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GENERIC COMPETENCES FOR END-OF-DEGREE PROJECTS IN TEACHER EDUCATION: STUDENTS' AND UNIVERSITY TEACHERS' PERCEPTIONS

Las competencias genéricas para el Trabajo de Fin de Grado en los títulos de Maestro: percepción de estudiantes y docentes

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Abstract: The aim of this study is to analyse the perception of students and university teachers on the level of importance of generic competences when devising the End-of-Degree Project in Teacher Education, as well as on the amount of training the students receive regarding these competences. It also looks for possible differences between both groups and both ratings. An online survey was applied to a sample of 52 university teachers and 199 fourth year and graduate students of Primary/Preschool Teacher Degree courses. Participants were asked to rate 33 generic competences of an instrumental, interpersonal and systemic nature. It was found that the students thought they had received less training regarding many of the competences, as compared to the perception of university teachers. In addition, importance score was significantly higher than those related to training for both students and university teachers. These results highlight the need to explicitly address and assess the development of generic competences across all subjects in ways that meet the students' needs.

Keywords: Competence; End-of-Degree Project; Teacher Education; perceptions.

RESUMEN: El objetivo de este trabajo reside en analizar la percepción de estudiantes y docentes sobre el nivel de importancia que tienen las competencias genéricas para la elaboración de un Trabajo de Fin de Grado en los títulos de Maestro y el grado de formación que se recibe sobre ellas en estos estudios. Se pretende, además, buscar posibles diferencias entre ambas poblaciones y ambas valoraciones. Se aplicó un cuestionario online a una muestra de 52 docentes y 199 estudiantes de 4.º curso y egresados de esta titulación en la Universidad de Salamanca, pidiendo valorar 33 competencias genéricas de tipo instrumental, interpersonal y sistémico. El alumnado percibió una formación significativamente menor en muchas competencias, en comparación con la perspectiva del profesorado. Para estudiantes y docentes, las puntuaciones en «importancia» fueron significativamente mayores que las referidas a «formación». Nuestros resultados parecen apuntar a la necesidad de incorporar, de manera transversal, el desarrollo de las competencias genéricas y su evaluación en los planes de estudios con una metodología adecuada a las necesidades de los estudiantes.

PALABRAS CLAVE: competencia; Trabajo de Fin de Grado; Grado en Maestro; percepciones.

1. Introduction

1.1. *The concept of competence in the EHEA*

THE INTEGRATION OF SPANISH universities into the European Higher Education Area (EHEA) has brought with it, at least from a legislative point of view, the use of new methodological approaches. One of the aspects associated to them is the need to assess student learning outcomes through competences (Díaz & Pons, 2011; Muñoz *et al*., 2014; Paredes & De la Herrán, 2010; Villa & Poblete, 2007; Zamora & Sánchez, 2015). The notion of competence has also become a central element in a series of reports sponsored by international bodies, like Unesco (1998), Pisa (Adams & Wu, 2003) or DeSeCo (Rychen *et al*., 2003), whose aim is to improve education. Thus, competences have progressively become essential elements for structuring the contents taught within different educational systems and have subsequently become a common instrument for measuring achievement.

Within the European Union, the project «Tuning Educational Structures in Europe» (González & Wagenaar, 2008) emerged with the aim to develop points of reference for devising study programmes that are comparable, compatible, and transparent. These points have been presented as both learning outcomes and as area-specific and generic competences.

One of the initial tasks of the Tuning Project was to carry out a large-scale survey for identifying those wider competences associated with various academic fields. To do this, 30 generic competences, considered most relevant by private companies and higher education institutions participating in the study, were listed. Employers, graduates and academics were asked to rank their importance for performing a given job, their level of training in these competences on completion of a particular programme, and the five competences they considered to be most important.

