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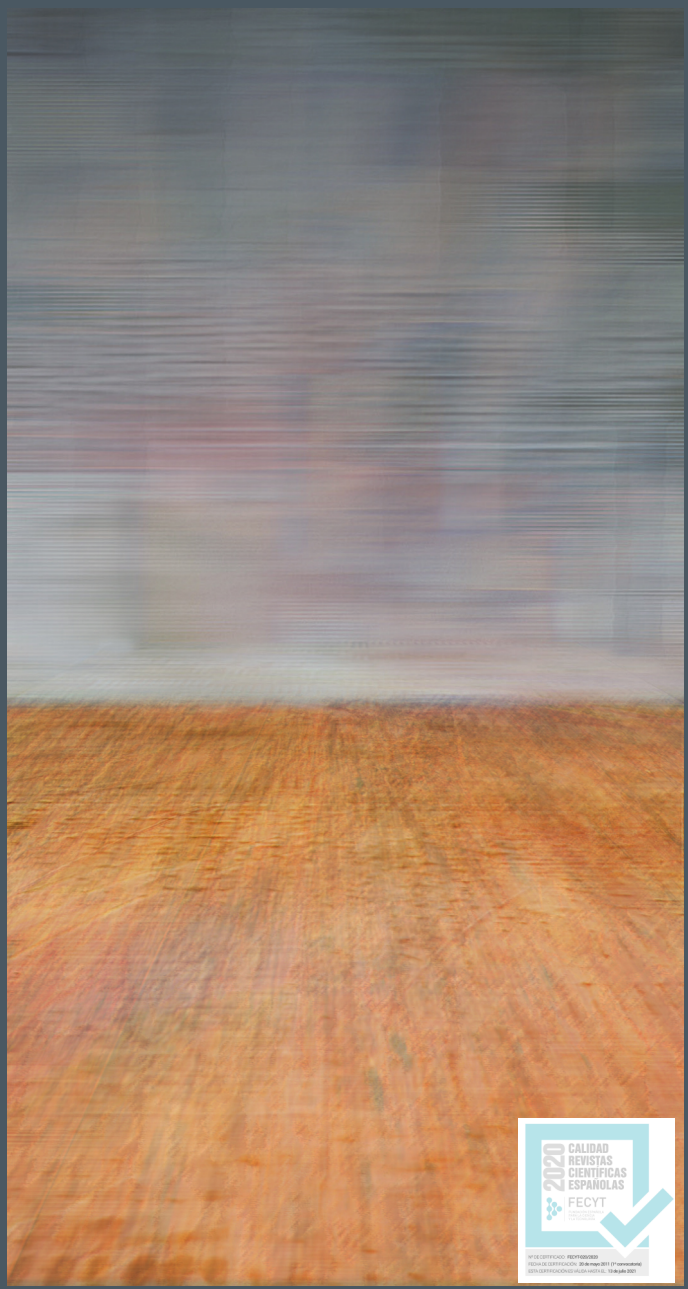

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Presentation

Revista de Educación is a scientific journal published by the Ministerio de Educación, Cultura y Deporte. Founded in 1940, and since 1952 called *Revista de Educación*, it has been a privileged witness of the development of education in the last decades, and an acknowledged means for the dissemination of education research and innovation, both from a national and international perspectives. It is currently assigned to the Instituto Nacional de Evaluación Educativa within the Dirección General de Evaluación y Cooperación Territorial and it is published by the Subdirección General de Documentación y Publicaciones of the Ministerio de Educación, Cultura y Deporte.

Each year we publish four issues. Starting next issue (No. 361), the magazine will have three sections: Research, Essays and Education Experiences, all of them submitted to referees. In the first issue of the year there is also an index of bibliography, and in the second number a report with statistic information about the journal process of this period and the impact factors, as well as a list of our external advisors.

From 2006 to the second number of 2012 (May-August 358), *Revista de Educación* was published in a double format, paper and electronic. The paper edition included all the articles in the especial section, the abstracts of articles pertaining to the rest of sections, and an index of reviewed and received books. The electronic edition contains all articles and reviews of each issue, and it is available through this web page (www.mecd.gob.es/revista-de-educacion/), where it is possible to find more interesting information about the journal. From the 358 number *Revista de Educación* becomes exclusively an online publication.

Revista de Educación assesses, selects and publishes studies framed in well established lines of research, mainly: methodologies of education investigation and assessment; analysis of education systems and public policies; evolution and history of contemporary education systems; education reforms and innovations; quality and equity in education; curriculum; didactics; school organization and management; attention to diversity and inclusive education; educational guidance and tutorship; teacher selection, training and professional development; international cooperation for the development of education.

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***Revista de Educación* does not necessarily agree with opinions and judgements maintained by authors**

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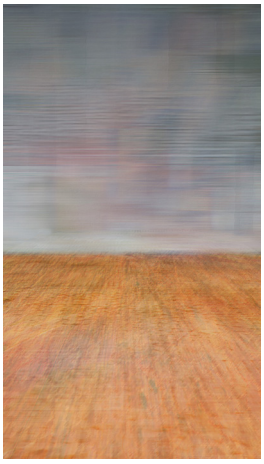

Monographic section

Teachers for the 21st Century: Academic profile, initial training and teaching practices of Spanish teachers. Introduction[1]

Profesores para el siglo XXI: Perfil académico, formación inicial y prácticas docentes de los profesores españoles. Introducción

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Abstract

The paper presents a review of the initial academic characteristics, training and professional activity of Spanish teachers. It is framed within the current debate on teacher quality and its impact on the results of the educational system. Theoretical and conceptually, the study adopts the meta-research approach. Methodologically, a review of the literature on the subject is carried out to allow a well-founded reflection on the differential characteristics of Spanish teachers with respect to other teachers in other educational systems. In order to do that, some of the most relevant and high impact works published in recent years are considered. First, the academic profile of the aspiring teacher is characterized through a review of the literature and some data from the Spanish University System. Next, we present a comparative view of some formative elements and common teaching practices obtained, essentially, through the GTI and TALIS studies of the OECD. These include instructional practices (quality of discourse, quality of the subject matter presented and cognitive involvement of the student)

[1] This work has been funded by the Spanish Ministry of Economy and Business (MINECO) through the project RTI2018-099365-B-I00: Aptitudinal, attitudinal, and prior academic performance profile of teacher education applicants: implications for selection into university entrance (PROTEACHER).

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and the formative profile declared by the teachers. The conclusions point to the fact that the differential profile of aspiring and practicing teachers is not clearly different from that of teachers in other educational systems, except in issues related to initial training in the disciplinary content of teaching and training in digital competence. The article closes with some reflections on possible challenges for the renewal of teacher training in the next decade and with a formal presentation of this monograph.

Key words: Teacher profession, professional induction, professional learning, teaching practices, TALIS, GTI, Spain.

Resumen

El trabajo presenta una revisión de las características académicas iniciales, la formación y la actividad profesional de los profesores españoles. El artículo se enmarca en el debate actual sobre la calidad de los docentes y su impacto en los resultados del sistema educativo. Teórica y conceptualmente el estudio adopta el enfoque propio de la meta-investigación. Desde el punto de vista metodológico, se lleva a cabo una revisión de la literatura sobre el tema que permita una reflexión fundamentada sobre las características diferenciales de los docentes españoles con respecto a otros docentes de otros sistemas educativos. Para ello se consideran algunos de los trabajos más relevantes y de mayor impacto publicados en los últimos años. En primer lugar, se caracteriza el perfil académico del aspirante a maestro, a través de la revisión de la literatura y de algunos datos procedentes del Sistema Universitario Español. A continuación, se presenta la visión comparada de algunos elementos formativos y de prácticas docentes habituales obtenidos, esencialmente, a través de los estudios GTI y TALIS de la OCDE. Estos incluyen a las prácticas instructivas (calidad del discurso, calidad del tema expuesto e implicación cognitiva del alumno) y el perfil formativo declarado por los profesores. Las conclusiones apuntan a que el perfil diferencial del aspirante a maestro y del docente en ejercicio no es netamente diferente al de docentes en otros sistemas educativos, salvo en cuestiones relacionadas con la formación inicial en el contenido disciplinar de la enseñanza y la formación en la competencia digital. El artículo se cierra con algunas reflexiones relativas a posibles retos para la renovación de la formación docente en la próxima década y con una presentación formal de este número monográfico.

Palabras clave: Profesión docente, iniciación profesional, aprendizaje profesional, prácticas docentes, TALIS, GTI, España.

Introduction

There is no article on the teaching profession that does not begin by citing Hattie (2008). In his review of the quantitative literature on the relationship between academic achievement and determinants of academic achievement, he highlights that "teacher factor" makes larger contributions to student learning than factors associated with home, curriculum, the student him/herself, or school. Along the same lines, Hanushek et al. (2002) note that having a high-quality teacher during elementary school can offset or even eliminate the initial disadvantage of a low socioeconomic background. Hanushek has calculated that students who have had teachers for one year whose relative efficacy places them at the 90th percentile or above learn the equivalent material 150% more than students taught by teachers who rank at the 10th percentile or below (Hanushek et al., 2016). The work of Sanders et al. (1997), through value-added models, point out teacher effectiveness once other factors are controlled for. They go so far as to assert that more can be done to improve education by improving teacher effectiveness than by any other single factor. And along the same lines, Attebery et al. (2015) reveal that early years of professional practice can more accurately predict teacher effectiveness than teacher characteristics, especially in the area of mathematics.

In Hattie's logic, which highlights the factors that differentially impact performance, the teacher who "has a committed plan, who is aware of what his students know and think, who receives their feedback, who knows where he is and where he is going and who creates a climate of trust and can work in it", in the words of Fernández-Enguita (2014, pp.53), is the one who contributes to his students' learning above the usual.

Precisely because the teacher is the most determining factor in the development of student learning, there is a constant call for better prepared teachers. Reflections on the need for better teacher training are a constant in the research literature, and it has increasingly become a social concern and demand (to take some distance from the Spanish situation, the evolution of the Australian case can be seen in Gore, Barron, Holmes, & Smith, 2016).

This situation of demand and social criticism is clearly linked to the visibility of the results of international evaluations on the functioning of educational systems. It seems that teachers and professors are the (almost) only ones responsible for the average (others would say weak)

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performance levels of a country like Spain. The indicators that speak of the performance of the educational system show elements that manifest a behaviour with strong points or at least not distant from the environment and other elements that are perhaps more worrying. I will refer to three indicators: PISA results, some performance indicators in the educational system and education spending.

The latest edition of PISA, carried out in 2018, shows that any comparative indicator of the average level of performance of the Spanish educational system - from the reference the average score of the OECD, the distance in terms of magnitude of the effects, the estimated distances in terms of years of schooling or the stability of the Spanish scores throughout the different editions of PISA - show small differences (some significant) and with little practical significance. The location of the Spanish educational system in the PISA ranking is in the center of the classification, in a median position, which does not allow, in view of these data, to evaluate them as extremely negative, nor as extremely positive (Castro, 2020).

In another set of indicators of this international assessment, the minimal percentages of Spanish students who achieve high levels of performance are worrying. In mathematical competence, only 7% of Spanish students achieve level 5 or higher (only 1.1% of these students achieve the maximum level), compared to 11% of OECD students. In the case of science, only 4% are at level 5 or higher (compared to 7% of the OECD average) (MEFP, 2019b).

The State System of Education Indicators (2019c) summarizes in facts and figures the state and evolution of the education system. The "*early dropout from education and training*" is usually alluded to as the main exponent of malfunctioning of the education system. The 2018 data report that the percentage of early dropouts in Spain is 17.9%. This indicator has had a constant rate of decrease since 2008, when it stood at 31.7%. Spain is the country with the highest rate in the European Union, which sets its target for the EU at 10%, while for Spain it is set at 15% by 2020. Certainly, these are not data that should be ignored or underestimated, they are not good. Although the naming of this indicator is obviously unfortunate, the characterization of dropout as "early" does not refer to the moment of dropout but to the absence of a degree. The definition refers to the percentage of the population between 18 and 24 years of age without an upper secondary education degree. And the procedure

for obtaining a diploma at the end of a school year depends more on the architecture of the educational system than on the teaching action or the apparent difficulty of this group of students.

Finally, I will refer to spending on education. The analysis carried out by Professor Julio Carabaña (2020) clearly shows that spending on education does not seem to be a differential problem with respect to other European countries. Spending in Spain is around 89% of the OECD average. If Gross Domestic Product (GDP) is taken as a reference, Spain spends 3.6% on education, eight tenths of a percentage point below the OECD average. However, if total expenditure per pupil is studied in relation to GDP per capita, Spain devotes 26%, which is exactly the same as the average for the OECD and the 28 EU countries. Beyond the consideration of the sufficiency of these values, which evidence an adjustment to the level of income and an average dedication by the educational authorities, it is important to note that the incidence of spending per pupil on performance is significant below a threshold value, which is quantified at USD 50,000 of cumulative expenditure on schooling per pupil (Schleicher, 2019). In Spain, at age 16 it is 83,000 USD, placing it well above that threshold value.

These three sets of indicators reveal an educational system located in the middle range of performance, in the middle range of investment in education and with a structural problem that affects almost 18% of students who do not advance in the development and completion of upper secondary education.

However, can these circumstances be attributed to the actions and/or training of teachers and professors? The pessimistic discourse that pervades education in Spain points directly to the almost sole responsibility of teachers. Perhaps it is time to evaluate the functioning of the educational system, which is not as deficient as it is usually portrayed, as I have briefly tried to outline in the previous paragraphs, although it is among our desires to get out of this average. In this context of improvement, before considering how to optimize the teacher's influence on student learning, it may be pertinent to assess whether Spanish teachers are so different, so unique in their academic profile, initial training, and teaching practices to teachers in other educational systems. The problem facing the Spanish education system is complex and there are no "parsimonious" shortcuts that reduce the problem to teachers and the solutions to increased spending.

Theoretically and conceptually, this work adopts the meta-research approach. From the methodological point of view, a review of the literature on the subject is carried out to allow a well-founded reflection on the differential characteristics of Spanish teachers with respect to other teachers in different educational systems. Some of the most relevant and high-impact works published in recent years are considered. First, the academic profile of the aspiring teacher is characterized through a review of the literature and some data from the Spanish University System. Next, we present a comparative view of some formative elements and common teaching practices obtained, essentially, through the GTI and TALIS studies of the OECD. These include instructional practices (quality of discourse, quality of the subject matter presented and cognitive involvement of the student) and the formative profile declared by the teachers.

The academic profile of aspiring teachers

Aspiring teachers have been analyzed in the literature from many points of view. A frequent question is who enters the teaching profession and why? In this regard, Fray and Gore's (2018) review of empirical studies published between 2007 and 2016 addresses the question of what are the main factors affecting the choice of teaching as a career. Of seventy articles analyzed, it stands out that in most of them the weightiest factors have to do with intrinsic and altruistic motivations.

However, beyond motivations, special attention is paid to the academic and cognitive characteristics of aspiring teachers, due to the link with the results of various assessments of the performance of education systems. In 2006, the PISA program (OECD, 2008) surveyed students in all participating countries about what they saw themselves working on their 30th years old. Only 5% of those surveyed saws themselves working as teachers or professors, the most worrying fact being that these are precisely students whose results in reading and mathematics skills are below average.

Along the same lines, the study conducted by Han (2018) analyzes, among other things, the academic profile of PISA 2015 students who declare themselves aspiring to be teachers, who are those who, when faced with the question "What kind of job do you hope to have when

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you are 30 years old?" answer teacher in general, primary school teacher, secondary school teacher or special education teacher. It is supported by the OECD study (2018) which reports that about 59% of science teachers and 68% of teachers of all other subjects have already chosen to go into teaching at the end of secondary education.

S.W. Han (2018) classifies the 50 countries included in his analyses into 5 groups based on the performance exhibited in PISA of the group of young people who declare an interest in teaching as a career versus students with interests other than teaching. In group 1, composed of Korea, aspiring teachers show higher performance in mathematics than the non-teaching interest group. In group 2, composed of Austria, teacher candidates achieve higher performance in reading comprehension and equal performance in mathematics. In group 3, composed of Canada and Finland, those interested in teaching perform as well in reading comprehension as the other group and perform worse in mathematics. Group 4 is larger, with 17 countries, and aspiring teachers achieve the same performance in reading literacy and mathematics as the other group. Finally, in group 5, composed of a total of 29 countries, those who wish to become teachers perform worse in both mathematics and reading comprehension than the group of students with interests other than teaching. This distribution is already an illustration of the weaker pre-university academic trajectory of aspiring teachers (for more detail, see Table 1, on page 146 of 2018 Han's article).

