.304$	4.09(1.01)*** $d=0.82$
	F=987.841, $p<0.000$ ; partial $\eta^2=0.209$		
Theoretical knowledge	3.81(1.19)	4.16(1.08)*** $d=0.309$	3.65(1.12)*** $d=0.139$
	F=156.615, $p<0.000$ ; partial $\eta^2=0.040$		
Practical Skills	4.31(1.05)	4.12(1.21)*** $d=0.164$	4.03(1.09)*** $d=0.258$
	F=30.201, $p<0.000$ ; partial $\eta^2=0.008$		
Personal Comp.	4.38(0.97)	4.04(1.28)*** $d=0.285$	4.10(0.97)*** $d=0.235$
	F=51.036, $p<0.000$ ; partial $\eta^2=0.013$		
Technical Comp.	4.07(1.09)	3.64(1.32)*** $d=0.34$	4(1.06) $d=0.065$
	F=103.168, $p<0.000$ ; partial $\eta^2=0.027$		

Mean (standard deviation). Significance values in Bonferroni correction: \*\*\*  $p<0.000$ . Test of effect ( $d$ ) is included for each pair of comparisons (teachers and other group).

## Discussion and conclusions

This research analyses two of the characteristic competences of today's information society, languages and ICT skills, from the point of view of their acquisition and their relevance in the labour market by early childhood and primary education teachers. We have worked with data from an extensive nationwide survey carried out by the National Institute of Statistics on university graduates (including 1st and 2nd cycle graduates) who graduated from Spanish universities (INE, 2020).

In the first objective, we set out to describe the degree of acquisition of the competences of *language knowledge* and *ICT skills* that early childhood and primary school teachers claim to possess, as well as the in-service training developed in these areas. The teachers express a medium-high level of knowledge of English as a language other than their mother tongue. The comparative analysis reveals that the level is higher than that expressed by the rest of the professionals in the social welfare system, but lower than that expressed by STEM professionals. However, it is the group of teachers that expresses a higher incidence of lifelong learning in this area. A joint reading of both results leads us to the fact that there may be a deficit in formal training in this area which is compensated by the professionals themselves through the implementation of complementary training activities. The data provided by the latest TALIS 2018 report (Ministry of Education and Vocational Training, 2019) support this idea, showing that only 39% of primary school teachers state that they have received training to teach in multilingual environments. Along the same lines, Fernández-Viciano and Fernández-Costales (2017) noted that students of the bachelor's programme' in Primary Education express low linguistic self-efficacy. The percentage of teachers who express an advanced level of ICT proficiency is low, although it is also higher than that reported by professionals in the social welfare system. As in the previous case, educational professionals continue to carry out, to a greater extent, continuous training activities. STEM professionals outperform teachers in this competence both in terms of the level expressed and the development of training activities.

We consider this interest in lifelong learning to be one of the strengths to be highlighted because of this study. The differences in average values not only outweigh the occupational groups described in our research (with the exception of computer training for STEM

professionals) but are also visible when compared with other results from the international context. Thus, taking data from Eurostat, the recent report by Fundación CyD revealed that only 21.2% of technicians and scientific and intellectual professionals in the EU undertake lifelong learning (Fundación Conocimiento y Desarrollo, 2020). This percentage is lower, especially in the case of languages, than that obtained in the present study, in which 57.5% of teachers said they undertook this type of training. It is necessary to consider that in-service teacher training can be considered an activity intrinsic to professional development, especially since the promulgation of Royal Decree 2112/1984, of 14 November, which regulates the creation and operation of Teacher Training Centres, and its subsequent updating with Royal Decree 294/1992. The mission of these entities is to promote training activities among teachers based on the needs detected among the teaching staff. On the other hand, in 2011, several agreements were established between the Ministry of Education, Science and Sport and the Autonomous Communities in relation to in-service teacher training to establish additional payments linked to the performance of training activities, also known as training six-year term, consisting of the accreditation of at least one hundred hours of training every six years of teaching service.