The Tuning Project has also been instrumental in defining what a competence is and in redefining the role of university teachers as mediators whose task is to help

students acquire relevant skills. González and Wagenaar (2008) present the following conception of what a competence implies:

> Competences are understood as to include knowing and understanding (theoretical knowledge of an academic field, the capacity to know and understand), knowing how to act (practical and operational application of knowledge to certain situations), knowing how to be (values as an integral element of the way of perceiving and living with others and in a social context). Competences represent a combination of attributes (with respect to knowledge and its applications, attitudes, skills and responsibilities) that describe the level or degree to which a person is capable of performing them. (González & Wagenaar, 2008, p. 28)

As mentioned, the Tuning Project considers two types of competences: those specific to a given professional profile and those considered to be generic. The latter, which are those that are common and transferable to any professional profile, are in turn subdivided into instrumental, interpersonal and systemic competences. Villa and Poblete (2007) define these subcategories as follows. Instrumental competences suppose a combination of manual skills and cognitive abilities that make professional competence possible such as skills in manipulating ideas, physical, technological or linguistic skills (in their own language or in a foreign language), and the ability to make decisions or solve problems. Interpersonal competences, which involve personal and relationship skills, refer to the capacity, ability or skill in expressing one's own feelings and emotions in the most appropriate way and accepting the feelings of others. They enable collaboration on common objectives and are linked to the ability to criticise and self-criticise, and the capacity for teamwork or ethical and social commitment. Finally, systemic competences refer to skills and abilities related to a system as a whole and are subsequent to the acquisition of instrumental and interpersonal competences. They require a combination of imagination, sensitivity and ability that allows us to see how the parts relate to and combine as a whole. Included in these competences is the ability to design new systems or to plan changes that introduce improvements in a system in a global way.

1.2. *The End-of-degree Project and generic competences*

The End-of-degree Project (henceforth, EDP) is another novel element of our educational system that has emerged from the incorporation of Spanish universities into the EHEA. The Royal Decree 1393/2007, of 29 October defines the organisation of official university education in accordance with this European perspective. This regulation establishes that it is necessary for students of both Master (art. 15.3) and Bachelor (art. 12.3) degree programmes to produce a final project with a teaching load of between 6 and 30 European Credit Transfer System (ECTS) credits. The purpose of the EDP is to reflect both the area-specific and generic (Art. 12.7) competences that are progressively acquired by the student while taking the various subjects making up their degree course study plan.

The implementation of the EDP has led to the publication of research works (Herrero *et al*., 2011; Muñoz *et al*., 2016; Rullán *et al*., 2010; Valderrama *et al*., 2009) that specifically address the assessment of the different competences reflected in EDPs,

and pay particular attention to those of a generic nature. For instance, Rullán *et al.* (2010) carried out an analysis of the transversal competences evaluated in EDPs from 64 degrees offered at the Autonomous University of Barcelona. In this study a list of 33 competences was used, called «GI-IDES: TFG», where the competences included in the Tuning project were slightly adapted so they could be suitably applied to the subject corresponding to the final project.

However, according to the same authors (Rullán *et al.*, 2010), the assessment of the competences acquired by students through their EDP is somewhat problematic because, while there is a consensus among university teachers that certain specific competences are addressed in their subjects, the same is not true for the generic competences. Many university teachers believe these competences are developed while the student is writing their final project and assessed once the EDP has been completed without the need for any type of prior formative assessment. Furthermore, because they are the work of all and no one in particular, [generic competences] are in serious danger of remaining a declaration of intent, without real translation into classroom practice and without affecting learning (Pérez *et al.*, 2013, p. 178).

In fact, since Spain became a part of the EHEA, problems related to the treatment of generic competences in degree courses have emerged (Martín *et al.*, 2018; Pérez *et al.*, 2013). In addition to the factors above mentioned, other explanations for such deficiencies include: the difficulty in dealing in-depth with more than one or two generic competences in a non-project subject; the lack of information in the report corresponding to each degree and academic guides on how to develop and evaluate these competences; the poor coordination between subjects that deal with the same competence; and the lack of attention paid to the consequences derived from poorly developed generic competences (Pérez *et al.*, 2013). Additionally, some studies suggest that competences tend to be perceived by many university teachers as imprecise and difficult to account for from a pedagogical point of view (Villa *et al.*, 2015).