Spain's results are classified in group 5, in reading comprehension there is a difference between these two groups of 23.09 (standard deviation = 5.41) points on the PISA scale, placing the group of aspiring teachers (493) below the Spanish average and the OECD average. In mathematics proficiency, the difference between aspiring and non-aspiring teachers is 27.62 (standard deviation = 5.42) points on the PISA scale, placing the group of aspiring teachers (475.79) below the Spanish and OECD averages. As already highlighted, the Spanish case is not unique in the context of the Han teacher job, although it clearly shows that 15-year-old students who wish to become teachers tend to exhibit a weaker academic profile than those with other career aspirations.

This line of evidence is also supported by the results of the *Survey of Adult Skills* PIAAC (*Programme for the International Assessment of Adult Competencies*) (OECD, 2016), which shows that the low qualification of those who aspire to become teachers coincides with also low

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performances obtained by practicing teachers in similar tests. And by Ingvarson's (2016) work in Australia, which uses as an indicator the score on the *Australian Tertiary Admission Rank* (ATAR) scale that reflects the student's academic trajectory in secondary education. However, also in Australia, Gore et al. (2016), who conducted a study with 6492 Australian primary, secondary and high school students, concluded that the significant differences between students who expressed their intention to pursue a teaching career and the others were not so much in prior performance but in intrinsic service and vocational motivations.

This data set seems to support the so-called negative selection hypothesis (Denzler and Wolter, 2009; Guarino, Santibañez and Daley, 2006; Hanushek and Pace, 1995) which holds that teacher candidates show weaker academic, cognitive and individual characteristics than students who choose other professional or knowledge areas.

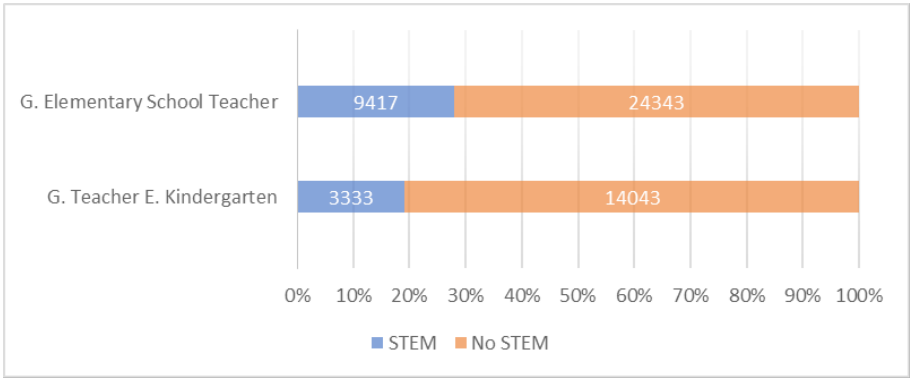
However, other authors (Roloff-Henoch, Klussmann, Lüdtke, & Trautwein, 2015) identify as sources of differentiation the science-type baccalaureate (or not) and vocational interests as the most relevant elements in determining the choice of aspiring teachers. In this study, the authors claim that the real differences occur between these two groups of students (science and non-science baccalaureate), while controlling for this academic background, the demographic and personal differences between aspiring teachers and others are neutralized. This is a relevant hypothesis that identifies a characteristic present and generalized in those students with an interest in the professional practice of teaching, since the majority come from a non-scientific baccalaureate.

Some preliminary analyses along these lines are being carried out in the ProTeacher[2] Project led by Castro and Gaviria. In an essentially descriptive way, some data from the Integrated University Information System (SIIU) of the Ministry of Universities of the cohorts corresponding to 2014-15, 2015-16, 2016-17 and 2017-18 of the entire Spanish University System (SUE) are presented. In those four academic years, there have been 51,136 students who have been admitted to the degrees of Teacher of Early Childhood Education and Primary Education. As can be seen in Graph 1, most students come from non-science baccalaureate degrees (No Stem), being 80.81% of the students in the case of the Degree in

(2) RTI2018-099365-B-I00: Aptitudinal, attitudinal, and prior academic performance profile of teacher education applicants: implications for selection into university entrance (PROTEACHER).

Early Childhood Education and 72.10% in the case of the Degree in Primary Education.

CHART I. Distribution of teacher degree students according to the baccalaureate at origin (frequencies and percentages relative to each degree).



Source: Prepared by the author based on data from SIIU.

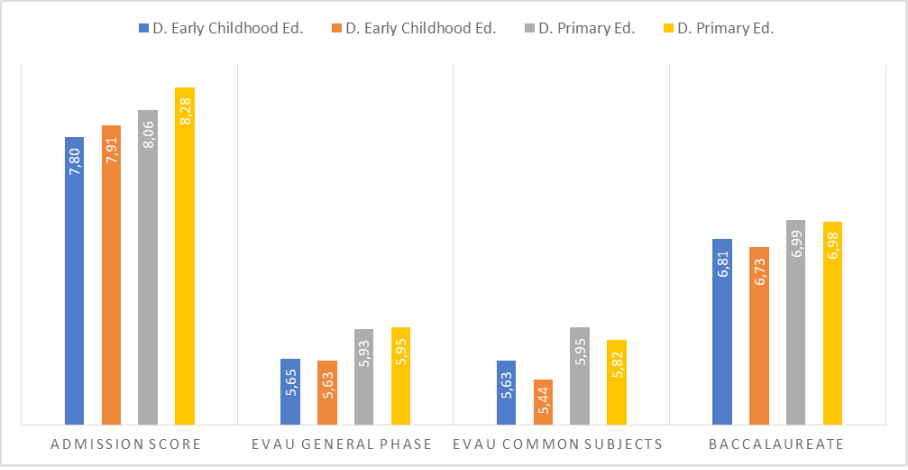
Students who access the teaching degrees in the SUE do so with an average grade of 7.88 for the Degree in Early Childhood Education and 8.22 for the Degree in Primary Education. These values represent 56.3% and 58.7% of the maximum possible score for access to Spanish universities, respectively. The access score to the degree weigh the baccalaureate scores and the various electives that each student has chosen to take in the University Entrance Examination (EvAU). It is therefore an indicator of the demand for these studies and of the difficulty of accessing them in relation to other university degrees. And what it shows is that the possibility of accessing teacher training is at a level of demand located around the arithmetic mean of the scale.

The study of academic qualifications prior to entering teacher training in Spain is also revealing. Figure II shows four indicators of academic performance prior to university entrance for students who choose the Degree in Early Childhood Education and Primary Education: admission score to the degree (weighted EvAU score), score in the general phase of the EvAU (average results in the unweighted university entrance exam),

average in the three common subjects of the EvAU (Spanish Language and Literature, Foreign Language and Spanish History) and grade in the baccalaureate. The averages are shown segmented according to the scientific (STEM) or non-scientific (non-STEM) baccalaureate of origin.

Regardless of the scale on which they are measured, these four indicators show a common tendency, the academic average of those who enter the teaching studies, with certain differences being observed depending on the baccalaureate of origin. The population data show that students entering the Degree in Early Childhood Education who have taken a non-scientific baccalaureate only have a higher level of previous performance in the grade for admission to the degree, while in the common subjects of the EvAU and in the average of the Baccalaureate, students whose baccalaureate was scientific have higher scores. Something similar occurs in the students who access the degree of Primary Education, since those who show a higher level of performance in the three common subjects of EvAU are the students who have taken a scientific baccalaureate. It is also observed that the overall levels of performance in any of these four indicators are higher for Primary School students.

CHART II. Academic profile of students in teaching degrees before entering university by baccalaureate of origin.



Source: Prepared by the author based on data from SIIU.

Only performance in the three common subjects of the university entrance exam can provide a directly comparable indicator of teacher's achievement before university entrance. The study of mean differences in the three common subjects of the EvAU in the Degree of Early Childhood Education between students coming from scientific (mean = 5.63**, standard deviation =1.28) and non-scientific (mean = 5.44, standard deviation =1.27) baccalaureate shows statistically significant differences (α = 0.01), in favor of the former. The same occurs when comparing the scores in the Primary Education Degree for those with a scientific (mean = 5.95**, standard deviation =1.31) and non-scientific (mean = 5.82, standard deviation =1.31) itinerary. It can be affirmed that students coming from a scientific baccalaureate obtain better grades in these three common subjects than their classmates who chose the same studies and came from a non-scientific baccalaureate, confirming the importance of this variable. Note that the subjects that make up this average have an essentially "lettered" academic content.

At initial teacher education, there is a higher proportion of students who have taken a non-scientific baccalaureate, they also have a significantly lower comparative performance in the three common subjects of the university entrance exam than their undergraduate classmates who opted for a scientific pathway. This shows the relevance of this variable, especially in teacher training studies, since it seems that in addition to a comparable low initial performance in university entrance exams, there is also a majority presence of students from a non-science baccalaureate who systematically obtain a lower performance.

Thus, the academic profile of Spanish applicants to teaching studies would be characterized by significantly lower performance in the reading and mathematical competencies evaluated by PISA; in university entrance and baccalaureate performance, they are students with results at an average level, whose academic trajectory comes mostly from a non-scientific itinerary during baccalaureate, being also those who have lower performance in the common elements of the university entrance exam compared to those who come from a scientific baccalaureate.

Training and common teaching practices: what do teachers say what they do and do what they do in the classroom?

It is important to know what practicing teachers say about their training, what they say about their teaching and what they do in the classroom. Two OECD studies focus specifically on teachers: TALIS (*Teaching and Learning International Survey*), which, as a large survey, focuses on what teachers say, and *Global Teaching Insights*, which, as a study of teaching practice, focuses on what teachers do. Both studies are cross-national in nature, one and the other with Spanish samples.

Global Teaching Insights (GTI) (OECD, 2020a) is a study on teaching practices observed and assessed in a comparative way, defined as a "video study". It is based on a pretest-posttest design, includes a varied set of measures on teaching (classroom management, socioemotional support and instructional practices in the classroom), obtained with a wide set of data collection techniques such as observation, questionnaires, tests and analysis of teaching materials in 700 classrooms in eight different countries (including Spain, with classrooms in the Community of Madrid). There were 85 teachers per country, which is not a small sample for this type of study. The teaching area is mathematics in 2nd ESO (8th grade). The final objective is to assess the quality of teaching (OECD, 2020b).

The general results show different behaviour in the three major factors studied. It is observed that teachers manage their classes well (averages between 3.49 and 3.81 on a 4-point scale) and offer social and emotional support (averages between 2.62 and 3.26 same scale) in all the countries studied. Compared to these two, the weakest factor in all of them is the assessment of the quality of instructional practices, with an average of less than 2.25 (moving from 1.74 to 2.24) on a 4-point scale (OECD, 2020a).

The instructional quality factor is a complex factor (for a detailed description, see Chapter 5 of OECD, 2020a) that assesses elements such as the quality of discourse and reasoning, the quality of the topic explained (through explicit connections, explicit patterns, and generalizations), the cognitive involvement of the task for the student, and the evaluation of responses.

The GTI results reveal that teaching (mathematics) occurs, in general terms, through a repetitive practice in which teachers use technology essentially as a means of communicating with students and scarcely to

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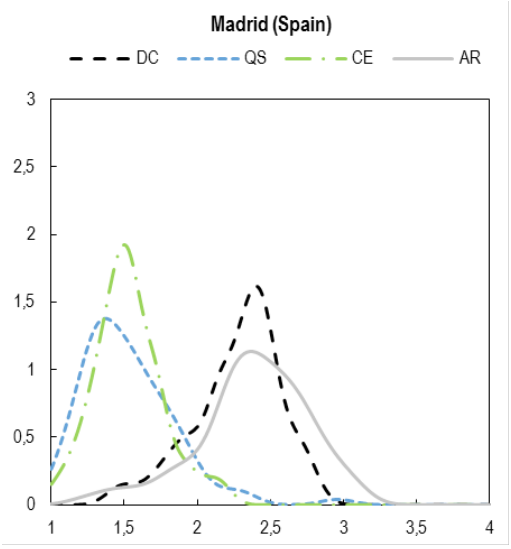
deepen conceptual understanding. The report also highlights that few teachers provide feedback to students on why their reasoning is correct or incorrect (rates below 20% in most of the countries analyzed). Great variability is observed in the quality and depth of teachers' discourse, which shows differences in the length and depth of their explanations to students (from 56% of teachers in China (Shanghai) or Japan, to 19% in Spain (Madrid), and reaching the lowest values in Colombia or Mexico of 7%). The lowest scores for instructional practices were obtained in the assessment of subject quality (with differences from 1.36 to 1.97 on the 4-point scale) and cognitive involvement (ranging from 1.48 to 2.07 on the same scale) in all eight countries/economies included in this report. Figure III reproduces the distribution of the Spanish sample in the four subdimensions of instructional quality and allows us to observe the weak quality of the subject matter taught and of the classroom processes that promote the cognitive involvement of the student.

CHART III. Distribution of classes in Spain (Madrid), by mean scores in the sub-domain scores: observed quality of discourse (DC), quality of the subject matter (QS), cognitive engagement (CE) and assessment of and responses to students understanding (AR) in the classroom.



Source: OECD (2020a). Global teaching insights: a video study of teaching. Paris: OECD Publishing, pg. 121.

If the GTI report were to be taken as a reference for the adoption of measures to optimize the teaching activity, most of them should be related to instructional quality: improvement of the practices proposed to students, depth of the reasoning and knowledge presented and development of strategies and activities to improve the cognitive involvement of students, as well as the expansion of the world of learning through the incorporation of technology beyond communication facilities, which, on the other hand, students already use to learn in this context of the information and learning society.

What teachers say about their training and performance in practice has been studied more profusely. Following the OECD studies, the reference is TALIS (OECD, 2018), which is a large survey aimed at Primary and Secondary Education teachers about their initial training, professional development, teaching practices and professional satisfaction. In the 2018 edition, a representative Spanish sample of 7246 Primary E. teachers and 7407 Secondary E. teachers participated (MEFP, 2019a and 2019b).

In relation to teaching practice, TALIS asks for various indicators. We will focus on the teachers' stated description of their teaching practice in the same elements observed in the GTI study, as judged through the external and direct evaluation of teaching practice.

As a teaching practice, teachers report that they let students practice with similar tasks until they understand the subject matter. The Spanish sample of primary school teachers indicates that 84% of them do this "frequently" or "always". Of the 9 countries responding to this survey, only Denmark (63%), France (58%) and Japan (56%) are below. Consistently, only 32% of Spanish primary school teachers assign students projects once a week, Spain being the country with the highest percentage in this indicator, and 42% let students use ICT resources to carry out class projects or exercises, with three countries above (Denmark (58%), Turkey (57%) and Sweden (51%)). According to this study, these last two indicators are associated with the teaching enrichment construct.

TALIS also measures the cognitive activation construct through four indicators: presenting tasks for which there is no obvious answer, presenting tasks that require critical thinking, having them work in small groups to find a joint solution, and inviting them to decide which procedure to use to solve complex tasks. In Spain, primary school teachers report doing this "frequently" or "always" in 45%, 65%, 63% and 55% respectively.

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The profile of secondary school teachers is like that of primary school teachers, except for the decrease in practice with similar tasks (77%) and the increase in the possibility of students using ICT resources (51%).

All these practices declared in the TALIS study are consistent with those evaluated through the GTI study, i.e., essentially the same recommendations could be made on teaching processes aimed at improving learning.

It is reasonable to think that the instructional quality described by Spanish teachers has a certain correlation with the training received. Eighty-five percent or more of the primary school teachers in TALIS state that they have received formal education in the content (86%) and pedagogy (85%) of the subjects they teach, general pedagogy (96%) and teaching practice in the subjects they teach (86%). These percentages are not far from the rest of the countries participating in the study. In this sense, Spanish teachers have received training like that of the rest of the teachers participating in TALIS. Although there are some differences. The specific note on Spain points out that, during their initial education and training, 48% of teachers in Spain have studied their own subject content, specific and general didactics and classroom practice, a proportion that is lower than the average in the OECD countries and economies participating in TALIS (79%). However, in the last 5 years, the Spanish percentage rises to 68%.

This data may be particularly relevant to understand the Spanish situation. Looking at results of the systematic review Coe et al. (2014) there is strong evidence of a direct relationship between the level of knowledge of a teacher regarding the content they are teaching, and the gains obtained by their students. The most effective teachers have a deep knowledge of the subjects they teach and that a lack along these lines will have negative effects on their students. And this knowledge of one's subject matter has to be compatible with an understanding of how their students will process that information, how they will best understand it, what the most common misconceptions are, etc.