In response to the second objective, the relevance of these competences for teachers' access to the labour market is analysed. It is striking that the two competences selected were considered by this group to be the least relevant recruitment factors in obtaining their current job. Practical skills, technical skills such as management or planning skills, or other skills of a personal and/or social nature, such as personality, social skills, communication, or the ability to work in a group, are considered by the respondents themselves to be more relevant recruitment factors. To understand the discrepancy between the labour demands of the new social model reflected in institutional documents (European Commission, 2017; European Commission, 2020) and the results obtained in this study, it is necessary to consider the fact that 71% of all teachers in Spain worked in public schools in the 2017/2018 academic year (Ministry of Education and Vocational Training, 2020). Teaching is therefore mainly carried out in the public sector, with the selective examinations for access to the civil service being rigid competitive examination processes in which the competences analysed take second place and are seen as an added value and not as a requirement for professional practice.

We conclude by pointing out that, although teachers express a lack of proficiency in language and computer skills when the level expressed by STEM professionals is used as a comparative indicator, the results have highlighted the importance of lifelong learning in these areas. Although it is still necessary to develop a regulatory framework that favours and promotes these, types of training activities (Álvarez-Rementería et al., 2017), Spain is among the countries that give most importance to these skills in the design of its lifelong learning policies (González-Moreira et al., 2021). On the other hand, the labour market in the field of education reflects institutional demands by valuing, in its recruitment processes, these competences to a greater extent than the other occupational sectors described (especially those of a more related nature). Nevertheless, greater importance continues to be given to the mastery of other more “traditional” competences such as theoretical and practical knowledge.

As for the recommendations arising from this research, we consider that the results obtained are a wake-up call for the university system responsible for teacher training. On the one hand, both the contents and the teaching strategies implemented in the curricula, which aim to train future teachers in these subjects, should be reviewed. But, on the other hand, teacher training in these areas must go beyond mere technical training. This is a necessary but not a sufficient condition. In the case of ICT competence, initial training in pedagogical content is necessary to ensure that the use of technological applications and tools really enriches the teaching-learning process with their future students (Tárraga-Mínguez et al., 2017). What is important is not so much the *what*, but the *why*, and, above all, the *what for*; that is, their usefulness for daily practice (Escudero et al., 2018; Flórez et al., 2016; Leite et al., 2016). Thus, for example, the analysis conducted by Gorjón et al. (2020), using PISA 2018 data, showed that, compared to the benefits of moderate or high use of technology on mathematical performance, high use of technology leads to penalties. The situation is similar in the case of language proficiency. As indicated in the Study on Language Proficiency coordinated by the National Institute for Educational Assessment (Ministry of Education, Culture and Sport, 2012), future improvement in pupils does not depend on a simple increase in academic tasks but requires the contribution of other factors. It is pointed out, in this respect, that a comprehensive teaching and assessment model should be adopted which equally affects all dimensions of language proficiency (writing, speaking, understanding,

reading, pronunciation, etc.). In both cases the implication for the teacher education system is clear: competence in these domains would not be complete if it is not accompanied by the necessary pedagogical skills to facilitate truly meaningful learning for their learners in these domains.

The present study has several limitations. First, we must consider the low effect size found in most analyses. However, as Fidler (2005) points out, when working with large sample sizes, as is the case here, it can be common to find small but statistically significant effects. Secondly, we point out other limitations that derive from the use of this type of survey. On the one hand, the subjectivity of the responses means that the conclusions must be interpreted with caution as they are based on the opinions of the respondents. On the other hand, the fact that, not being a survey specifically designed for the objectives of this research, it has not been possible to consider some variables that could be relevant in the interpretation of the results, such as the level of education at which they teach or the nature, public or private, of the work centres. These variables should be considered in future lines of research. We also propose the need to develop future studies to analyse the impact of the contents and methodological strategies implemented in the curricula of the syllabuses of the bachelor's degree in Early Childhood Education and bachelor's programme in Primary Education at Spanish universities towards the acquisition of digital and language skills.

## Bibliographic references

- Alfageme-González, M. B., & Miguel, N. J. (2017). Los docentes de la enseñanza obligatoria en España y las actividades de formación continua. *Perfiles Educativos*, XXXIX(158), 148–165.
- Álvarez-Rementería, M., Arandia, M., & Martínez, B. (2017). La configuración política de la formación continua del profesorado no universitario: Desde el discurso europeo hasta la gestión del País Vasco. In G. K. Academics (Ed.), *Caleidoscopio educativo. Prácticas y reflexiones iberoamericanas* (pp. 79–93). Global Knowledge Academics.