Some researchers concerned about this problematic situation have begun to evaluate the perception of the importance and/or the level of training received on various generic or transversal competences in new degree courses. However, most of the studies carried out have not associated these perceptions with the training received for developing a final project but to the actual preparedness to carry out the profession (e.g. Romero *et al.*, 2018), and have dealt with a limited number of competences –e.g. research (Rubio *et al.*, 2018), or interpersonal communication (Domingo *et al.*, 2013)–. Furthermore, these authors have generally been interested in the students' perspective without comparing these perceptions to those of the university teachers (exceptions include Gutiérrez-García *et al.*, 2011), and have focused on degree courses other than Education or Teaching such as Engineering (Martínez *et al.*, 2018), Economics (Expósito et al., 2018) or Health Sciences (Montesdeoca-Ramírez *et al.*, 2020).

Therefore, in the field of Teacher Training there are very few studies concerning this research area, that is, the development of the generic competences required by students to devise and write their EDP, which are evaluated as the end result rather than as instrumental to achieving the final product. Nevertheless, mention should be made of two studies. Rubio *et al.* (2018) assessed the perceptions of 109 students, who had completed their EDPs for a bachelor's degree in Education, concerning their mastery of research skills, through their answers to the question, «Is the degree of skill you have acquired for these competences sufficient for carrying out your

EDP?». Similarly, Colás *et al*. (2016) put forth the question «What do you need to know in order to produce an EDP?» to a sample of 125 final-year students from the University of Seville School of Education. In both cases, the participants expressed the need for more training over the course of their studies in skills enabling them to adequately carry out their final projects.

In short, in contrast to what is happening with specific competences, it can be observed that training in generic competences in bachelor's degrees is being neglected, in breach of the educational regulations in this respect derived from the EHEA. However, there is a lack of empirical data on how this is affecting the completion of the EDP, which must be a general reflection of the development of both general and specific competences throughout the course of studies. Moreover, it is necessary to identify which generic competences in particular are being most neglected, either because they are given less importance and/or addressed to a lesser extent in the classroom, with the aim of improving their promotion in the different subjects of the degrees.

For these reasons, in light of the undeniable relevance of generic competences for undertaking a university education, the general objective of this article is to explore the level of importance of generic competences for developing an EDP for a bachelor's degree in Teaching. Also, this work aims to determine the extent to which these competences are fostered throughout the various subjects according to the perspectives of both students and university teachers. More specifically, we intend to:

- Analyse the importance that students and university teachers attribute to various generic competences, as well as their perception of the training received (or given) in relation to them, while looking for significant differences according to gender. We also aim to verify the existence of significant differences between teachers and students in both assessments: importance and training.
- Compare the assessment of importance and that of training within the group of students, on one hand, and within the group of university teachers, on the other; and to identify the generic competences that give rise to the most marked significant differences (those that are very important, but for which little training is received or provided).

2. Methodology

2.1. *Procedure*

A cross sectional, descriptive and inferential design was used for this study and a convenience sampling procedure was implemented to select participants.

During May and June of 2019, 2020, and 2021 distribution lists were used to send an email to students in the fourth year of either a bachelor's degree in Teacher in Preschool Education or Teacher in Primary Education at the University of Salamanca. The email was also sent to all students of these new teaching degrees who had graduated in 2016, 2017 or 2018, inviting them to participate. The recruitment of the fourth-year students was carried out near the end of the academic year so they would have at least some experience with developing their EDP and, consequently, be able to give a

more in-depth opinion with regard to the importance of the competences necessary for carrying out an EDP and the training they had received in relation to this.

Additionally, in June 2019, 2020 and 2021, the University of Salamanca directory was used to send an e-mail requesting the participation of university teachers who had taught a subject or subjects in one of the previously mentioned degrees.

In both cases, the invitation indicated the purpose of the study, and the fact that participation was solely voluntary and anonymous. It was accompanied by a link to an online survey that could be answered in about 10-15 minutes.

2.2. *Participants*

The student sample consisted of 199 fourth-year students (70.3 %) or graduates (29.7 %) of a bachelor's degree in Teacher in Preschool Education (50.3 %) or Primary Education (49.7 %). They belonged to one of the three teacher training colleges of the University of Salamanca: the Teacher Training College of Zamora, the Faculty of Education in Salamanca and the College of Education and Tourism of Avila. The sample was comprised of 159 females (80 %) and 40 males (20 %) between the ages of 21 and 57 years, with the average age being 25.2 years (SD = 5.24).