Differences with the countries included in the study are also found in the indicators on formal education in the use of ICT (49% in the Spanish sample, although in the last 5 years 90% of teachers say that they have received formal education in the use of ICT), student behaviour and classroom management (58%) (which does not seem to be a difficulty, according to GTI) and supervising student development and learning

(72%). In all cases, Spanish teachers are in third to last position a total of 9 countries, with the difference being particularly marked in the case of ICT use.

The profile declared by Secondary Education teachers in the first four indicators mentioned is like that of Primary Education and like the OECD and EU averages. The greatest differences are found in the indicators of formal education in the use of ICT, where 38% of the teachers in the sample report having received such training in secondary education, although if we differentiate between teachers in the last 5 years, this value exceeds 80%. This last figure is in line with the averages obtained for the OECD and the EU. Another figure that illustrates the differences in the training of secondary school teachers in Spain is related to the supervision of student development and learning, where only 50% of teachers report having received formal education on this point, although among teachers in the last 5 years this percentage rises to 75%, which is a value more in line with the OECD and EU averages.

The data collected in both OECD studies reveal an internal consistency that is noteworthy, as it reveals weaknesses and strengths in teaching practice reflected both in the study of teaching practice *in situ* and in the study of practices and training reported by practicing teachers. It is also noteworthy that the behaviour of Spanish teachers does not differ greatly from that of the countries studied as a whole. In this sense, teaching performance and training received is comparable to that of teachers in the countries studied, except for training in disciplinary content, which is clearly inferior in the OECD context.

So, are Spanish teachers unique?

The synthetic answer to this question is no.

When entering university studies, aspiring teachers in Spain have a discrete academic trajectory, which is similar in their performance to that of many other future teachers in OECD countries. Their majority profile comes essentially from a non-scientific baccalaureate, in which they show lower performance levels than their fellow aspiring teachers who take their baccalaureate in the scientific branch.

In the description that practicing teachers give of their initial training, there are no differences with the rest of the OECD countries. The absence

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of training in the disciplines they teach, and the ICT training reported by teachers is noteworthy, with the Spanish value being at a great distance from the OECD average. Nor are there major differences in teaching practices (both declared and externally evaluated). Even in the most deficient area, instructional quality, Spanish teachers' evaluations are similar to the rest of the practices observed in the OECD context. This improvable instructional quality could be focused on the type of stimuli and practices proposed to students for learning, on the depth of the reasoning exposed and on the generation of specific feedback to each student on the successes and mistakes they make in the learning process.

So no, they are not very different. Perhaps it is good to bring here the general sense of Hattie's (2008) findings, which is that in education almost everything works, and therefore it is important to look for those teaching interventions that are more effective than others. In view of the studies analyzed, Spanish teachers do not stand out negatively either in their training or in their intervention compared to those of other educational systems. However, given their differential position, located in the centre or at the limit of the lower third of the distributions (in training or in some elements of teaching practice), their impact on school performance may not be particularly noteworthy, at least in comparison. In other words, teachers perform their work like the rest of the elements of the Spanish educational system (academic performance, international performance indicators, educational spending, etc.), in an average range with room for improvement.

Presentation: *Teachers for the 21st Century: Access to Studies and the Teaching Profession*

To get out of this middle ground, there is a wide menu of proposals for improving teacher training and practice. The definition of the set of actions for better prepared teachers in our classrooms involves identifying the origin to which the area of improvement is related. If it is located at the time of access to studies and the entry profile of aspiring teachers, the proposals are related to improving the mechanisms and requirements for access to studies. If it is related to the weak training received (whether of a disciplinary or pedagogical nature or of a professionalizing nature), the proposals are related to the university training offer. If it is attributed to

access to and maintenance in the teaching profession, the proposals are usually related to optimizing teacher training, diversification of access systems and improvement of working conditions.

I bring here the reflection of M. Fernández-Enguita (2020) which, although debatable and in need of empirical research support, outlines a plan for joint updating in all the formative and professional milestones of teachers:

> "*It is now commonplace that the teaching profession must change, but how? First, with more demanding initial training and selection, which must and can go hand in hand. Second, that this initial training should be more solid and more scientific, not "in the truth" or anything like that, but as the necessary, though not sufficient, basis for reflective professionalism and lifelong learning. Third, with a high level of digital competence, since this is today what literacy was yesterday, indispensable for teaching and learning management. Fourth, a sufficient period of induction by employers and colleagues, and not by the university, prior to full qualification. Fifth, collaborative working conditions, in the field, based on co-teaching and also on non-teaching activity*."

And this is the central question addressed in this monograph, which offers research results and reflections supported by evidence on the teachers we want and need in the 21st century. This volume contains 13 contributions that provide diverse evidence and reflections for the optimization of the teaching career from its beginnings to in-service training.

The work of Egido Gávez focuses on effective policies to support the professional induction to teaching, analyzing the well-known educational MIR from an international perspective that allows him to identify the features that characterize the induction programs to teaching based on the clinical approach that have obtained better results in other countries, as well as the main recommendations of two International Organizations, the OECD and the EU in order to infer the possibility of its application and the requirements that should be met to successfully implement this model in the Spanish educational system. In this same area of reflection, the essay by López Rupérez focuses on the analysis and impact of two models of access to the teaching profession, the models by delegation and the models by cooperation, linking it to the professional development of teachers as the central axis of teacher-centered policies.

The bulk of the contributions are related to teacher training. The article by Arnaiz, Escarbajal, Alcaraz and de Haro starts from the premise that a well-trained professional committed to the postulates of inclusive education. The article gathers the results of research on the so-called "*open classrooms*" to analyze the training of teachers and other professionals to meet the special educational needs of students who require extensive and generalized support. The article by Sánchez-Serrano, Alba-Pastor and Zubillaga del Rio, on the insufficiency of initial training in educational attention to diversity, examines the training of teachers and other professionals to meet the special educational needs of students requiring extensive and generalized support. They carry out an examination of the training on inclusive education by reviewing the curricula of the curricula of the Primary Education Teacher degrees of the 39 Spanish public universities, showing the variability in the contents and approaches as well as the strengths and weaknesses of the same. Montoro Medina's work analyzes the inclusion of STEM education in the initial training plans for Primary Education teachers in force in Spain. A documentary analysis of the 236 teaching guides of basic or compulsory subjects related to STEM areas in Spanish public universities is carried out.

The contribution of Otero-Meyer, Velaz de Medrano and Expósito-Casas studies classroom activities in Early Childhood Education in order to suggest changes and improvements in university training in this degree, through a set of empirical data collected through a controlled observational study in a large sample of classrooms and centers that teach the first cycle of Early Childhood Education in 4 Autonomous Communities of Spain. The work of Martínez Izaguirre, Yániz Álvarez de Eulate and Villardón Gallego analyzes teachers' perception of the degree of relevance of the competencies attributed to their professional profile, as well as their level of application in practice based on their active reflection in a large sample of Primary and Compulsory Secondary Education teachers.

The work of Rodríguez, González and González uses the 2019 Labor Market Insertion Survey of University Graduates, which collects data from a large sample of graduates in Spanish universities to study in a comparative way the degree of acquisition of ICT and language skills by teachers, given the relevance in the labor market. The results show that, although teachers have a higher level in both skills than other

professionals in the social welfare system, the values are lower than those expressed by STEM professionals.

Azpillaga, Bartau, Aierbe and Intxausti link school improvement in the Basque Autonomous Community with teacher training, linking student results with the school as an organization and teacher training. The research incorporates mixed methodology by applying multilevel models and focus groups to a wide range of schools. The results show that in all the centers, teacher training and professional development is important and there is a relevant investment for its promotion, differentiating measures for high and low efficiency centers.

Oliver-Trobat, Rosselló, Comas, Calvo y Sureda's work focuses on the processes of improvement in the access to teaching studies. It presents the process of design, elaboration, implementation, and validation of ad-hoc admission tests for the admission of students to the Teacher's Degrees in Early Childhood and Primary Education in a participatory context. Manso and Garrido-Martos analyze the perceptions on initial training and access to the profession of active teachers of Compulsory Education in Spain through the perceptions of a large sample of teachers. Within the heterogeneity of the group, teachers show a negative evaluation of the current systems of both initial training and access to the profession, pointing out differential measures by groups.

Jiménez, Arroyo, Hurtado, Ruiz, Sánchez, Illana and González-Barbera studied the vocational and performance profiles of student teachers (as opposed to other care professions) in a large sample of students in the first year of university studies at the Complutense University of Madrid. It is observed that the previous academic trajectory is a strong determinant of success in the first year of university, when the highest level of dropout occurs.

Finally, the paper by Navarro, López-Martín, Asencio, Expósito, Carpintero and Ruiz deals with the use and characteristics of the most widely used test worldwide to measure teacher motivation, the FIT-CHOICE (Factors Influencing Teaching Choice) instrument. The reliability of the different scales used and their variability among the works that use it are analyzed, with the reliability generalization meta-analysis technique, pointing out the good reliability of most of the subscales, with some exceptions, and the great variability of this psychometric indicator among studies, being linked to the characteristics of the FIT-Choice used and to the type of teacher.

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In 1937, Freud wrote that, until the advent of psychoanalysis, there were two impossible professions: governing and educating, considering the permanent insufficiency of the results. There is always something that will not be achieved. Psychoanalysis added the third one. However, let us not cease to aspire to good government, good health, and good education.

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Teacher Training for the Construction of Classrooms Open to Inclusion[1]

Formación del profesorado para la construcción de aulas abiertas a la inclusión

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Abstract

Teachers of the 21st century must be competent to respond to the challenges of the new millennium, as it requires a well-trained professional who is committed to the postulates of inclusive education. The objective of this article is to analyze the training of teachers and other professionals to meet the special educational needs of students who require extensive and generalized support. A non-experimental, descriptive and survey-type research design was used for our investigation. The population group is characterized by the set of specialized open classrooms in the Region of Murcia during the 2018/19 academic year, a total of 108 open classrooms and 1043 teachers or professionals. The selection of the sample was carried out through a non-probabilistic convenience sampling, involving 88 specialized open classrooms and 490 professionals (tutor of specialized open classroom, tutor of reference classroom and the teaching and professional team of these classrooms). To collect the information, three ad-hoc questionnaires were used for the tutor of the specialized open classroom, the

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tutor of the reference classroom, and the teaching and professional team of the specialized open classroom. The data analysis has been carried out using a quantitative approach with descriptive statistics, inferential analysis based on socio-demographic variables (sex, dedication, educational stage, ownership of the center, professional profile, experience in the center, experience with the group of students and age) and correlational analysis. The results indicate the lack of training and ability of the participants when facing the response to the educational needs of the students enrolled in specialized open classrooms. This situation is more pressing in the non-specialist teachers in attention to diversity. Likewise, we highlighted a positive correlation between the training received, the knowledge of the open classroom and the development of planning functions and curricular adjustments to offer inclusive responses to students who require extensive and generalized supports.

Key words: training, inclusive education, teachers, primary education, secondary education.

Resumen

El profesorado del siglo XXI debe ser competente para responder a los retos del nuevo milenio, un profesional bien formado y comprometido con los postulados de la educación inclusiva. La finalidad de este artículo es analizar la formación del profesorado y otros profesionales para atender las necesidades educativas especiales del alumnado que requiere apoyos extensos y generalizados. Se utilizó un diseño de investigación no experimental, descriptivo, tipo encuesta. La población está caracterizada por el conjunto de aulas abiertas presentes en la Región de Murcia en el curso académico 2018/19, un total de 108 aulas abiertas y 1043 docentes o profesionales. La selección de la muestra se realizó mediante un muestreo no probabilístico por conveniencia en el que participaron 88 aulas abiertas y 490 profesionales (tutor/a aula abierta, tutor/a aula de referencia, y el equipo docente y profesional de estas aulas). Para la recogida de la información se utilizaron tres cuestionarios elaborados ad hoc, dirigidos al tutor/a de aula abierta especializada, tutor/a de aula de referencia, y equipo docente y profesional del aula abierta especializada. El análisis de datos se ha realizado desde una aproximación cuantitativa a partir de estadísticos descriptivos, análisis inferencial, en función de variables sociodemográficas (sexo, dedicación, etapa educativa, titularidad del centro, perfil profesional, experiencia en el centro, experiencia con el grupo de alumnos y edad), y análisis correlacional. Los resultados indican la falta de formación y capacidad de los participantes para responder a las necesidades educativas del alumnado de las aulas abiertas, siendo esta situación más acuciante en el profesorado no especialista en atención a la diversidad. Asimismo, se muestra una correlación positiva entre la formación recibida, el conocimiento del aula abierta y el desarrollo de funciones de planificación y ajustes curriculares, para ofrecer respuestas inclusivas al alumnado que requiere apoyos extensos y generalizados.

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Palabras clave: formación, educación inclusiva, docentes, educación primaria, educación secundaria.

Introduction

The 2030 Agenda and its Sustainable Development Goals (UNESCO, 2105a; 2015b), itemises 169 goals and 232 indicators focussing on the main social challenges of the 21st century. More specifically, SDG 4 (Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all) is the framework supporting this paper on training teachers in inclusion. Teachers in the 21st century must be able to respond to the challenges of the new millennium, as it requires well-trained professionals who are committed to their job, with social recognition in regard to the importance of their work and being passionate about ongoing learning and teaching (Dieste, Coma and Blasco- Serrano, 2019). Regarding this topic, research by Hattie (2003) concluded that teacher quality is the main variable to obtain good schooling results and/or to improve on them. In another piece of research, the same author (Hattie, 2009) proved that teachers who receive feedback from their assessment, value and improve their work.

From this standpoint, a study by Navarro, López and Rodríguez (2021) analysed the training beliefs and needs that teachers have in regard to inclusive education, highlighting that inclusion is still understood in many cases as a synonym of integration. This study showed that 37.5% of teachers in infant and primary education, and 25% in secondary education believed that their centres were not ready to respond to the demands of inclusive education, and only employed "palliative" solutions. The study also showed that 18.75% of teachers at all levels of education believe that they are suitably trained to deal with all pupils, with the exception of secondary school teachers (who do not appear to be sufficiently well trained to cater to the needs of pupils with special education needs). Furthermore, 12.25% of infant and primary school teachers believe that a very high ratio impedes being able to deal with individual differences; and 25% of secondary school teachers claim that the subject of inclusive education needs to be rethought, although 31.25% believe that the idea

of inclusion could transform today's educational system, with this belief being shared by 18.75% of infant and primary school teachers. Another relevant piece of data is the lack of teachers who are trained to deal with inclusion goals (18.75% in infant and primary education, and 31.25% in secondary education), and the difficulty of the conceptual perspective by considering inclusion as only for special needs pupils.

It has been demonstrated that specific training on diversity, in the use of concrete methods for this teaching, is a fundamental requirement that all teachers should have in order to achieve significant learning in pupils with special educational needs. This is discussed in the research by Larraceleta (2020) on practices based on evidence established by the US National Professional Development Center on Autism Spectrum Disorders, directed by teachers for the education of Autism Spectrum Disorder (ASD) pupils, with the aim of improving their social, communication and academic skills at education centres.

Other studies (Angenscheidt and Navarrete, 2017; Friesen and Cunning, 2020), on the skills, beliefs and knowledge of teachers on inclusive education, concluded that a strong commitment is required towards pupil centric learning and on inclusion practices in the classroom to ensure the best attitudes and more democratic teaching. Therefore, these authors believe that creating an environment of inclusion for the development of pupils is the basis of any teacher training programme.

Along these same lines, Specht et al. (2016) claim the importance of inclusion in teacher training, as do Hutchinson (2017) and Sharma and Sokal (2016), who showed that teachers who are trained to improve their attitudes towards inclusion, produce more inclusive teaching practices. There are studies that clearly show the correlation between attitudes by teachers towards inclusive education and the effectiveness they perceive in developing inclusive teaching practices. Consequently, positive attitudes towards inclusion are a determining factor for more effective educational practices from the perception that teachers have (Savolainen, Engelbrecht, Nel and Malinen, 2012; Woodcock and Faith, 2021; Yada and Savolainen, 2017). Likewise, with less positive attitudes towards inclusion, teachers show moderate levels of self-efficacy in the implementation of inclusive education, as brought to light in the study carried out by Bawa, Desai and Umesh (2020). In addition to the above, in the research by Desombre, Lamote and Jury (2019), generalist teachers reported poorer attitudes and less efficacy in regard to developing inclusive practices than

teachers specialising in diversity. This highlights the need to develop positive attitudes towards inclusion in teacher training programmes.