- Babatunde, O., & Soykan, E. (2020). Covid-19 pandemic and online learning: the challenges and opportunities. *Interactive Learning Environments*, 1–13. <https://doi.org/10.1080/10494820.2020.1813180>
- Bisquerra, R. & Pérez-Escoda, N. (2015). ¿Pueden las escalas Likert aumentar en sensibilidad? *REIRE, Revista d'Innovació i Recerca en Educació*, 8 (2), 129-147. <http://dx.doi.org/10.1344/reire2015.8.2.82>
- Castells, M. (2006). *La era de la información: economía, sociedad y cultura*. Alianza.
- Cifuentes-Faura, J. (2020). Docencia online y Covid-19 : la necesidad de reinventarse. *Revista de Estilos de Aprendizaje*, 13, 115–127.
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences*. Lawrence Erlbaum Associates
- Coleman, J.A. (2006). English-medium teaching in European Higher Education. *Language Teaching. Open Research Online*, 31(1),1-14. <http://dx.doi.org/10.1017/S026144480600320X>
- Council of the European Union. (2002). *Council Resolution of 27 June 2002 on lifelong learning*. Official Journal of the European Communities. C 163/1. 9.7.2002
- Council of the European Union. (2014). *Council conclusions of 20 May 2014 on multilingualism and the development of language competences*. Official Journal of the European Union. C 183/26. 14.6.2014
- Council of the European Union. (2018). *Recommendation of 22 May 2018 on key competences for lifelong learning (Text with EEA relevance)*. Official Journal of the European Union. C 189/1. 4.6.2018
- Council of Europe. (2001). *Common European Framework of Reference for Languages: Learning, Teaching, Assessment*. Estrasburgo. <https://www.coe.int/en/web/common-european-framework-reference-languages>
- Escudero, J. M., Martínez-Domínguez, B., & Nieto, J. M. (2018). Las TIC en la formación continua del profesorado en el contexto español. *Revista de Educación*, (382), 57–80. <https://doi.org/10.4438/1988-592X-RE-2018-382-392>
- European Commission. (2017). *Communication from the commission to the european parliament, the council, the european economic and social committee and the committee of the regions. Strengthening European Identity through Education and Culture*. Strasbourg, 14.11.2017. COM(2017) 673 final

- European Commission. (2020). The Digital Competence Framework 2.0. <https://ec.europa.eu/jrc/en/digcomp/digital-competence-framework>
- Eurydice. (2005). *La profesión docente en Europa: Perfil, tendencias y problemática. Informe anexo: Reformas de la profesión docente: análisis histórico (1975-2002). Educación Secundaria Inferior General*. Secretaría General Técnica-CIDE
- Eurydice. (2015). *La Profesión Docente en Europa : Prácticas, Percepciones y Políticas*. Luxemburgo. <https://doi.org/10.2797/06034>
- Fantova, F. (2019). Los nuevos servicios sociales y las profesiones de la intervención social. *RES. Revista de Educación Social*, 29, 11–27. <https://eduso.net/res/revista/29/el-tema/los-nuevos-servicios-sociales-y-las-profesiones-de-la-intervencion-social>
- Fernández-Viciana, A., & Fernández-Costales, A. (2017). El pensamiento de los futuros maestros de inglés en Educación Primaria: Creencias sobre su autoeficacia docente. *Bellaterra Journal of Teaching and Learning Language and Literature*, 10(1), 42–60. <https://doi.org/10.5565/rev/jtl3.684>
- Fidler, F., Cumming, G., Thomason, N., Pannuzzo, D., Smith, J., Fyffe, P., Edmonds, H., Harrington, C., & Schmitt, R. (2005). Toward improved statistical reporting in the journal of consulting and clinical psychology. *J Consult Clin Psychol*, 73(1):136–43. <https://doi.org/10.1037/0022-006X.73.1.136>
- Flórez, L. D., Ramírez, C., & Ramírez, S. (2016). Las TIC como herramientas de inclusión social. *3C TIC*, 5(1), 54–67. <https://doi.org/10.17993/3ctic.2016.51.54-67>
- Fundación Conocimiento y Desarrollo. (2020). *Informe CYD 2019. Capítulo 2 Graduados universitarios y mercado de trabajo*. <https://www.fundacioncyd.org/publicaciones-cyd/informe-cyd-2019/>
- González-Moreira, A., Ferreira, C., & Vidal, J. (2021). Comparative Analysis of the Transition from Early Childhood Education to Primary Education: Factors Affecting Continuity between Stages. *European Journal of Educational Research*, 10(1), 441–454. <https://doi.org/10.12973/eu-er.10.1.441>
- Gorjón, L., Osés, A., & de la Rica, S. (2020). *Tecnología en la educación ¿Cómo afecta al rendimiento del alumnado?* ISEAK
- Guarro, A., Martínez, B., & Pruaño, A. P. (2017). Políticas de formación continuada del profesorado: Análisis crítico del discurso oficial de comunidades autónomas. *Profesorado Revista de Currículum y*