The sample of university teachers included 52 respondents (44.2 % females, 55.8 % males) aged 31 to 65 years (M = 46, SD = 10.23). All of them taught subjects in the degree courses for Preschool and/or Primary Education in the aforementioned colleges/school.

2.3. *Instrument*

Two versions of the survey were created: one for the students and one for the university teachers. In both cases it listed the 33 generic competences («Gi-Des: Tfg") that could be assessed in an EDP (Rullán *et al*., 2010) similar to those proposed by the Tuning Project (Gonzalez & Wagenaar, 2008). Accordingly, these competences were grouped into three types: instrumental (11 items), interpersonal (9 items) and systemic (13 items).

In relation to each competence, the students were asked to assess:

- «The importance of the competence for preparing your EDP (to what extent was it necessary?)»,
- «The training received for the competence during your degree studies (to what extent has the degree course contributed to developing that competence?)».
- Similarly, for each competence, the university teachers were asked to evaluate:
- «The importance said competence has in carrying out an EDP (to what extent does a student need to have this competence for developing a good EDP?)»,
- «The training you provide to your students in relation to this competence (to what extent does your teaching activity contribute to its development?)».

The assessments were made using a five-point Likert scale. Therefore, the variables under study were: a) degree of importance attributed to each competence (from

1 = not important to 5 = very important) and b) degree of training received/given in relation to each competence (from 1 = no training to 5 = a lot of training).

For the sample of students, reliabilities were strong/excellent for the three types of competences or subscales (importance: from $\alpha = .87$ to $\alpha = .90$; training: from $\alpha = .89$ to $\alpha = .95$), and excellent for the 33-item scale (importance: $\alpha = .93$; training: $\alpha = .96$). Similarly, for the sample of university teachers, the internal consistency was good for the three subscales (importance: $\alpha = .80$ to $\alpha = .88$; training: $\alpha = .83$ to $\alpha = .90$) and excellent for the total scale (importance: $\alpha = .93$; training: $\alpha = .95$).

2.4. *Data analysis*

Descriptives (mean and standard deviation) of scores were calculated in relation to the 33 competences listed in «Gi-Des: Tfg» (Rullán *et al*., 2010). T-tests for independent samples were carried out to look for significant relationships between the assessments of participants and their gender. To analyse the existence of significant differences between the students' and the university teachers' assessments, t-tests for independent samples were carried out. To identify possible significant differences between the assessments of importance and training made by each group of participants (students and university teachers), t-tests for paired samples were conducted. The analyses were performed using the SPSS 23 statistical package, considering a significance level of .01.

3. Results

3.1. *Importance: Students vs. University teachers*

The competences that, on average, received the highest scores from students in terms of their importance, in order of highest to lowest, were: ability to work autonomously, will to succeed, capacity for applying knowledge in practice, interest in updating knowledge, concern for quality, research skills, capacity to learn autonomously, capacity for generating new ideas, and capacity to adapt to new situations. All of these are classified as systemic competences.

The competences with the highest scores given by the university teachers, in order, were: oral and written communication in your native language, critical reasoning, capacity for analysis and synthesis, ability to work autonomously, capacity for applying knowledge in practice, concern for quality, capacity to learn autonomously, and capacity for organization and planning. Half of these are in the subcategory of instrumental competences (including the first three) and the other half in the systemic subcategory.

In the student sample, significant gender differences were only found in regard to the importance of leadership [$t(197) = -2.68$, $p < .01$]: females ($M = 3.90$, $SD = 1.01$) assessed this competence as being more important than males did ($M = 3.40$, $SD = 1.19$). As for the university teachers, significant differences based on gender were observed in the assessment of the importance of elementary computing skills [$t(50) = 3.88$, $p <$

.001]: the males (M = 4.41, SD = .57) considered this competence to be more important than the females (M = 3.78, SD = .60).

Finally, significant differences were detected in the importance scores given by students and university teachers for nine competences out of the 33 listed. In the case of five interpersonal and systemic competences, students' scores were higher, especially with regard to the relevance of capacity to adapt to new situations and will to succeed. In contrast, university teachers' scores were higher in the case of four instrumental competences. These differences were more pronounced in relation to the importance of basic general knowledge, capacity for critical reasoning and capacity for analysis and synthesis (Table 1).