Finally, attention must be brought to the research coordinated by Echeita and Simon (2020), sponsored by the Ministry of Education and Vocational Training, analysing four educational systems (Italy, Portugal, Canada and United Kingdom) in relation to special education centres. In their conclusions they emphasised the empirical need for teacher training, particularly ongoing training, on diversity and inclusion in order to meet the challenges of building flexible, open, personalised syllabuses, taking into account the Universal Design for Learning (UDL) designed at the Center for Applied Special Technology (CAST).

In view of the aforementioned research papers, one of the main challenges teacher training today faces, and training of other professionals, is preparing them for the challenge of quality, equitable and inclusive education in a changing, uncertain, complex and deeply unequal society, in a context of uncertainty and the information society (Navarro et al., 2021). But why not promote true inclusive education? What are the most effective methodologies to implement it? Teachers perhaps ask themselves these and other questions, since they face them on a daily basis in the classroom, to which others could undoubtedly be added: Was I trained and can I continue to be trained to ensure the challenge of guaranteeing inclusive education for all materialises?

Where there seems to be no room for argument is that in order to achieve, quality, inclusive education, we need committed, well-trained professionals. Obviously, to achieve this, the initial and ongoing teacher training needs to be improved, teaching practices and educational policies need to be improved, and research and innovation on more effective teaching is required (López, Rupérez, 2014). This idea is shared by the Organisation of Ibero-American States for Education (OEI, 2013), since they consider improvement in basic teacher training as one of their specific goals (within the Education Goals Project 2021), encouraging ongoing training, developing professional careers and quality teaching. In this sense, implementing measures to improve teaching quality would be desirable, such as making the teaching profession more attractive, dignifying the image of teachers, developing better skills in the education profession, optimising the teacher recruitment system, improving promotion opportunities, creating education communities of teachers and involving them in the preparation of education policies. And of

course, restructuring and adapting the teacher training faculties to bring them up to date with the requirements of the 21st century (Arnaiz, 2019).

Initial and ongoing training: an unavoidable question

Except for some token particularities, teachers are not trained at university in a way that prepares them to tackle the challenges of a complex society, not to mention any training preparing them to design inclusion syllabuses (Aguaded, Rubia and González, 2013; Santos Rego, Cernadas and Lorenzo, 2014; Rodríguez, 2019), and consequently, a lot of the time university teacher training is a solid barrier preventing the adoption of inclusive approaches (European Agency, 2011; Leiva, 2012; Moriña, Sandoval and Carnerero, 2020).

Bearing in mind the above, university teacher training for Primary Education must be more versatile, which does not mean that these teachers have to be capable of being able to do everything and doing it well, but that their academic and practical training should prepare them to carry out different types of education strategies, owing to the many different situations that arise at their workplaces (Álvarez and López, 2015; Hernández Pallarés and Moñino, 2019). Therefore, through their university education, future teachers must start building their theoretical / practical knowledge that not only allows them to learn specific skills, but also, and fundamentally, to ensure they are self-sufficient to be able to deal with the many different situations they may find in their working lives (De Loor-Aldás and Aucapiña-Sandova, 2020). Consequently, training teachers to work in inclusive environments means training teachers who are ready to deal with diversity, with the cognitive, affective and practical competences and skills that they need in a complex, changing social context (Cernadas, Santos Rego y Lorenzo, 2013).

This means that universities must prepare teachers to reflect on the theory of concepts such as culture, interculturality, diversity, inclusion..., but also on categories that mark the difference between people, such as social class, gender and inequality.

The Talis Report on Teaching and Learning (National Institute of Educational Assessment, 2019) highlights that only a small percentage of Spanish teachers who take part in formal professional development programmes, regularly attend training courses and seminars or take part

in ongoing, inter-school training (Bunch, 2015; Muntaner, Pinya and de la Iglesia, 2015). Among the many reasons for this situation, we need to draw attention to the fact that the money allocated to the ongoing training of teachers has been cut back considerably since 2011. But there are also reasons related to the type of training teachers are offered.

One of the reasons for this is that all teacher training action must fundamentally have the ultimate goal of responding to problems that teachers encounter in their daily work, finding a "shortcoming in the training courses offered to teachers and the real needs that are required from the different bodies with the educational community" (González y Castro, 2012, p. 246). There does not appear to be much discussion here, but the answer must be held in context, because there are no validly applicable training recipes for any context. Teachers want training that provides them with good working tools, knowledge, techniques, strategies and methodologies, whilst also focussing on other important aspects of their training such as attitudes, feelings, interests, motivation, etc. Indeed, in research carried out in Galicia on ongoing teacher training (Santos Rego et al., 2014), it was concluded that there is still very low participation by teachers in training activities, and when they do demand training, they request action strategies that can be taught at the school itself, and in collaborative environments as a learning factor to drive improvement (Krichesky and Murillo, 2018).

The study discussed in this paper is part of a research project (EDU2016-78102-R) addressing the assessment of regulation, functioning and educational response of Specialised Open Classrooms (SOC), a specific measure to cater to diversity established in the Region of Murcia. To achieve this, it is worth pointing out the meanings of these special educational needs units at ordinary centres in regard to the approaches to inclusive education and how they are regulated. In this sense, the Order by the Education, Training and Employment Council of 24th May 2010, regulating authorisation and functioning of SOC at ordinary public and state subsidised schools in the Region of Murcia, states that this measure has the ultimate goal of ensuring implementation of the principles of educational standardisation and inclusion for pupils with extensive and generalised support (PEGS) needs in all areas of the syllabus (severe intellectual disability, autism spectrum disorders and multiple disabilities. Including pupils in these units requires a process of psychological educational assessment, and the relevant schooling report.

Indeed, according to the Order of 21st June 2012 by the Education, Training and Employment Council, establishing the general criteria to determine the real needs of teachers at Infant Schools, Infant and Primary Schools, Special Education Centres and Grouped Rural Schools, where the ratios are between 3 and 6 pupils in Infant Schools and between 4 and 7 in Primary and Secondary Education Schools. These pupils share their school timetables in Physical Education, Music, Art and Religion or Alternative subjects with the mainstream students in the classes they are assigned to, depending on their levels of competence and age, which are known as the reference classrooms. Likewise, they share common time and spaces with the rest of the students, such as celebrations of "...day", festivities, playground, canteen, and after-school activities.

The teachers in open classrooms consist of a number of professionals such as: the open classroom tutor (specialising in Therapeutic Teaching), a Hearing and Speech specialist and the teachers of the aforementioned subjects. This team is completed by other members, such as the Educational Support Assistant who helps the pupils and teachers during school hours. For open classrooms to work properly, specific knowledge on how to deal with diversity is required for appropriate undertaking of participative processes in education planning, and good coordination, communication and cooperation among the members of staff.

In view of the foregoing, the general objective of this article is to identify the perception that teachers have about how their training prepares them to deal with special educational needs of pupils who require extensive and generalised support. The specific objectives are as follows: 1) to identify the perception teachers have about their training to deal with special educational needs of pupils in order to meet their needs for extensive and generalised support; 2) to analyse the perception teachers have on their capabilities and training needs to meet the educational requirements of pupils in special open classrooms; 3) to assess the extent to which teacher training is an obstacle to meet the needs of pupils who require extensive and generalised support.

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Method

Design

A quantitative, non-experimental, descriptive design was used in this study, employing questionnaire techniques. The importance of descriptive studies must be taken into account in order to identify, describe, assess and intervene in a research problem, in this case special open classrooms and the training of teachers who work in these classrooms, as discussed by Sampieri and Fernández (2016). By identifying and analysing the training given to teachers and professionals who work in open classrooms we will be able to identify and implement changes to improve it, hence the importance of the design employed.

Population and sample

The population included in this study is defined by the specialist open classrooms in the Region of Murcia. During the 2018/2019 academic year, there was a total of 108 special open classrooms in 82 centres in the Region of Murcia. Choosing the sample was carried out by means of a non-probabilistic sampling process in accordance with suitability (MacMillan and Schumacher, 2005). More specifically, the sample invited to take part in the study included 1043 professionals involved at the aforementioned 108 classrooms. Finally, as shown in Table I, 490 professionals eventually participated, from 88 of the classrooms at 68 centres, which accounts for a confidence interval of 99% (Z= 2.576) with an error margin below 5%.

TABLE I. Distribution of study sample

	INVITED SAMPLE	PARTICIPATING SAMPLE		
	Total	Primary	Secondary	Total
Management Team Members	164	66 (61.7%)	41 (38.3%)	107
Special Open Classroom Tutors	108	64 (72.7%)	24 (27.3%)	88
Teaching and Professional Staff	771	124 (66.3%)	63 (33.7%)	295
Specialist hearing and speech teaches	108	32 (68.1%)	15 (31.9%)	47
Physical Education Teachers	108	23 (65.7%)	12 (34.3%)	35
Art Teachers	108	21 (65.6%)	11 (34.4%)	32
Religion or Alternative Subject Teachers	108	13 (68.4%)	6 (31.6%)	19
Educational Support Staff	108	26 (63.4%)	15 (36.6%)	41
Other area or subject teachers	10	5 (55.6%)	4 (44.4%)	9
Educational Therapy Specialists	5	4 (100%)	0 (0%)	4
Reference Classroom Tutors	216	78 (72.2%)	30 (27.8%)	108
Total	1043	332 (67.8%)	158 (32.4%)	490

Source: Own source

Information compilation instruments

The questionnaire technique was used to compile information, through three ad hoc questionnaires addressing: specialist open classroom tutors, reference classroom tutors and the specialist, open classroom teaching and professional staff. In order to analyse the validity of the content, the questionnaires were subjected to a panel of experts technique. To analyse the internal consistency, Cronbach's Alpha was used, producing the following values: specialist open classroom tutors (.780), reference classroom tutors (.778) and open classroom teaching and professional staff (.818).

The items in the questionnaires are grouped together in three different areas:

1. *Initial and ongoing training to meet the educational needs of pupils who require extensive and generalised support.* 5 items: initial training; centre training; training requirements; capability for pupils in open classrooms; taking training courses.
2. *Open classroom planning and coordination.* 18 items: knowledge on the organisation and functioning of open classrooms and the participation processes in planning and developing the teaching

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programme, the Individual Work Plan (IWP), syllabus adaptation (activities, methodologies and adapted materials) and Training Units.
3. Assessment of the open classroom. 11 items: implications and barriers of open classrooms for inclusion. The analysis of this field is not included in this study.

The items in the two studied fields include dichotomous items and Likert type items with four score values (1= Not at all; 2= Poor; 3= Moderate; 4; Very). Approximately half of the questions in the questionnaires were common and the other half specific for the analysed groups. To complete the information and to enhance the perspectives of the interviewees, we resorted to the item in the questionnaire not used in this study in regard to the management of the participating sites such as: Have any training/ information courses been held for the teachers of the open classroom reference groups?

Procedure and data analysis

The questionnaires were conducted through the Education Council's platform in order to make it more accessible for teachers and support staff. This followed a letter by the Education Council and research project director inviting the schools to take part in the study. A brief explanation about the purpose of the research and informed consent was included in the questionnaires. The research was approved by the Murcia University Ethics Committee.

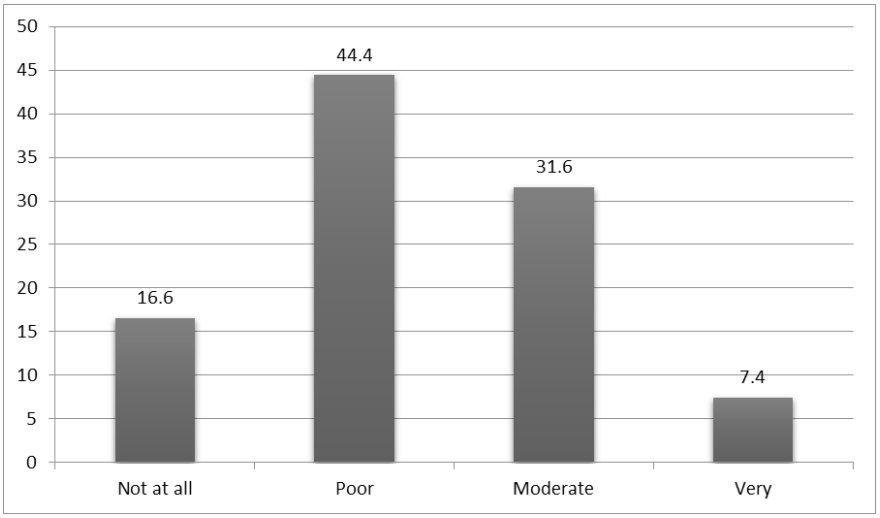
Descriptive statistics were used to analyse the data (frequencies and percentages) in order to identify teachers' perceptions on the established objectives. Inferential statistical analyses were performed to assess the existence of differences in accordance with the following variables: gender (male or female), dedication (full or part time), education stage (primary or secondary), school ownership (state or state-subsidised), professional profile linked to the diversity speciality (specialist and non-specialist profiles), years of experience at the school, years of experience with the group of pupils and age group. Since the study variables did not have a normal data distribution, as the normal distribution was not met (Kolmogorov-Smirnov test, $p < .001$) and homoscedasticity or equality of variances (Levene test, $p < .005$), we resorted to non-parametric statistics

through the Kruskal-Wallis H test and Mann-Whitney U test, arriving at a level of statistical significance of a = .05. To analyse the correlation between the variables in the two analysed fields, we employed the Spearman correlation. These analyses were performed using version 24 of the SPSS statistics package.

Results

The results showing the perception by teachers at ordinary schools on their initial and ongoing training to meet the educational needs of PEGS are provided as follows in regard to specific objective 1. As can be seen in Graph I, over half of the participating teachers (61%) stated that their initial training was not at all or only slightly sufficient (16.6% not at all and 44.4% only slightly sufficient). Therefore, only 39% of teachers believe that their training is adequate (31.6% moderately sufficient and 7.4% very sufficient).

GRAPH I. Perception on initial training to meet the needs of PEGS



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To assess the existence of possible differences according to the studied variables (gender, dedication, education stage, school ownership, specialist or non-specialist profile, experience at the centre, experience with the group and age group), the non-parametric de Mann Whitney U-test and Kruskal Wallis H-test were performed, obtaining the differences shown in Table II.

TABLE II. Differences in the perceptions on initial training to meet the needs of pupils requiring extensive and generalised support

	Mann Whitney U-test	**Sig. (bilateral)**	**Management**	
Gender	4635.50	124	Women = Men	
Dedication	3243.00	.008	Part time > Full time	
Stage	4128.50	.497	Primary = Secondary	
Ownership	4763.50	.020	State subsidised > State	
Diversity Profile	6654.000	.000	Specialist profile > Non-specialist profile	
	Kruskal Wallis H-test	**df**	**Sig. (bilateral)**	**Management**
Experience at centre	9.83	3	.020	Between 1-5 years > Over 15 years
Experience with group	1.06	3	.787	= All years of experience
Age (ranges)	3.71	3	.293	= All years of experience

Source: Own source

The results prove that there are statistically significant differences in the perception of initial training by the participants depending on: their dedication (U = 3243.00; p = .008), ownership of the school (U = 4763.50; p = .020), professional profile associated with diversity care specialisation (U = 6654.00; p < .001) and the professional experience at the education centre (chi-square = 9.83; df = 3; p = .020).

In regard to the perception on ongoing training by teachers in open classrooms, over half of the interviewees (61.8%) claim that they have undergone or are undergoing training on special educational needs; however, 38.2% state the opposite. Graph II shows the itemised values according to professional profile.

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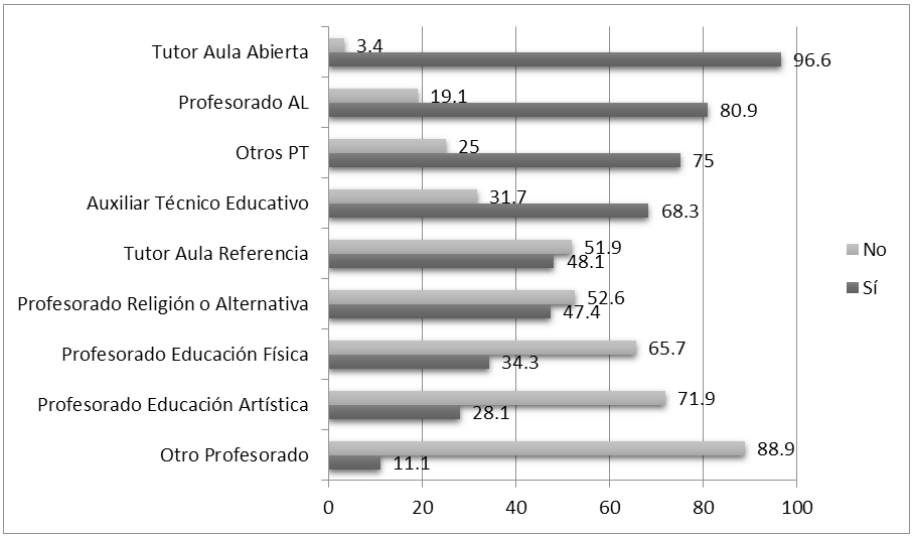
GRAPH II. Perception of the degree of ongoing training on special edcational needs according to professional profile



Source: Own source

We also assessed if their perception on taking training courses with the aim of catering to PEGS could be explained according to the study objective variables, leading to the results shown in Table III.