- Formación Del Profesorado*, 21(3), 21–40. <https://doi.org/10.30827/profesorado.v21i3.9967>
- Halbach, A., Lázaro, A., & Pérez, J. (2013). La lengua Inglesa en la nueva universidad Española del EEES. *Revista de Educacion*, (362), 105–132. <https://doi.org/10.4438/1988-592X-RE-2011-362-154>
- Herrera, M. (2014). Migración cualificada de profesionales de España al extranjero. *Anuario CIDOB de la Inmigración*, 89-108. <https://www.raco.cat/index.php/AnuarioCIDOBInmigracion/article/view/287323>
- ILO. (2008). *Resolución sobre la actualización de la Clasificación Internacional Uniforme de Ocupaciones*. <https://www.ilo.org/public/spanish/bureau/stat/isco/docs/resol08.pdf>
- INE. (2012). *Introducción a la CNO*. <http://www.ine.es/jaxi/menu.do?type=pcaxis&path=%2Ft40%2Fcno11%2F&file=inebase&L=0>
- INE. (2020). *Encuesta de Inserción Laboral de los Titulados Universitarios EILU-2019. Metodología*. [https://www.ine.es/daco/daco42/eilu/metodologia\\_2019.pdf](https://www.ine.es/daco/daco42/eilu/metodologia_2019.pdf)
- Jover, G., Fleta, T., & González, Y. R. (2016). La formación inicial de los maestros de educación primaria en el contexto de la enseñanza bilingüe en lengua extranjera. *Bordon*, 68(2), 121–135. <https://doi.org/10.13042/Bordon.2016.68208>
- Leite, C., Martínez, R., & Monteiro, A. (2016). TIC y formación inicial de maestros: oportunidades y problemas desde la perspectiva de estudiantes. *Cuadernos de Investigación Educativa*, 7(1), 69. <https://doi.org/10.18861/cied.2016.7.1.2577>
- López-Roldán, P. & Fachelli, S. (2018). *Metodología de la Investigación Social Cuantitativa*. Universitat Autònoma de Barcelona.
- Marina, J. A., Pellicer, C., & Manso, J. (2015). *Libro Blanco de la Profesión Docente y su Entorno Escolar*. [http://educalab.es/documents/10180/38496/LIBRO-BLANCO\\_ProfesionDocente\\_JAM\\_v11.pdf/e4e1d927-6a61-4897-bca0-ada011dca331](http://educalab.es/documents/10180/38496/LIBRO-BLANCO_ProfesionDocente_JAM_v11.pdf/e4e1d927-6a61-4897-bca0-ada011dca331)
- Martín del Peso, M., Rabadán, A. B., & Hernández, J. (2013). Desajustes entre formación y empleo en el ámbito de las enseñanzas técnicas universitarias: La visión de los empleadores de la Comunidad de Madrid. *Revista de Educacion*, (360), 244–267. <https://doi.org/10.4438/1988-592X-RE-2011-360-110>
- Martínez-Losada, C., García-Barros, S., Carlos, J., & López, R. (2017). Percepción de los maestros en formación sobre los objetivos de enseñanza y sus propias capacidades profesionales. *Revista de*