3.2. *Training: Students vs. University teachers*

The skills that received the highest scores from students in terms of training, in order of highest to lowest, were: capacity for applying knowledge in practice, appreciation of diversity and multiculturality, interest in updating knowledge, teamwork, basic general knowledge, grounding in basic knowledge of the profession, and oral and written communication in your native language. By contrast, the university teachers gave higher scores to critical thinking, concern for quality, capacity for applying knowledge in practice, ethical commitment, capacity for analysis and synthesis, problem solving and grounding in basic knowledge of the profession. No significant differences were found in training assessments according to gender.

Significant differences were found in the training scores given by students and university teachers for 18 of the 33 competences, of which eight were instrumental, nine systemic, and one interpersonal. In all cases the university teachers' scores were significantly higher. This indicated that the university teachers believed the students had received more training than was actually perceived by the students. The differences found in relation to the following competences stand out owing to their magnitude: concern for quality, capacity for analysis and synthesis, critical reasoning, problem solving and research skills (Table 1).

TABLE 1. *Importance of diverse generic competences, according to students and university teachers. Descriptives and T-test for independent samples*

	IMPORTANCE			TRAINING		
	Students	Teachers		Students	Teachers	
	M (SD)	M (SD)	T	M (SD)	M (SD)	T
Instrumental						
1. Basic general knowledge	4.08 (0.90)	4.54 (0.50)	-4.90 ***	3.50 (0.95)	3.94 (0.78)	-3.50 ***
2. Grounding in basic knowledge of the profession	4.12 (0.94)	4.33 (0.86)	-1.44	3.52 (1.04)	4.02 (0.90)	-3.47 ***
3. Capacity for analysis and synthesis	4.30 (0.88)	4.69 (0.54)	-4.04 ***	3.16 (1.05)	4.04 (0.71)	-7.10 ***

4. Critical thinking skills	4.30 (0.83)	4.73 (0.53)	-4.57 ***	3.20 (1.07)	4.29 (0.87)	-6.81 ***
5. Capacity for organisation and planning	4.47 (0.75)	4.60 (0.53)	-1.12	3.24 (1.08)	3.94 (0.80)	-5.23 ***
6. Problem solving	4.12 (0.85)	4.42 (0.67)	-2.42	3.01 (1.06)	4.02 (0.90)	-6.33 ***
7. Decision-making	4.22 (0.82)	4.25 (0.71)	-0.23	3.14 (1.13)	3.73 (0.97)	-3.45 ***
8. Elementary computing skills	4.32 (0.88)	4.13 (0.66)	1.69	3.28 (1.18)	3.15 (1.20)	0.66
9. Information management skills	4.36 (0.85)	4.48 (0.70)	-0.93	3.10 (1.12)	3.46 (1.02)	-2.13
10. Oral and written communication in your native language	4.41 (0.85)	4.75 (0.56)	-3.46 ***	3.47 (1.17)	4.02 (1.04)	-3.30 ***
11. Knowledge of a second language	3.58 (1.39)	3.90 (0.89)	-2.03	2.88 (1.31)	2.73 (1.32)	0.730
Interpersonal						
12. Critical and self-critical abilities	4.23 (0.87)	4.13 (0.79)	0.72	3.15 (1.18)	3.46 (1.09)	-1.71
13. Teamwork	3.40 (1.44)	3.37 (1.17)	0.17	3.54 (1.16)	3.42 (1.19)	0.63
14. Management skills	3.80 (1.07)	3.33 (1.08)	2.83 **	3.01 (1.14)	2.87 (1.10)	0.79
15. Ability to work in an interdisciplinary team	3.49 (1.32)	3.42 (1.13)	0.35	2.89 (1.17)	3.00 (1.17)	-0.61
16. Interpersonal skills	3.95 (1.04)	3.63 (0.95)	2.02	3.09 (1.11)	3.23 (1.10)	-0.81
17. Ability to communicate with experts in other fields	3.80 (1.11)	3.73 (0.91)	0.41	2.74 (1.15)	3.02 (1.11)	-1.55
18. Appreciation of diversity and multiculturality	4.09 (0.99)	3.67 (1.12)	2.61 **	3.60 (1.10)	3.46 (1.20)	0.78
19. Ability to work in an international context	3.52 (1.28)	3.50 (1.13)	0.12	2.66 (1.31)	2.87 (1.43)	-0.97
20. Ethical commitment	4.18 (0.85)	4.35 (0.84)	-1.26	3.36 (1.15)	4.06 (1.00)	-3.99 ***
Systemic						
21. Capacity for applying knowledge in practice	4.66 (0.66)	4.63 (0.77)	0.27	3.63 (0.91)	4.17 (0.86)	-3.90 ***
22. Research skills	4.65 (0.63)	4.54 (0.61)	1.13	3.06 (0.88)	3.85 (0.98)	-5.62 ***
23. Capacity to learn autonomously	4.65 (0.64)	4.62 (0.57)	0.39	3.24 (0.98)	3.88 (0.92)	-4.30 ***