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TABLE III. Differences in the perception on ongoing training to meet the needs of pupils requiring extensive and generalised support

	Mann Whitney U-test	Sig. (bilateral)	Management	
Gender	4582.50	.134	Women = Men	
Dedication	3041.50	.040	Part time > Full time	
Stage	3748.00	.601	Primary = Secondary	
Ownership	4807.00	.008	State subsidised > State	
Diversity Profile	6221.500	.000	Specialist profile > Non-specialist profile	
	Kruskal Wallis H-test	**df**	**Sig. (bilateral)**	**Management**
Experience at centre	3.23	3	.356	= All years of experience
Experience with group	3.45	3	.326	= All years of experience
Age (ranges)	1.95	3	.581	= All years of experience

Source: Own source

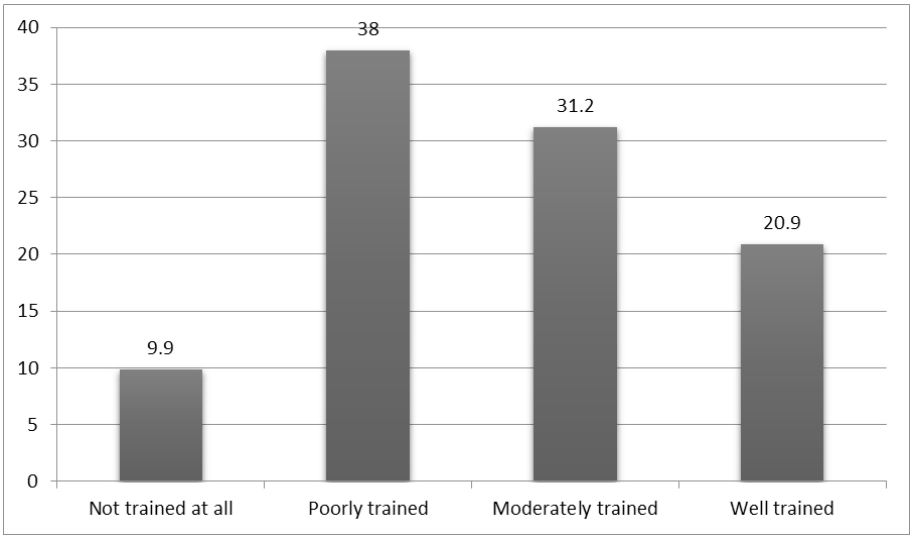
The results show that there are statistically significant differences in the perception of training action by PEGS to meet special educational needs depending on their dedication (U = 3041.00; p = .040), ownership of the school (U = 4807.00; p = .008), professional profile associated with diversity care specialisation (U = 6221.50; p < .001).

The above data contrast with the support that centres offer their teachers in regard to training action. 88.9% of participants consider that the centre where they work favours their training to meet the basic training requirements for teaching PEGS. Only 11.1% consider that the centre should provide more support for its teachers in regard to this type of training. In fact, 58.5% of managerial teams at centres with open classrooms stated training sessions had been held for teachers in the last academic year.

We shall now look at how teachers perceive their own ability to meet the educational needs of PEGS, objective 2.

Nearly half of the teachers who took part in this study (47.9%) claim that they are less able to meet the needs of PEGS than the rest of the pupils compared to 52.1% who claim they are capable of meeting the needs of PEGS.

GRAPH III. Perception of teachers on their ability to meet PEGS.



Source: Own source

The differences in the teaching ability to cater to PEGS according to the study variables are shown in Table IV:

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TABLE IV. Differences in the perception of teachers on their ability to meet PEGS.

	Mann Whitney U-test	Sig. (bilateral)	Management (less capable)	
Gender	8571.00	.100	Women = Men	
Dedication	1580.00	.002	Full time > Part time	
Stage	7637.00	.018	Primary > Secondary	
Ownership	7972.00	.007	State > State Subsidised	
Diversity Profile	3381.00	.000	Non-specialist profile > Diversity specialist profile	
	Kruskal Wallis H-test	**df**	**Sig. (bilateral)**	**Management**
Experience at centre	5.95	3	.114	= All years of experience
Experience with group	3.21	3	.360	= All years of experience
Age (ranges)	4.41	3	.220	= All years of experience

Source: Own source

The results show that there are statistically significant differences in the perception of the ability by the participants to meet PEGS depending on their dedication (U = 1580.00; p = .002), education stage (U = 7637.00; p = 0.18), ownership of the school (U = 7972.00; p = .007), professional profile associated with diversity care specialisation (U = 3381.00; p < .001).

Over half the teachers (59.5%) perceive they have a lack of training to cater to the needs of PEGS (47.1% moderate and 12.5% great need), compared to 40.5% who state they have little (34.6%) or no need (5.9%). The differences in training needs according to the studied variables are shown in Table V:

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TABLE V. Differences in the perception on training needs to cater to PEGS

	Mann Whitney U-test	Sig. (bilateral)	Management (less capable)	
Gender	9294.50	.859	Women = Men	
Dedication	2209.50	.406	Full time = Part time	
Stage	8412.00	.371	Primary = Secondary	
Ownership	8421.50	.075	State = State Subsidised	
Diversity Profile	6614.50	.000	Non-specialist profile > Diversity specialist profile	
	Kruskal Wallis H-test	**df**	**Sig. (bilateral)**	**Management**
Experience at centre	10.06	3	.018	Between 6 and 10 years > Between 1 and 5 years
Experience with group	7.81	3	.050	= All years of experience
Age (ranges)	3.76	3	.288	= All years of experience

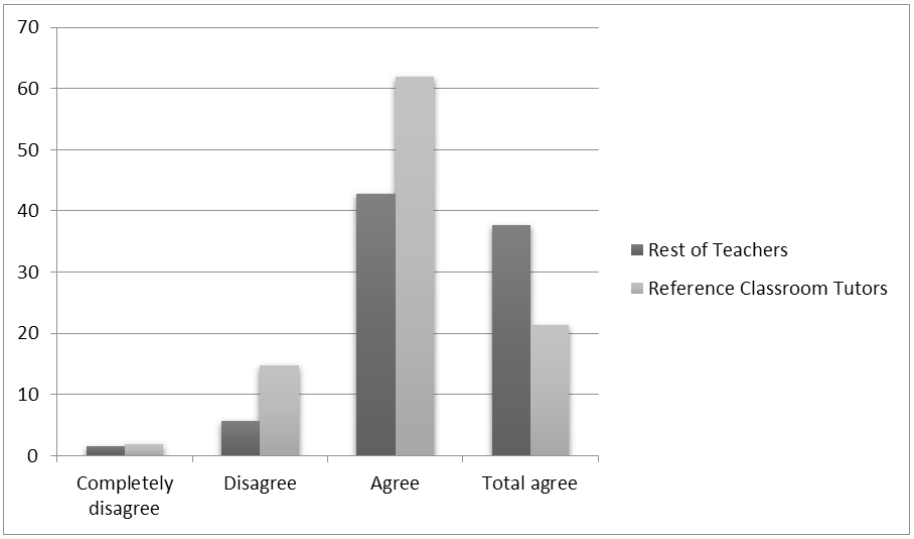
Source: Own source

The results show that there are statistically significant differences in the perception of training needs by the participants to cater to PEGS depending on: their professional profile associated with diversity care specialisation ($U = 6614.50$; $p < .001$) and their experience at the school (chi-square = 10.06; df = 3; $p = .018$).

We then moved on to identify to what extent teacher training was perceived as an obstacle for PEGS education, objective 3.

92.8% of the participants stated they fully agreed (37.6%) or agreed (42.8) to knowing the organisation and functioning of open classrooms, therefore, only 7.2% disagreed (5.7%) or fully disagreed (1.5%) with this statement. Nevertheless, as can be seen in Graph IV, in the case of reference classroom tutors, to whom open classroom pupils are assigned, the percentages on the lack of knowledge were higher (14.8% disagreed, 1.9% fully disagreed), compared to 83.3% who claimed they did know about the organisation and functioning of open classrooms.

GRAPH IV. Knowledge of the organisation and functioning of open classrooms



Source: Own source

We wanted to know if there was a statistically significant relationship between the perception teachers have about their training and the functions they require to undertake open classroom educational processes. To do so, we used Spearman's rank correlation coefficient (r_s). The findings are shown in Table VI:

TABLE VI. Correlation between training perception and open classroom knowledge

	Perception on initial training	Perception on training needs	Perception on feeling less capable	Ongoing training (Courses)
I know how open classrooms are organised and how they function	.299**	-.231**	-.517**	.319**

** The correlation is significant at level 0.01.
Source: Own source

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A direct correlation can be observed between how teachers perceive their training and the knowledge they have on the organisation and functioning of open classrooms. There is a positive correlation and weak intensity according to the perception on their initial and ongoing training (r = .299 and .319 respectively). It is negative and weak in regard to their training needs (r = -.231) and moderate according to their ability to cater to PEGS (r = -.517).

The correlation between teacher training and cooperation, coordination and communication processes among professionals (Table VII) show a direct relationship between them, although they are not very intense and are weak.

TABLE VII. Correlation matrix between training and planning and coordination variables

	Perception on initial training	Perception on training needs	Perception on feeling less capable	Ongoing training (Courses)
Coordination with the other professionals who intervene in open classrooms	.256**	-.214**	-.230**	.165*
Cooperation with the open classroom tutor in preparing, monitoring and assessing specific programmes	.202**	-.158*	-.218**	.188**
Collaboration in IWP decision making and syllabus adaptation for pupils in open classrooms	.174*	-.080	-.160*	.246**
Cooperation in adapting and preparing material, following the guidance by the open classroom tutor	.292**	-.169*	-.282**	.141
Feedback to the tutor and the rest of the open classroom team on the aspects established during individual action with pupils	.219**	-.170*	-.224**	.135
Meetings with the rest of the open classroom team members	.211**	-.117	-.105	.202**
Collaboration with the open classroom tutor in designing and adapting activities and materials	.243*	-.110	-.266**	.169

* Correlation is significant at level 0.05. ** Correlation is significant at level 0.01.
Source: Own source

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Likewise, a correlation analysis was performed to measure the degree of association between the perception teachers have about their training and the open classroom educational planning and development processes. The results are shown in Table VIII

TABLE VIII. Correlation matrix between training and planning and coordination variables

	Perception on initial training	Perception on training needs	Perception on feeling less capable	Ongoing training (Courses)
Have you taken part in preparing the Open Classroom Teaching Programme?	.109	-.090	-.207**	.175*
Have you taken part in preparing the Individual Work Plans (IWP) for each of the open classroom pupils?	.159*	-.076	-.155*	.196**
Have you taken part in preparing Training Units?	-.023	-.038	-.045	.040
Do you take part in developing Training Units?	.057	-.087	-.185*	.073
Is any prior planning carried out for the activities when open classroom pupils attend reference classrooms?	.213*	-.117	-.144	.224*
Do you design activities that have been adapted to the characteristics and needs of the open classroom pupils?	.288*	-.152	-.139	.054
Do you design methodologies that have been adapted to the characteristics and needs of the open classroom pupils?	.353*	-.117	-.136	.165
Do you design educational material adapted to the needs of open classroom pupils?	.286**	-.130	-.110	.096
Do you plan and develop group dynamics and activities in the classroom that facilitate participation by open classroom pupils?	.197	-.099	-.160	.054
Do you use specific methodologies (TEACCH, PEANA, ¿SAAC...) with the open classroom pupils?	.190	-.241*	-.119	.151

* Correlation is significant at level 0.05. ** Correlation is significant at level 0.01.

Source: Own source

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Although correlations are not very intense and are fairly weak, there is a direct correlation between the perception teachers have about their training and the educational development and planning functions carried out by professionals in open classrooms. This correlation is more recurring in the perception teachers have in regard to their initial training. The higher the perception, the greater their participation functions in planning and development of IWP and syllabus adaptation to meet PEGS needs.

Discussion and conclusions

Teacher training in the paradigm of inclusion is imperative for building inclusive schools. Therefore, Universities where initial is provided and continuous training schools are responsible for fostering training action for teachers and the other professionals who take part in inclusive schools, as defined in the Agenda 2030 (Arnaiz, 2019; UNESCO, 2015a; 2015b). To this end, they must guarantee quality, inclusive education for all, training competent teachers to meet and respond to this challenge (Dieste et al., 2019; Hattie, 2003; Mckinsey & Company, 2007). As Specht et al (2016) point out, training for inclusion must be a part of teacher training and must be given the importance it deserves.

In our study, the general perception by teachers on their initial training to encourage inclusion and to meet the educational needs of PEGS, is that their training is insufficient. The University training they are given is not valid to be able to provide quality, equitable education, and is even less valid to enable them to prepare inclusive syllabuses (Hernández Pallarés and Moñino, 2019; Santos Rego et al., 2014). Following this line of argument, the Euroepan Agency (2011), and Leiva (2012), Moriña et al., 2020 and Rodríguez (2019), have revealed that university training at the Teacher Training Faculties does not favour inclusive approaches. Hence the need to provide training for future teachers, as pointed out by Cernadas et al., (2013), that takes classroom inclusion into account, developing inclusive attitudes and the possibility of generating more equitable teaching practices (Hutchinson, 2017). Nevertheless, specialist teachers (TP and HS) consider their training is adequate. In our study, the teacher training level at private and state subsidised schools to cater to PEGS is better than in state schools, and the same is observed in the case of part time teachers and those with less experience. y

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Insofar as ongoing training is concerned, most teachers consider they carry out enough training on an individual basis or at the school where they work (Hattie, 2009). Management teams claim they encourage teacher and other professional training at the schools where there is inclusive education, and also teach knowledge on open classrooms. Nevertheless, it is the teachers specialising in diversity who carry out most training rather than non-specialists, which is more evident in state subsidised schools and in part time teachers.

This all points to the unavoidable need to review and improve initial and ongoing teacher training, particularly in regard to educational policies and teaching practices (Álvarez and López, 2015; López Rupérez, 2014). Our results agree with the Talis Report on Teaching and Learning (INEE, 2019) when it is stated that more, ongoing teacher training is required, since a significant proportion of teachers do not go through any continuous training on inclusive practices in classrooms. In this respect, we recall the comments by Echeita and Simón (2020) on the empirical need for permanent teacher training on inclusion in order to build flexible, open syllabuses.

As for the capability of teachers to cater to pupil diversity, it is extremely striking that almost half of the teachers in our centres with PEGS claim that they have not been trained to cater to their specific educational needs. These data contrast with the study by Aguaded et al., (2013) on competences by teachers to work in educational inclusion, where it was concluded that teachers believe they are competent to use inclusion techniques in education, but they do not have positive attitudes towards inclusion or sufficient tools to develop and materialise it.

Even considering the shortcomings of initial training, onging training action appears to be insufficient to be able to cater to the educational reality involving the presence of open classrooms at mainstream schools. This reality is likewise present in the studies by Angenscheidt and Navarrete (2017) in infant and primary schools, and in those by De Loor-Aldás and Aucapiña-Sandova (2020), Specht et al. (2016), Hutchinson, (2017), Sharma and Sokal (2016). In our study, this situation was more evident in state schools than in private or state subsidised schools, in non-specialist teachers, in those who work full time and in the Primary Education stage.

Therefore, over half of teachers are aware of the need for training in order to educationally meet the needs of PEGS, and this is even more

striking in the training of non-specialist teachers and those with more experience. This suggests that they have less knowledge on inclusive education and that they lean towards a more traditional approach to special needs education. Navarro et al., (2021) describe this lack of training by teachers to cater to the needs of inclusion, which on many occasions means that palliative solutions or traditional approaches to integration are applied, which are not representative of inclusion. Therefore, along with Friesen and Cunning (2020) and Echeita and Simón (2020), they lobby for permanent training on inclusion in order to build flexible, open syllabuses, taking into account the Universal Learning Design to promote more inclusive, equitable and democratic teaching practices.