- Investigación y Experiencias Didácticas*, 123–128. <https://ddd.uab.cat/record/184703>
- Ministry of Education and Vocational Training. (2019). *TALIS 2018. Estudio internacional de la enseñanza y del aprendizaje. Informe Español*. Instituto Nacional de Evaluación Educativa. <https://www.educacionyfp.gob.es/inee/evaluaciones-internacionales/talis/talis-2018.html>
- Ministry of Education and Vocational Training. (2020). *Informe 2020 sobre el estado del sistema educativo. Curso 2018-2019*. Secretaría General Técnica. <https://doi.org/10.4438/i20cee>
- Ministry of Education, Culture and Sports. (2012). *Estudio Europeo de Competencia Lingüística EECL*. Instituto Nacional de Evaluación Educativa
- OECD. (2020). *TALIS 2018 results (volume II): Teachers and School Leaders as Valued Professionals*. OECD. <https://doi.org/10.1787/3b9551db-en>
- Perrenoud, P. (2004). *Diez nuevas competencias para enseñar. Invitación al viaje*. Graó. <https://www.grao.com/es/producto/diez-nuevas-competencias-para-ensenar>
- Pesquero, E., Sánchez, M. E., González, M., Martín del Pozo, R., Guardia, S., Cervelló, J., Fernández Lozano, P., Martínez Aznar, M. & Varela, P. (2008). Las competencias profesionales de los maestros de primaria. *Revista Española de Pedagogía*, 66(241), 447–466. <https://revistadepedagogia.org/lxvi/no-241/las-competencias-profesionales-de-los-maestros-de-primaria/101400010050/>
- Rodríguez-Esteban, A., Vidal, J., & Vieira, M. J. (2019). An analysis of the employability of Spanish graduates through the Horizontal Match. *Revista de Educación*, 2019(384), 221–245. <https://doi.org/10.4438/1988-592X-RE-2019-384-411>
- Royal Decree 1393/2007, dated 29<sup>th</sup> October, establishing the organisation of official university studies. BOE 260, 30<sup>th</sup> October 2007, 44037-44048.
- Royal Decree 1591/2010, date 26<sup>th</sup> November, approving the National Classification of Occupations 2011. BOE 306, 17<sup>th</sup> December 2010, 104040 -104060.
- Royal Decree 2112/1984, dated 14<sup>th</sup> November, regulating the creation and functioning of Teachers' Centres. BOE 282, 24<sup>th</sup> November 1984, 33921-33922.

Royal Decree 294/1992, dated 27<sup>th</sup> March, regulating the creation and functioning of Teachers' Centres. BOE 81, 3<sup>rd</sup> April 1992, 11386 – 11388.

Scriven, M. (1994). Duties of the teacher. *Journal of Personnel Evaluation in Education*, 8(2), 151–184. <https://doi.org/10.1007/BF00972261>

Simó, V. L., Lagarón, D. C., & Rodríguez, C. S. (2020). STEM education for and with a digital era: The role of digital tools for the performance of scientific, engineering and mathematic practices. *Revista de Educación a Distancia*, 20(62), 31–34. <https://doi.org/10.6018/RED.410011>

Tárraga-Mínguez, R., Sanz-Cervera, P., Pastor-Cerezuela, G., & Fernández-Andrés, M. . (2017). Análisis de la autoeficacia percibida en el uso de las TIC de futuros maestros y maestras de Educación Infantil y Educación Primaria. *Revista Electrónica Interuniversitaria de Formación Del Profesorado*, 20(3), 107–116. <https://doi.org/10.6018/reifop.20.3.263901>

UNESCO. (1998). *Informe Mundial sobre la Educación. Los docentes y la enseñanza en el mundo en mutación*. Santillana

**Información de contacto:** Agustín Rodríguez- Esteban. Universidad de León, Departamento de Psicología, Sociología y Filosofía. Área MIDE. Campus de Vegazana, s/n, 24071, León, España. E-mail: [arode@unileon.es](mailto:arode@unileon.es)