24. Interest in keeping knowledge up to date	4.66 (0.64)	442 (0.70)	2.32	3.59 (0.98)	3.90 (0.87)	-2.13
25. Capacity to adapt to new situations	4.59 (0.64)	4.02 (0.85)	5.37 ***	3.15 (0.95)	3.56 (0.92)	-2.82 **
26. Capacity for generating new ideas (creativity)	4.59 (0.67)	4.52 (0.67)	0.70	3.15 (0.97)	3.81 (0.99)	-4.32 ***
27. Leadership	3.81 (0.91)	3.37 (1.03)	2.87 **	2.82 (0.92)	2.96 (1.07)	-0.93
28. Understanding of cultures and customs of other countries	3.65 (1.18)	3.44 (1.16)	1.20	2.73 (1.01)	3.02 (1.24)	-1.53
29. Ability to work autonomously	4.71 (0.59)	469 (0.61)	0.18	3.26 (0.94)	3.94 (0.98)	-4.60 ***
30. Project design and management	4.16 (0.71)	4.17 (0.81)	-0.11	2.99 (0.98)	3.54 (1.06)	-3.35 ***
31. Initiative and entrepreneurial spirit	4.12 (0.66)	3.90 (1.02)	1.46	2.95 (0.96)	3.33 (1.12)	-2.20
32. Concern for quality	4.62 (0.72)	4.63 (0.56)	-0.11	3.17 (0.96)	4.27 (0.82)	-7.53 ***
33. Will to succeed	4.70 (0.64)	4.15 (1.00)	3.77***	3.05 (1.05)	3.73 (0.97)	-4.23 ***

** p < .01 *** p < .001.

3.3. *Importance versus Training*

In the student sample, significant ($p < .001$) differences were observed between importance and training scores, the former being higher than the latter for all the competences, except for one: teamwork. The magnitude of these differences was greater in the case of systemic competences: research skills ($t_{(198)} = 20.58$), will to succeed ($t_{(198)} = 19.86$), ability to work autonomously ($t_{(198)} = 19.23$), capacity to adapt to new situations ($t_{(198)} = 18.13$), concern for quality ($t_{(198)} = 17.97$), etc.

Among university teachers, importance scores were also significantly ($p < .01$) higher than training scores, except for two competences: teamwork [$t_{(151)} = -4.44$, $p > 0.1$] and appreciation of diversity and multiculturality. The differences observed were greater for some instrumental competences –knowledge of a second language ($t_{(51)} = 7.25$), capacity for organization and planning ($t_{(51)} = 6.39$), capacity for analysis and synthesis ($t_{(51)} = 6.17$), elementary computing skills ($t_{(51)} = 5.99$)–, as well as some systemic competences –ability to work and learn autonomously ($t_{(51)} = 5.84$; $t_{(51)} = 5.79$) and capacity for generating new ideas ($t_{(51)} = 5.61$)–.