This discussion is brought to a close by making reference to whether or not teachers' perception on training is an obstacle to cater to the needs of PEGS. In our study, teachers claimed that they were familiar with the organisation and functioning of open classrooms, but it is the tutors of the reference classrooms who have least knowledge about these classrooms, since they are not always the teachers of those pupils.

In this sense, there are studies that support the need for cooperation between teachers to develop and implement change and improvement processes at schools to help with an approach to inclusive education, and training in accordance with their needs and contexts (Buch, 2015; Krichesky and Murillo, 2018; Muntaner et al., 2015).

The correlation between the perception on the training they are given, knowledge on open classrooms and developing capabilities has been positive in our research. Therefore, the more adequate the training, the higher the possibilities are of implementing planning and syllabus adaptations responding to the needs of PEGS (European Agency, 2011; Leiva, 2012; Rodríguez, 2019). In this respect, attention must be brought to generating positive attitudes towards the development of inclusive education in teacher training programmes. Indeed, positive attitudes towards inclusion lead to more inclusive educational practices if we consider the perceptions that teachers have (Bawa et al., 2020; Savolainen et al., 2012; Woodcock and Faith, 2021; Yada and Savolainen, 2017).

We can conclude this study by highlighting the evident lack of initial training by the participating teachers to cater to PEGS needs, although this is less in the case of teachers who are specifically trained on diversity (TP and HS). This same argument is put forward in the study by Desombre et al., (2019) shedding light on the fact that specialist diversity

teachers have more positive attitudes towards inclusion, whilst at the same time implementing more inclusive teaching practices compared to their colleagues with more general training.

Likewise, there are statistically significant differences in the initial training given depending on the variables: dedication, ownership of the schools, professional profile associated with diversity and professional experience at the centre.

It is likewise worth mentioning the ability that teachers state they lack in order to meet the educational needs of PEGS. In this respect, emphasis is placed on the ineffectiveness of ongoing training to update teachers' knowledge, which is more significant in the case of non-specialist teaching staff with more years of experience.

In general terms, teachers claim that they are aware of open classrooms but specific knowledge is limited to the teachers and other professionals who work in them. An example of this can be found with the reference classroom tutors, who claim to have little knowledge on or links to these classrooms. We therefore believe that teacher training is essential and is a lever for change and improvement if we want to improve the response to meeting the educational needs of pupils in open classrooms in inclusive contexts.

This paper could not be ended without pointing out its limitations. The data presented in this paper could be backed up with qualitative data such as interviews or focal groups, conducted with teachers and other professionals. Likewise, we could have taken other parties into account (families, pupils, guidance services) who participate in open classrooms. These limitations invite us to conduct new studies to delve further into the tackled subject, which would contribute to guaranteeing a more inclusive, equitable response for PEGS.

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The teaching profession with a 21st Century perspective. Models of access to the profession, professional development and interactions

La profesión docente en la perspectiva del siglo XXI. Modelos de acceso a la profesión, desarrollo profesional e interacciones

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Abstract

As never before, the accelerated evolution of the social and economic context has increased the expectations of developed countries regarding their education and training systems. This paper firstly aims to briefly describe the perspective of education in the 21st Century, along with its impact on the generation of challenges facing the teaching profession. The broad international consensus on the importance of teacher-centred policies justifies the second objective of this essay: to carry out a comparative analysis of two types of models of access to the teaching profession, the delegation models and the cooperation models. This conceptualisation is based on the different role attributed to the State in the exercise of its constitutional powers. The first category comprises the current Spanish model and other evolved forms thereof, while the second corresponds to a new model that is inspired by the health system and the procedure of access to the specialised medical profession (Spanish acronym: MIR). The third objective is to highlight the role of professional development - and its articulation through a Career Plan - as the second pillar of policies focused on teachers. The arguments made highlight the comparative advantages of the cooperation model over the delegation model. These advantages are consolidated when, together with the first pillar, the second and the interactions between the two are introduced into

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the reasoning. The above arguments point to one of the priority paths for the improvement of the Spanish education system in the next decade.

Keywords: Teaching profession. Access models. Career. Systemic policies. Context analysis.

Resumen

La evolución acelerada del contexto social y económico ha incrementado, como nunca antes, las expectativas de los países desarrollados con respecto a sus sistemas de educación y formación. El presente trabajo se propone, en primer lugar, describir someramente la perspectiva de la educación en el siglo XXI y su impacto sobre la generación de desafíos para la profesión docente. El amplio consenso internacional sobre la importancia de las políticas centradas en el profesorado justifica el segundo objetivo de este ensayo: efectuar un análisis comparado de dos tipos de modelos de acceso a la profesión docente, los modelos por delegación y los modelos por cooperación. Esta conceptualización reposa en el diferente papel que se atribuya al Estado en el ejercicio de sus competencias constitucionales. La primera categoría comprende el modelo español actual y otras formas evolucionadas del mismo, mientras que la segunda corresponde a un modelo de nueva planta que se inspira en el sistema sanitario y en el procedimiento de acceso a la profesión médica especializada (MIR[1]). El tercer objetivo estriba en subrayar el papel del desarrollo profesional -y su articulación mediante un *Plan de carrera*- como segundo pilar de las políticas centradas en el profesorado. Las argumentaciones efectuadas destacan las ventajas comparativas del modelo por cooperación frente al modelo por delegación. Estas ventajas se consolidan cuando, junto con el primer pilar, se introducen en los razonamientos el segundo y, además, las interacciones entre ambos. Los argumentos expuestos señalan uno de los caminos prioritarios para la mejora, en la próxima década, del sistema educativo español.

Palabras clave: Profesión docente. Modelos de acceso. Carrera profesional. Políticas sistémicas. Análisis del contexto

Introduction

As never before, the rapid evolution of the social and economic context, experienced particularly over the past three decades, has raised the expectations of countries with regard to their education and training

(1) Acrónimo de Médico Interno Residente

systems. Governments, multilateral organisations, business organisations, foundations and academics in the economic area (UNESCO, 2004; Hanusek and Woessmann, 2007; CERI-OECD, 2007; BIAC, 2016; CEOE, 2017; OECD, 2018 a); Schleicher, 2018; EU, 2019) stressed the critical importance of improving the quality of education and its outcomes for economic development and social progress.

Two powerful vectors of change have contributed to this rapid transformation of the context. On the one hand, modern globalisation with a rapid spread of information and influence between remote environments, and exceptional mobility of people, capital and goods (Pinker, 2018); this has made the world a smaller place, while making it more interdependent. And, on the other, a technological revolution, with a growing degree of integration (Schwab, 2016), which has the digital revolution in its very core.

However, the interaction between these two phenomena, which have been reinforcing each other throughout this century (López Rupérez, 2003), has also substantively contributed, to this large-scale disruptive change that has been characterised as a "mutation of civilization" (López Rupérez, 2001).

Each of these processes of rapid transformation, on the historical time scale, has had an impact on the conception of education. These consequences have been particularly cemented in a definition of the curriculum for the 21st Century, based on the so-called "competence approach". This is an integrated approach that, according to the vision of the OECD, 2002, and the European Union (D.O.U.E., 2006; 2018), concerns knowledge, skills, attitudes and values (López Rupérez, 2020). The technological revolution has impacted expectations about cognitive and metacognitive knowledge and skills that the school is expected to transmit to new generations of students. While globalisation has stressed the need for the development of attitudes and values of pluralism and tolerance (Sartori, 2001) that "learning to live together" calls for (Delors et al. 1996). With both having reinforced the importance of these competences for personal development that have implications for work life and civic and social life.

As Tedesco (1995) pointed out:

"Modern enterprises appear as a paradigm of functioning based on the full development of the best human capacities. We would be facing an unprecedented historical circumstance, where the capacities

for performance in the productive process would be the same that are required for the role of the citizen and for personal development. (...) In the new production models, there is both the possibility and the need to put into play the same skills that are required at personal and social levels" (pp. 62-63).

In this context, education systems need to increase the degree of success of their policies, that is, their level of effectiveness, efficiency and equity (López Rupérez et al., 2018). It is worth highlighting four characteristic features of effective educational policies from the point of view of their average results and from the equity in their distribution: they should be evidence-based; they should be based on a good definition of priorities; have to benefit from a systemic approach; and have to be massive (López Rupérez, 2001).

Teacher-centred policies are a type of public policy that can and should meet these four requirements for effective educational policies. There is a broad consensus, based on evidence, in the sense that it is the quality of the teaching staff that explains, to a greater extent, the results of the students (Hattie, 2003; OECD, 2005; McKinsey & Co., 2007; States et al., 2012). This robust consistency[2] is aligned with the Pareto´ principle (Koch, 1998) -or *universal law of priorities*- to make this factor the priority object of a rational choice of educational policies (López Rupérez, 2014).

Furthermore, teacher-centred policies recognise and require a systemic approach so that they can reinforce each other, and produce virtuous circles that shorten the time needed to generate positive results and increase their degree of effectiveness (Darling-Hammond, 2017). Such an approach has been successfully adopted by the world's most successful education systems (Darling-Hammond and Rothman, 2011; Darling-Hammond, 2017).

Finally, the "massive" character of this type of policy -that is, its scalability- constitutes a characteristic inherent in the central and ubiquitous role of the teacher in the teaching and learning processes, that, within the formal systems, reaches each school, each classroom and each student.

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(2) See, for example, The Wing Institute's comprehensive review: https://www.winginstitute.org/quality-teachers-overview-all-research

In keeping with this picture, this paper aims to deepen the conceptualisation of two key groups of teacher-centred policies: policies for access to the teaching profession and policies for professional development. In addition, and following a systemic approach, the interactions between these two basic pillars of a modern and robust conception of the profession will be analysed. To this end, some of the contextual features of the teaching profession will be described in the perspective of an education for the 21st Century. Secondly, two different types of access models will be analysed and their advantages and disadvantages identified in comparative terms. Thirdly, this second basic pillar, professional development, will be considered in a broad sense and the *Career Plan* will be used as an effective tool for articulating professional development in education. Fourthly, the potential associated with interactions between and within the two pillars will be analysed, while some of the organisational demands of their implementation will be described. Finally, a section of conclusions will conclude this short essay.

The perspective of education in the 21st Century and the challenges facing the teaching profession

Over the past three decades, the challenges of the teaching profession have progressively increased. In addition to the decline in social respect for the role of teachers and their impact on the climate of discipline in the classroom, there has been a marked increase in multiculturalism in schools, accompanied by a trend towards the universalisation of pre-university education.

To this are added the growing expectations of the economy and society with respect to the results of education, as well as the new demands on the effective use of digital technologies in the classroom, to shape a set of aspects that clearly denotes the complication of teaching as a professional activity.

Along with the above, other contextual factors have accumulated throughout this century to configure teaching as a difficult profession. Some of them will be considered synthetically below.

The proliferation of VUCA contexts

One of the characteristics of modern societies in the 21st Century is the progressive increase in their level of complexity, which means more than mere complication. According to Edgar Morin (1990): "(...) complexity does not only include the quantity of units and interactions that challenge our possibilities of calculation; it also involves uncertainties, indeterminations, random phenomena" (p.48). This *complexity*, in which causality closes, time opens and a new dialogue is established between the whole and the parts (López Rupérez, 2001), is accompanied by *volatility*, or speed of change; *uncertainty*, or unpredictability and openness to the unexpected; and of *ambiguity* or a diffuse situation that allows different interpretations or that produces, before the same actions, different results.

A reality of this nature has given rise to the notion of "VUCA", which is the acronym defined by the initials of these four attributes that characterise it. Although this concept was introduced into the US military at the end of the Cold War (Shambach, 2004), it is currently applicable in the fields of strategic thinking and leadership in organisations, in order to prepare its decision makers to adapt to these new contextual conditions (Bennet and Lemoine, 2014) which are a by-product of the complexity itself.

Education, as a social subsystem, is directly or indirectly affected by this complex scenario (López Rupérez, 1997; OECD, 2016), so the relevance of the VUCA approach has been invoked by foundations, non-profit organisations and international organisations (Fadel et al., 2015; OECD 2018a; Berkowitz and Miller, 2018) as part of the vision to be shared by the main educational actors.

The competences-based approach to the curriculum

The competence-based curriculum approach is considered, according to international consensus, as required by an education for the 21st Century (López Rupérez, 2020). This new approach, which emerges decisively with the beginning of this century, complicates teaching for many reasons. First, by formally introducing metacognitive skills, that is, the skills to handle knowledge as experts do. Among them, "learning to learn" has become part of almost all international reference frameworks.

Consequently, expectations about the level of intellectual demand for curriculum content have increased, due not only to its own cognitive hierarchy, but also as a side effect of its explicit formulation and the interest in assessing its level of achievement.

Second, other competences in the civic and social spheres, which have traditionally been part of the aims of the school, have been identified as constructs and, after a major analytical effort, its characterisation has been sought in order to facilitate its evaluation in school settings (Lamb et al., 2017). As we have noticed elsewhere (López Rupérez, 2020):

"This change is substantive because, considering such competences and skills as objects of evaluation, it is as if the responsibility for their achievement were subtly transferred to the school alone. Neither the families, nor the churches, nor the media, nor any other agents operating in the social space will be subjected to an objective evaluation of their results in terms of socialisation" (p.83).

Third, emotional competence has made its way into the school curriculum, supported by advances in cognitive sciences on the role of emotions in rationality (Damàsio, 2011) so that, as Haidt (2019) has summarised, it is considered that "The head cannot even do its things without the heart" (p. 65). But, in addition, important empirical evidence has been accumulated, on the one hand, on the impact of emotional skills or abilities on multiple aspects of individuals' lives, which affect their levels of prosperity, health and even happiness (OECD, 2015; 2018 c; Chernyshenko et al., 2018); and, on the other, on how the development of emotional competences can facilitate advances in the field of cognitive competences and vice versa (Cunha and Heckman, 2007; Cunha et al. 2010). In the face of such evidence, teachers' concern for this type of competence becomes a requirement of their professional ethics.

The competence profile of teachers and a robust conception of the teaching profession

In keeping with an international movement that has been paying special attention to teacher-centred policies as a tool for improving education systems (López Rupérez, 2014; Prats, 2016; Egido Gálvez, 2020), the European Commission, in its document *Common European Principles for Teacher Competences and Qualifications* (European Commission, 2005),

has identified a broad collection of key competences of 21st Century teachers and articulated it around three strategic axes: Working with others, Working with information, knowledge and technologies, Working with and in society. When the enumeration of these required skills, in which each of these three axes is deployed, is reviewed in detail, one notices the level of professional requirement that, as a whole, they entail and that appeals, in a tacit way, to the need to form a robust profession.

Perhaps the definition of profession adopted by the Australian Council of Professions, 2004, provides the most comprehensive concept of a robust profession:

"A profession is a disciplined group of individuals who adhere to ethical standards and who hold themselves out, and are accepted by the public, as possessing special knowledge and skills in a widely recognised body of learning derived from research, education and training at a high level, and who are prepared to apply this knowledge and exercise these skills in the interest of others" (p.1).

This conception - which should, in the author's opinion, be a source of inspiration when designing and implementing policies focused on teachers - underlies the ideas that, on access to the profession, professional development and the enhancement of their interactions will be defended below.

Models of access to the teaching profession

The teaching profession forms part of the so-called "regulated professions" in Spain. According to González Cueto (2007):

"(...) regulated professions are those in respect of which a rule regulates their professional competence, that is to say, *ex lege* there is a set of functions which can only be carried out exclusively by a professional who is guaranteed either by an academic qualification, the passing of requirements and an aptitude test involving the granting or administrative authorisation of access to a profession" (p. 2).

These guarantees established for this type of profession derive from the fact that their exercise affects fundamental rights, or constitutionally relevant assets, and, for that reason, it is the State alone that is competent to grant such authorisation and to establish its conditions by legal means.

The teaching profession, particularly in schools, is legally included in the category of regulated professions, as has been established, inter alia, by Royal Decree 1665/1991 of 25 October. Education is part of the set of fundamental rights especially protected in the Spanish Constitution of 1978. The fact that its regulation is located within Title I -in Article 27, Section 1, of the Second Chapter-, confers on it a high legal status; or, using the terminology of García de Enterrías and Fernández Rodríguez (1981), places it in the "supreme constitutional rank".