4. Discussion and conclusions

Based on our analysis of the importance of generic competences, we have detected how university teachers give priority to skills of a more basic nature, with the three

most valued competences belonging to the instrumental subcategory: oral and written communication in your native language; critical reasoning skills and the capacity for analysis and synthesis. The students, on the other hand, give greater importance to systemic competences, many of which are especially relevant to research work, with the three most valued being: the ability to work autonomously, the will to succeed, and the capacity for applying knowledge in practice. These three competences coincide with those highlighted by a sample of students in their final year of a bachelor's degree in Psychology (Alonso-Martín, 2010), owing to their high level of importance (but with a view to professional training). It seems, therefore, that university teachers tend to give greater value to the generic competences that are useful for both professional practice and for research work, while students are interested in more specific skills necessary for developing their EDP. Maybe teachers assume that the acquisition of systemic competences occurs later than that of instrumental ones (Villa & Poblete, 2007). Conversely, the greater importance given by the students to instrumental and systemic (vs. interpersonal) competences is in line with the taxonomy that Colás *et al.* (2016) identify in the students' answers to the question «What do you need to know in order to face the task of writing an EDP?», i.e., the instrumental component and the intellectual component.

Our study also draws attention to how the students perceive they have received less training than that perceived by the university teachers for 18 out of the 33 competences examined. These results are consistent with the work of Gutiérrez-García *et al.* (2011), which suggests that university teachers tend to believe that they promote competences to a greater extent than that perceived by students. A possible explanation could be found in the fact that university teachers do not address the development of generic competences through a methodology that is appropriate to the training needs of their students. Traditional pedagogical approaches in university teaching in Spain gave great preeminence to curricular content and many lecturers have had difficulty adapting to the new approaches derived from the EHEA, which conceives the teaching-learning process through the promotion of competences. In this sense, specific competences have been more easily addressed in the classroom than generic competences because they are more similar to traditional content.

In this regard, the significant differences observed by Gutiérrez-García *et al.* (2011) with respect to the percentage of students and university teachers who state that practical sessions are common in teaching practice (8 % vs. 86 %, respectively), or that the classes «consist of a pure note-taking exercise» (51 % vs. 6 %), are worth mentioning. It should also be noted that the simple fact of having addressed a series of skills in the classroom does not guarantee that the students have assimilated the competences and can develop them. In addition, these lower levels of training perceived by students might partly explain why the role of the EDP supervisor (i.e., perceived involvement) is a relevant predictor of the results obtained in their projects (Vicario-Molina *et al.*, 2020).

Additionally, in this work, the students consider that the degree of training received in terms of general research skills is intermediate (average score of 3 on a scale of 1 to 5). This result is consistent with a study in which students facing the EDP in a Pedagogy degree course indicated that research skills should be addressed more deeply during their studies in order to prepare them for such work (Rubio *et al.*, 2018). There is also coherence between the low scores given by our students regarding

the training received for fostering the ability to make decisions, analyse and synthesize, and organize and plan, and the high scores on «perceived training needs» in the following skills required for developing an EDP (as evaluated by fourth-year Education students): choosing between different research methodologies, selecting analysis techniques, constructing a poster for the EDP defence, writing a summary about the work, and structuring and writing a report (Colás *et al*., 2016).

In our study, the results obtained for both students and university teachers have shown significant differences in practically all the competences analysed in terms of importance and the training received. The value of importance was always much higher than that of training, especially regarding the systemic competences in the case of the students and in the instrumental ones in the case of university teachers. This distinction is consistent with the assessment made by both groups on the importance of the generic competences and confirms our previous analysis in which it was argued that university teachers prioritize instrumental competences and students' systemic ones.

With regard to limitations, it should be noted that this study is solely based on quantitative data obtained from a sample of limited size of teacher training students, graduates and lecturers. This hinders the representativeness of our data and its transferability to other populations from other degrees (e.g. Biology), in which the relevance of some of the generic competences may be different. Therefore, these findings could be enriched both through a broader quantitative study of a correlational nature using a wider and more heterogeneous sample of university students and teachers of various degrees, as well as through the gathering of qualitative data to gain a more in-depth understanding of the perspectives of these populations.

4.1. *Implications for practice*

Since the implementation of the EHEA, competences have progressively become essential elements for structuring the contents taught within different educational systems and have subsequently become a common instrument for measuring achievement. An example of this can be seen in the European Parliament's recommendation to all Member States to «develop the provision of key competences for all as part of their lifelong learning strategies, and use the 'Key Competences for Lifelong Learning – A European Reference Framework' […] as a reference tool» (European Union, 2006, p. 11).

Consistently with these objectives and principles, the high importance attributed to generic competences by both teachers and students, according to our data, should make university teachers more aware of the need to incorporate, in a transversal manner and with a methodology appropriate to the needs of their students, the development of these competences in the different subjects comprising the degree course. This would subsequently encourage these skills to be reflected in the EDP and, finally, form part of the graduates' professional toolkit. Thus, an improvement in training would translate into better professional performance, for example, by helping search for relevant materials in libraries and online, summarize the readings that are most relevant to current needs, work with others on a report, design, or response to a problem, conduct oral presentations in groups or individually, criticize others' work

constructively and apply others' critiques productively, lead a team or be a useful team member, exchange questions and findings with others through a multiplicity of means, be self-critical of one's own work, etc.

As concluded by Villa *et al*. (2015), the structural changes derived from adaptation to the EHEA seem to have been carried out more effectively than changes in pedagogy, where more formative evaluation strategies aimed at the development of students' competences are lacking. The following comments, included at the end of the questionnaire, stress the need to implement these strategies from the beginning of the bachelor's degree studies:

> I would advise to guide students gradually but systematically from the beginning of their studies towards the elaboration of their EDP so that they develop the necessary competences in the different subjects but also through courses, seminars or workshops. In addition, I would promote tools and guides developed in an interdisciplinary way. (Lecturer 27)

> From the first year, students should be introduced to research work [...] gradually increasing the level of demand. I think that, in this way, students will be better prepared for their EDP. It would also be important that, from the beginning, students are taught how to search for, organise and reference information. (Student 128)

Future research may evaluate the impact that these student-centered methodologies in line with EHEA principles have on students' perceptions of both the amount and quality of the training received on generic competences.

Fortunately, university teachers have at their disposal some useful tools that can help them plan and organize the development and evaluation of generic competences within their subjects, in coordination with other colleagues (e.g. García *et al*., 2010; Marko *et al*., 2019; Pérez *et al*., 2013; Sánchez-Tarazaga *et al*., 2019). Garcia *et al*. (2010), for example, propose an approach based on cards: a) «the competence card» summarizes its definition, any possible training activities and methods for assessment; and b) the «activity card» includes a description, the estimated time the university teacher and student should work, the necessary material, and the assessment that will be carried out.

Moreover, Pérez *et al*. (2013) propose the following steps: configure a list of generic competences to be worked on, develop a map of competences, document each competence (i.e., with rubrics), project the map of competences in the semesters, assign to each subject the competences to be worked on, evaluate the viability of the plan, coordinate the work through commissions (that propose training and evaluation strategies), elaborate guidelines that direct the training of each competence, and write a final report about the results of the assessment.

In our opinion, four features seem key to improving the development and appraisal of the generic competences acquired by teacher training students:

– Teacher training. Many university teachers involved in teaching degree courses within Education seem to demand this and/or to be willing to receive specific training (Villa *et al*., 2015). The training deficits, moreover, seem to feed the resistance of university teachers to get involved in the promotion of generic competences (Pérez *et al*., 2013).

- The coordination of teaching staff. The positive results of some projects show the opportuneness and necessity of programming interdisciplinary actions consisting of the creation of teams of university teachers from different subjects working with cooperative and dynamic methodologies (e.g. Karrera *et al*., 2014; Ordeñana, 2018).
- The use of varied methodologies and training activities (Villa *et al*., 2015). The problem-based learning (PBL) method is suggested, since it has proven to be more effective than others in the development of generic competences in students related to the teaching profession, especially in their final degree courses. This method demands from the student greater autonomy, critical thinking, problem-solving skills, creativity, self-regulation of learning, and integration of knowledge, among other competences (Arias-Gundín *et al*., 2008). An example of how this method can be applied in the context of teacher training is provided by Aragón and Cruz (2016) in the field of environmental education. In their proposal, the organic garden is used as a context to PBL by challenging students to solve a real environmental problem (erosion), thus helping them develop generic competences such as teamwork and problem solving. After inquiring about their own knowledge about the soil, students are required to cooperatively design, implement and evaluate an action plan.
- The testimony and advice of former student teachers, and the provision of models of products through EDP completed and through attendance to public defence sessions or recordings of presentations.

In short, improving the training of generic skills received by students enrolled in a teacher training degree would not only result in the production of higher quality EDPs, but would also allow the graduates to be better equipped in their daily teaching practice.

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