The well-known link between the quality of education and the quality of teachers affects the exercise of the right to education enshrined in the aforementioned article 27 of the Spanish Constitution. This obvious circumstance has led the Constitutional Court itself (2013) to establish doctrine regarding the role of the State in relation to the selection of teachers, postulating "a common and uniform treatment regarding the conditions of access in an aspect of such importance for the educational system such as the selection of teachers" (p.21). This positioning, by its very content and nature, is transposable to the procedures for access to the teaching profession that we will analyse below.

With this perspective in mind, the models of access to the teaching profession can be classified into two types: the *models by delegation* and the *models by cooperation*, depending on the role adopted by the State, the university, or both.

Models by delegation

We understand by models of access to the teaching profession by delegation those in which the State, through a specific regulation, delegates to other institutions that exclusive competence. This is the current case in Spain, where for access to the teaching profession - by the way of both Teacher, and Teacher of Secondary Education - the State has laid down the conditions under which the curricula of those official university degrees which enable the profession to be exercised, in its various forms, must be adapted; and has delegated its implementation to the university institution. To this end, it has used different enabling formulas, depending on the educational stage: in the case of Early Childhood Education and Primary Education, through the simple attainment of the title of Teacher (BOE, 2007 a and b); and, in the case of

Secondary Education, by means of the corresponding academic title and, in addition, the Secondary Master's degree (BOE, 2007 c).

Different critical analyses on the development of this model - carried out most of the time from the university itself (Manso Ayuso, 2012; Conferencia de Decanos/as de Educación, 2017a) - have led the Conference of Deans of Education to propose a comprehensive set of actions which substantially improve the model in aspects relating to its implementation (Conferencia de Decanos/as de Educación, 2017b) and, to some extent, its conception, but they do not change its essential core, that is, the delegation of the constitutional powers of the State to the university institution, in terms of access to the teaching profession.

This configuration of the model reminds us of the thesis of the evolution of scientific theories within a research program, according to the review of Popperian falsifiability carried out by Imre Lakatos. According to Lakatos (1983), these theories, in their process of adaptation to the demands of reality, share a firm core that is accompanied by a protective belt, or set of auxiliary hypotheses that can be modified, removed or replaced in order to prevent the possibility of the firm core being proven false. However, the model of the Conference of Deans of Education exhibits empirical weaknesses serious enough to be able to preserve intact the validity of its firm core.

First, there is no guarantee that the root causes that led to the degradation of the previous model - some of which are recognised in the first document (Conferencia de Decanos/as de Educación, 2017a) - will cease to operate under the new model, they derive from university autonomy itself. This is a constitutional prerogative which, by its very nature, does not allow the delegation of responsibilities by the State, in terms of access to the teaching profession, to be reconciled, with the processes of correcting errors associated with accountability mechanisms, as proven by experience and admitted by the university world: once powers are delegated to a constitutionally autonomous entity, a straightforward rectification is unlikely.

Woessmann et al. (2009), analysing on an empirical basis the balance between the benefits and risks of school autonomy as a mechanism for improvement, point out that broad autonomy without accountability can prevail, within educational institutions, "opportunistic" behaviours that turns its back on improvement processes. In this same sense, the

autonomy-accountability binomial has been established as a necessary condition for quality university governance (Hénard and Mitterle, 2008).

This certain risk suggests decoupling university autonomy from a frank delegation of responsibilities in terms of access to the teaching profession. This does not in any way compromise the autonomy of both parties to carry out their respective functions, within the legal framework established, but rather aims at cooperation between them, but within a new architecture of the model, as we will develop later.

Secondly, one of the empirically-based perverse effects of the current model, which would hardly be corrected by its evolved version, is the proliferation of different variants of the same basic model, of very different quality levels, according to the university that develops it (Manso Ayuso, 2012). This situation undermines the guarantee of equality in the right to education, which the State must ensure and which, in relation to the selection of teachers, has been invoked in the aforementioned Constitutional Court ruling (Tribunal Constitucional, 2013).

In the light of the above, and as we have pointed out elsewhere (López Rupérez, 2018a), the preservation of the model by delegation would presuppose the existence in Spain, without the citizens having known, of a sort of «constitutional mutation» understood here, following Jellinek, as produced by the non-exercise of rights and powers conferred on the State by the Constitution (Jellinek, 1991).

Models by cooperation

In this work, we understand by models of access to the teaching profession by cooperation those in which the State, through its central Government and without prejudice to the exercise of its powers recognised by the Constitution, cooperates with the university institution and with the educational administrations of the regions for the best achievement of the exercise of the right to education under conditions of equality.

As can be inferred from this conceptualisation, unlike the previous model, the cooperation that is invoked affects, in this case, its essential core and not only the relatively peripheral aspects that are questioned by the models by delegation.

The proposal to take as reference, for the rearrangement of access to the teaching profession, the model of doctors starts from 2010 when in

the monograph "The reform of school education" (López Rupérez, 2010) its author invoked inspiration from the health model for the improvement of teacher selection processes. This inspiration, which would later be described as "educational MIR[3]", accepts, as the core of the model, the basic competence of the State in organising the process, without prejudice to loyal cooperation with the education administrations of the autonomous communities and with the university institution itself (López Rupérez, 2014). The health MIR also corresponds to a model for cooperation, understood in the terms described above, which, according to the corresponding regulations, allows a «common and coordinated treatment guaranteeing the principle of equality in access to the specialist qualification, whatever the teaching unit, of the multiple accredited for training» (BOE, 2008).

In previous publications, different substantive characteristics of the MIR model, that should be transposed to the teaching field, have been described (López Rupérez, 2014; 2015; 2018b). However, at this point it is worth highlighting the areas of inter-institutional cooperation of said reference model, which are, among others, the setting of the number of places assigned to each MIR call - by specialties -, in accordance with the real needs of the National Health System, defined with the support of its Human Resources Commission in the one that the health administrations of the autonomous communities are represented; and the university nature of the hospitals where the so-called "Teaching Units" are housed, which constitute the complex health environments where specialised health training is carried out in a highly organised manner and in accordance with high quality standards, through a so-called 'residency system'.

In any case, and as has been underlined from an expert evaluation of the internationally recognised Singapore model (Reimers and O'Donell, 2016), it should be noted that:

"Selection into the teaching profession is key. Admission into teacher preparation programs is highly competitive. Being highly selective appears to be one of the elements that has made teaching such a valued profession, and, according to the educators we met, one of the factors that explains the recent success of the education system in Singapore" (p. 50).

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(3) MIR is the Spanish acronym for Resident Internal Physician which is a complete postgraduate system for access to the specialised medical profession.

This is also one of the keys recognised in Spain for the proven success of the health MIR

The model of access to the teaching profession that is advocated involves the creation of a national network of *Institutos Superiores de Formación del Profesorado* (ISFP) (Higher Institutes of Teacher Training) (Nasarre and López Rupérez, 2011) that would constitute key institutions of the new model. In addition to the training functions for candidates for teaching in schools, these vocational postgraduate training centres would be responsible for (1) accrediting schools, where the induction activities are to be carried out; (2) the accreditation of the relevant training tutors, responsible for the accompaniment of the candidates, and the periodic evaluation of their training practice; (3) the integration and coordination of the different components the training system for access to the teaching profession. Although tributaries of the predecessors to the current *Instituts Nationaux Supérieurs du Professorat et de l'Éducation* (INSPE) (Alonso-Sainz, T. and Thoilliez, B., 2019), the ISFP differ from their French counterparts, among other features, by the wider integration of inter-institutional collaboration that they entail.

It is necessary to underline here the cooperation component of this essential part of the model, which would benefit from a formula of tripartite agreement between the Ministry of Education, the Education Administrations of the Autonomous Communities and the Universities, in accordance with an equivalent scheme and content throughout the national territory. According to this model for cooperation, the necessary theoretical and research component of the training of candidates for teachers or secondary teachers, whose effects on the performance of educational institutions are recognised (Brown and Zhang, 2017), concerns, of course, the university institution. In the same way the component linked to expert professional knowledge corresponds to teachers experienced and with demonstrated capacity for conceptualisation. And necessarily implies the competent education administrations which are largely responsible for these key human resources. The same applies in this case to schools accredited for the development of the induction phase.

This integrated model of multi-stakeholder cooperation, in addition to being scrupulously respectful of each area of competence, would guarantee the quality of the training model through management systems, rigorous procedures for the selection of teachers and continuous

mechanisms for quality control and accountability of the Higher Institutes of Teacher Training (ISFP) themselves. These conditions would be formally established in this collaboration agreement. This modification in the model architecture would avoid the unintended degradation effects associated with the current model by delegation, and facilitate its optimal integration.

Another feature highlighted by the expert evaluation conducted on the Singapore system (Reimers and O Donell, 2016), which relates to the model by cooperation, is the following:

"One gets the impression that in Singapore, the institutions of education are a veritable system of interlocking components, where the various elements of the system are synchronised with each other. This is greatly facilitated by the clear and concise nature of the goals that guide the system, and by the effective communication strategies which are deployed to ensure that all key stakeholders understand in what way their practice should align with those goals" (p.113).

In the same vein, but referring to the specific case of the Teachers´ *Practicum*, the need to achieve greater coordination between the teacher training institutions and the tutors of the practice in schools has been invoked in Spain on empirical bases, by Egido Gálvez and López Martín (2016), in agreement with some other authors who have come to precisely identify the disconnection between what is taught in universities and the experience of practices as the true "Achilles heel" of initial teacher training.

Career development and access models

Professional development, understood as a process of continuous improvement of knowledge and teaching skills, has a certain influence on the results of students and is favoured by an articulation of their stages, of its component elements and its determinants factors, in a flexible professional career but organised through a *Career Plan*. As we have described elsewhere (López Rupérez, 1994), the Career Plan is, in essence, a personalised forecast of professional development in which training, incentives, evaluation, and promotion are integrated, from a systemic approach, into a coherent whole.

According to comparative analyses carried out by different international experts, one of the aspects that are shared by high-performance education systems is the importance they attach to the professional development of their teachers (Darling-Hammond and Rothman, 2011). In particular, Singapore (National Institute of Education, 2009; Darling-Hammond and Rothman, 2011; Reimers and O'Donell, 2016; Jensen et al., 2016; Darling-Hammond, 2017) had in the previous decade, already launched the conception of the Career Plan similar to the one previously proposed in Spain in the preceding decade[4] (López Rupérez, 1994), which served as the basis, at the beginning of this century, in the unfinished works carried out in the framework of the *Sectorial Conference of Education*[5], and oriented to normatively articulate a professional teaching career.

Darling-Hammond and Rothman (2011), referring to the case of Singapore, summarise the following:

"Depending on their own abilities and career goals, teachers can remain in the classroom and become lead and master teachers; they can take on specialist roles, such as curriculum specialist or guidance counsellor; or they can take the leadership route and become administrators. The Ministry of Education is constantly looking for ways to recognise and promote teacher leadership, both for individuals who have demonstrated various talents and for teachers as a whole" (p. 7).

Models by cooperation and professional development

One of the key elements present in the health MIR - reference of the models by cooperation for the access to the teaching profession - is what it has of mechanism of transfer of professional knowledge from one generation to the next. But one of the frequent problems in the field of education is the absence of a well-founded and well-organised expert knowledge base, which provides similar solutions to common problems and has basic protocols of action for similar situations. In other words, it is not transferable.

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(4) See Figure 5, p. 19 in Jensen et al., 2016 and compare Figure 9, p.137 in López Rupérez, 1994

(5) Executive body composed of the Ministry of Education and the educational administrations of the Autonomous Communities

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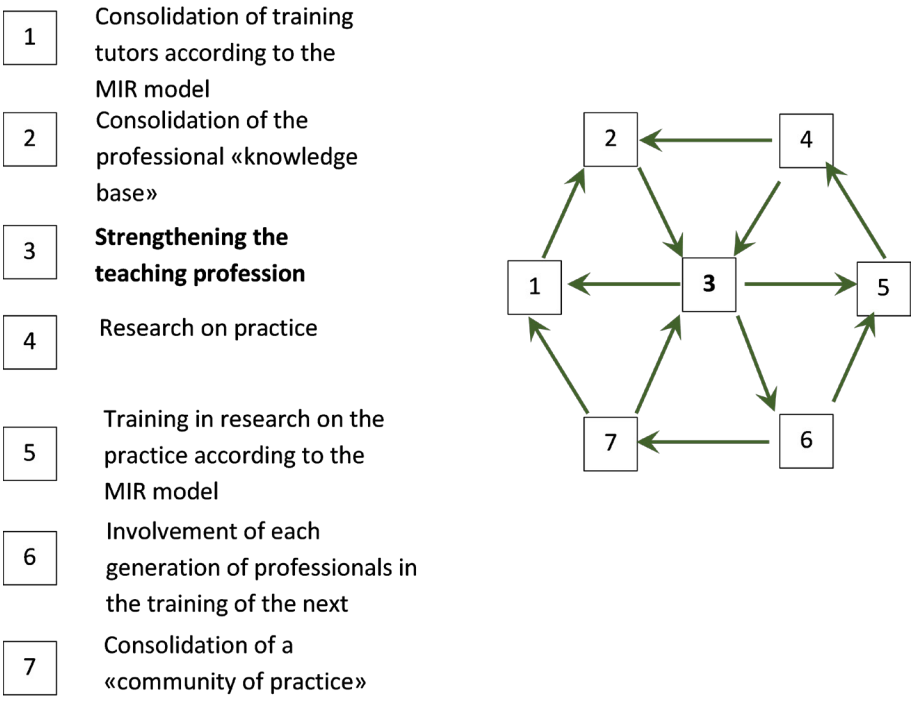
Professional knowledge has, in any case, a knowledge component based on experience that will be all the more diffuse as the less evolved the corresponding profession is. This type of expert knowledge is often tacit. But this tacit knowledge can be organised and made explicit if competent professionals are faced with the obligation to teach it.

FIGURE I. A model of interactions between the professional strengthening and a MIR type access system to the teaching profession



Source: Author.

Accordingly, the progressive consolidation of the so-called "educational MIR", as a tool for the professional preparation of new generations of teachers, necessarily requires a stable and predictable structure for professional development, so that the organisation and foundation of

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such professional knowledge can be promoted. Even in less elaborate models of access to the teaching profession, such as the one postulated by the Conference of Deans of Education (Conferencia de Decanos/as de Educación, 2017b), the configuration of a professional knowledge base - which is essential particularly in the induction phase - should be supported by a robust conception of professional development that provides for continuous and intentional preparation for that function.

An analysis of interactions

Along with the professional growth of the teacher, the professional development mechanisms also aim at strengthening the profession, strengthening which rests in particular on two decisive supports: the consolidation of an expert knowledge base and the consolidation of a community of practice or human group whose members share an activity or set of activities of their own that links them to each other and to the group (Hargreaves, 2000). Figure I outlines the set of interactions that link the access model and professional development and strengthening (López Rupérez, 2015). Thus, the consolidation of the training tutors according to the MIR model (1), through the incorporation of this function into the career plan, will contribute, through the mechanisms described above, to a consolidation of the professional knowledge base (2), which will contribute to the strengthening of the profession (3), which in turn will strengthen the preparation of training tutors. On the other hand, the involvement of each generation of professionals in the training of the next (6) will allow, on the one hand, the transfer of research competences on the practice (5) and, on the other, the consolidation of the community of practice (7); and this consolidation will strengthen the teaching profession (3) and enhance professional development, while consolidating the training system for access to the profession (1). On the other hand, the training on practice research, which the MIR model envisages (5), will facilitate research on practice in the professional practice (4), which in turn will contribute to the consolidation of the professional knowledge base (2) and the strengthening of the profession (3), which will reinforce the training model, and will continue on a cyclical basis.

There is thus a complex network of interactions that defines a set of virtuous circles that, by operating in an integrated manner, will accelerate

the processes of change by making the consolidation of the training model for access to the profession possible in less time.

The organisational demands of a complex model

The modelling carried out in figure I points to an organised coupling between the MIR system of access to the teaching profession and the professional development model that is designed, among other things, to achieve maximum operability and consistency of the access system. This points to the need for an integrated organisational system in which the responsible institutions share the same overall project and vision. The design of a model for the professional development of teachers in the public sector, through the instrument of the Career Plan, for example, concerns, in terms of its basic conception, the Ministry of Education, consulted the Sectoral Conference on Education, since the teaching bodies in Spain have a State character; while its implementation is the responsibility of the educational administrations of the autonomous communities.

Therefore, these are related areas that affect the solidity and effectiveness of the access model and in which however the university institution lacks competences. For this reason, the model by delegation would be separated from a pillar on which its degree of success and long-term sustainability depends to a large extent.

On the basis of the above, another of the comparative advantages of cooperation models compared to delegation models is only estimated. This coupling between access models and professional development models, as well as those of the corresponding responsible institutions, makes the set more robust and, particularly, provides greater solidity to the model of access to the teaching profession inspired by the health MIR in comparative terms.

Conclusions

The changing context of education in the 21st Century poses serious challenges for teachers, which can only be addressed with some

guarantees of success, by developing new teacher-centred policies aimed at strengthening the teaching profession

With regard to the two types of models of access to the profession that have been described in this paper - models by delegation and models by cooperation - when they are analysed comparatively, the advantages of the latter compared to those of the former are stand out, in order to consolidate a system of rigorous, consistent and sustainable access over time, which operates on the causes of the errors of the previous model and involves all the institutions concerned - central government, educational administrations and universities - in a framework of solid, loyal and respectful collaboration at the competence level.

But, moreover, when, together with access to the teaching profession, as a pillar of teacher-cantered policies, the key piece of professional development is introduced into the analyses as a second basic pillar, through the Career Plan, and the reinforcing interactions between them are underlined, the relevance of the model by cooperation is clearly consolidated, by integrating into the same framework of inter-institutional cooperation all the relevant stakeholders which, otherwise, they would appear scattered in their specific responsibilities.

Another development scheme of the educational MIR - Resident Internal Teacher (Spanish acronym: DIR) - has been described in the literature (Valle and Manso, 2018). It is a model, furthermore, that revalues schools as main actors in professional training. However, by not altering the core of the current model, it sets aside the question of broad, frank and regulated inter-institutional cooperation between the State, the education administrations of the regions and the university institution. For this reason, it suffers from a systemic deficiency or a lack of integration of the main policies focused on teachers, thus dispensing with their recognised benefits.

In his defence of the systemic approach, Darling-Hammond (2017), based on an international comparative analysis of high-performance educational systems, notes the following:

«In every case, these systems include multiple, coherent and complementary components associated with recruiting, developing, and retaining talented individuals to support the overall goal of ensuring that each school is populated by effective teachers» (p.294).

The coupling between the different parts, within a systemic scheme, makes the whole more robust and therefore makes significant

strengthening of the teaching profession viable in the medium term. In accordance with the results of the evaluation of different experts on high-performing countries, this is possible; which points the way to the improvement of the Spanish education system and guides the establishment of its unavoidable priorities for education policy in the following decade.

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Application of Importance and Performance Analysis to teacher competencies for the identification of training priorities

Aplicación de un análisis de importancia y realización de competencias para la identificación de prioridades en la formación docente

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Abstract

Quality education for all requires competent teachers. An analysis of the functions that teachers must perform leads to a profile of teaching competences. By ascertaining teachers' perception of the importance of these competencies, and how well they are actually achieved in practice, we can identify strengths and areas for improvement, to be considered in the design of in-service teacher training.

In order to accomplish this objective, this study analyses the view of 559 teachers of Primary and Compulsory Secondary Education, through the self-application of a teaching competencies assessment scale for compulsory education teachers (Martínez-Izaguirre, Yániz-Alvarez-de-Eulate & Villardón-Gallego, 2018).

The results show that teachers recognize the importance of the teacher profile competencies, especially primary school teachers, who also apply them to a greater extent than do secondary school teachers. Analysis of the discrepancy between the importance and the implementation of the competencies shows that development of the Competency in Learning, research and innovation,

followed by the Competency in Instruction Planning and Management and the Competency in Guidance are the priority areas to be considered in training.

Key words: teacher competencies, professional development, self-assessment, importance-performance analysis, teacher education.

Resumen

Una educación de calidad para todas y todos requiere un profesorado competente. Un análisis de las funciones que tienen que desarrollar deriva en un perfil de competencias docentes. Conocer la percepción del profesorado sobre la relevancia de dichas competencias y sobre su nivel de realización en la práctica permite identificar puntos fuertes y áreas de mejora, a considerar en la planificación de la formación permanente del profesorado.

Con el fin de lograr este objetivo, en este estudio se analiza la visión de 559 profesores de Educación Primaria y Educación Secundaria Obligatoria, a través de la auto-aplicación de la Escala de evaluación de Competencias Docentes del Profesorado de Educación Obligatoria (Martínez-Izaguirre, Yániz-Alvarez-de-Eulate y Villardón-Gallego, 2018).

Los resultados muestran que el profesorado reconoce la importancia de las competencias del perfil docente, sobre todo en el profesorado de Educación Primaria, quien, a su vez, las aplica en mayor medida que el profesorado de Educación Secundaria. El análisis de la discrepancia entre la importancia y la realización de las competencias refleja como áreas prioritarias a considerar en la formación el desarrollo de la Competencia para el Aprendizaje y para la Investigación y la Innovación, seguida de la Competencia para la Planificación y Gestión educativa y de la Competencia para la Tutoría y la Orientación.

Palabras clave: competencias docentes, desarrollo profesional, autoevaluación, análisis importancia-realización, formación docente.

Introduction

Many studies emphasize the importance of the teacher in inclusive, quality education (Darling-Hammond, 2008; Fullan, 2002; Imbernón, 2020; Rodríguez-Gómez, Armengol & Meneses, 2017). Competent teachers are fundamental (Imbernón, 2020); this points to the importance of effective, evidence-based teacher training (Goldhaber, 2018).

Considering the functions that teachers are to fulfill, Martínez-Izaguirre, Yániz-Álvarez de Eulate and Villardón-Gallego (2017) identified two types of teaching competencies: key competencies, pertaining to the task of teaching; and generic-transversal competencies, which contribute to the attainment of educational purposes. The key competencies are: a) Instruction planning and management; b) Curriculum management and implementation; c) Educational assessment; d) Guidance. The generic-transversal competencies are: e) Learning, research and innovation; f) Ethics and professional commitment; g) Teaching coordination and teamwork with the educational community; h) Emotional management and building environments of trust; i) Communication with the educational community.

Traditionally, the preparation of teachers has focused on their execution of the typical functions of the profession (Van Der Schaaf, Slof, Boven & De Jong, 2019), so we expect teachers to be more knowledgeable and qualified in these key competencies. The generic-transversal competencies, however, were more recently incorporated in the teacher profile (Iranzo-García et al., 2020), and in teacher training (Amor Almedina & Serrano Rodríguez, 2018; Imbernón, 2020). For this reason, they may not be as highly valued or implemented by teachers (Maaranen, & Stenberg, 2020). Even if teachers do recognize their importance, they may not feel well prepared to apply these competencies (Stenberg & Maaranen, 2020).

Teacher training must adapt to the real needs of the teaching profession and ensure that all competencies are sufficiently developed, so that future teachers are able to effectively practice their profession (Imbernón, 2020; Zabalza, 2006).

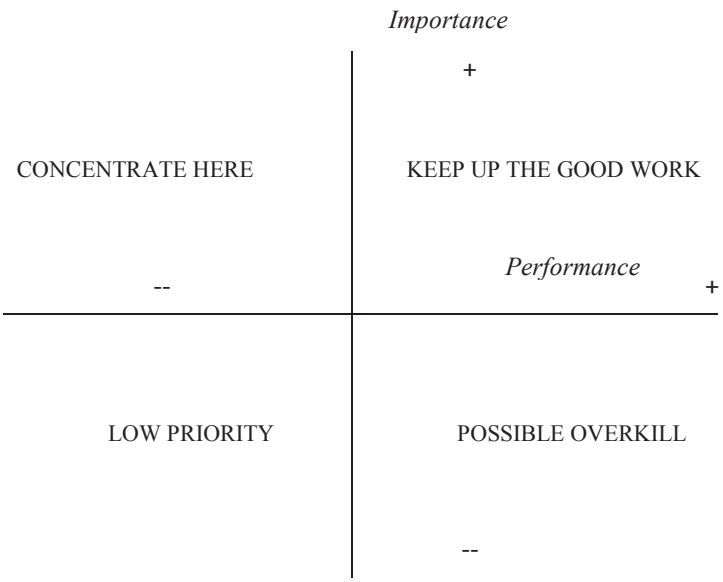
The strategies of reflection and self-assessment of teachers' experiences and needs seem to be effective for learning how well they match the competency profile that is needed in today's educational context (Körkkö, Kotilainen, Toljamo & Turunen, 2020; Martínez-Izaguire et ál., 2018). From this understanding, training can be designed that focuses on the development of teaching competencies.

By evaluating the level of importance that teachers assign to each of the teaching competencies, and their perceived level of application in educational practice (Granjo, Castro Silva & Peixoto, 2021; Maaranen & Stenberg, 2020), we are able to analyze the actual effectiveness of training programs that lead to professional teaching positions (Körkkö

et ál., 2020). We also gain information on aspects where help may be needed for facing the educational challenges of classroom practice.

In this regard, the Importance-Performance Analysis (IPA) technique, designed by Marilla and James in 1977, can show us the relationship between the importance that teachers assign to teaching competencies, and their perceived level of application in practice, that is, their self-efficacy. The technique offers a graphic representation of the results, facilitating the identification of areas for improvement in practice, making it an effective tool for educational improvement (Kitcharoen, 2004). It reveals not only the competencies with highest developmental priority, due to their high importance and low application, but also certain competencies where the existing effort should be maintained, as well as competencies where the existing effort is greater than what is actually needed. In this way, by placing the teaching competencies into different quadrants (See Figure 1), we can identify the training needs of teachers.

FIGURE 1. Visual representation of Importance-Performance Analysis.



Source: Taken from Martilla and James (1977).

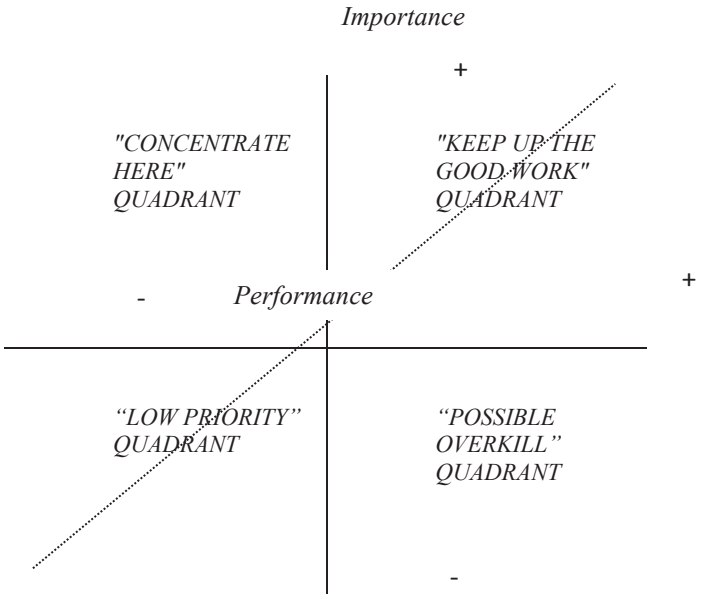
The coordinate axes enable us to place study variables in four quadrants, according to participants' scores:

- *"Concentrate Here"*: There is a mismatch between the importance assigned to the objectives and the effort applied for meeting them. Greater investment of effort and resources is required.
- *"Keep up the good work"*: There is a balance between importance and performance. This quadrant justifies maintaining the effort and resources that are applied.
- *"Low Priority"*: Here we find objectives that are not considered important, and consequently, low effort is applied.
- *"Possible Overkill":* Excessive effort is being applied to these objectives, in comparison to the low importance they are assigned. It would be advisable to reduce efforts and resources dedicated to these aspects, that they might be invested in other objectives, for example, those found in the "Concentrate Here" quadrant.

Several different methods of information analysis have grown out of this model (Ábalo, Varela & Rial, 2006; Huan & Beaman, 2005). When scores fall in mid-range values, variables tend to concentrate in the "keep up the good work" quandrant, making it hard to reach any conclusions about improving. To compensate for this, diagonal models (Ábalo et ál., 2006) have proposed placing the axis intersection at the mean value obtained from all the importance and performance scores.

Sethna (1982) and Novatorov (1992), for their part, stress analyzing the discrepancy between importance and performance of an objective. Similarly, Expectation Disconfirmation theory focuses on the mismatch between expectations regarding an objective and its reality (Ábalo et ál., 2006). According to this approach, the greater the importance assigned to a given objective and the lower its level of achievement, the greater the need for prompt action. To get a better perception of the distance between what is desired and reality, they propose a combined representation, using the quadrants and the diagonal from the diagonal models. The greater the distance between these, the greater the need to apply effort. The combined representation is also shown graphically (see Figure II).

FIGURE II. Visual representation of Importance-Performance Analysis combined with "diagonal models".



Source: Taken from Ábalo et ál. (2006).

Method

Objective

Considering the need for training to be based on the development of teacher profile competencies, the aim of this study was to ascertain through self-assessments the importance that primary and secondary teachers give to the key and transversal competencies, and their consideration of how well these competencies are applied in their own practice. Contrasting the importance they assign with their perceived performance in these competencies will identify priority areas for improvement, to be taken into account in the design of training.

Participants

Of the total 439 schools in Bizkaia, 44 (10%) participated in this study. School selection was based on ease of access, maintaining population proportions in terms of school type (charter/public) and stage of education. There were 27 schools of primary education (17 public and 10 charter) and 17 schools of compulsory secondary education (7 public and 10 charter).

In total, the teacher sample contained 559 teachers with the following characteristics:

- Gender: 73.7% women and 26.3% men.
- Age: 18.8% under age 35; 40.8% from 36 to 50 years old; 40.4% from 51 to 65.
- Stage of education: 57.5% worked in primary education, 38.9% in compulsory secondary education, and 3.6% at both levels.
- Degree held: 45.7% held a *Diplomatura* (3-year undergraduate degree), 45.8% held a *Grado* or *Licenciatura* (4- or 5-year undergraduate degree), 7.9% held a master's degree, and 0.5% held a doctorate.
- Pre-service teacher training: 58.7% had studied an undergraduate degree in primary education; 22.9% had taken the Pedagogical Adaptation Course (short course to qualify university graduates from other fields to teach in secondary schools); 1.3% had completed a master's in secondary education; and 11.1% had studied pedagogy or school psychology.
- Years of teaching experience: 19.4% had less than 10 years of experience; 21.9% between 10-20 years; 35.7% between 21-30 years; and 23% betweeen 31 and 40 years.

Procedure

Schools were contacted by telephone to inform them about the study and to request their participation. Of the schools contacted, 82% agreed to collaborate in the study. In order to complete the sample, other schools were selected that would match these in stage of education and school type (charter/public).

Once approval was obtained from the school administration, we held a face-to-face meeting with the teaching staff to inform them about the study and to request their voluntary participation. The teachers from one of the schools of compulsory secondary education declined to participate.

Two modalities were proposed for data collection: hold a staff meeting where the questionnaires would be applied in one group session, or distribute the questionnaires to the teachers for them to complete and deposit into a collection box, as a means of ensuring anonymity. Most schools chose the second option.

Instrument

Participants responded to the *Escala de Evaluación de Competencias Docentes del Profesorado de Educación Obligatoria* [teaching competency assessment for teachers of compulsory education] (Martínez-Izaguirre et ál., 2018).

The scale comprises 65 items that correspond to key and transversal competencies identified in the teaching profile: a) Instruction planning and management; b) Curriculum management and implementation; c) Educational assessment; d) Guidance; e) Learning, research and innovation; f) Ethics and professional commitment; g) Teaching coordination and teamwork with the educational community, h) Emotional management and building environments of trust; i) Communication with the educational community.

For each item, participants were to rate its importance on a scale from 1 to 5 (from Not important at all, to Very important), for the Importance Subscale, and their frequency of performing that competency also on a scale from 1 to 5 (from Not performed at all, to Very much performed), for the Performance Subscale. The instrument showed high reliability in both the Importance Subscale (Alpha=.976) and the Performance Subscale (Alpha=.964) (Martínez-Izaguirre et ál., 2018).

Data analyses

Descriptive analyses of central tendency (mean and median) and dispersion (standard deviation) were carried out to determine the degree

that teachers valued and applied the teaching competencies. Student's *t* was used to analyze differences of means of teachers in primary and in secondary education. Calculations were made using SPSS version 22.

The IPA technique offers a combined analysis of the Importance and Performance subscales to observe the level of discrepancy between participants' opinions and their actions in each of the key and transversal competences. As recommended by Ábalo et al. (2006), this study presents a combined reading of the results, based on a reading of the quadrants and the diagonals.

Results

Next, the results are presented in the following organization: relevance attributed to the teacher profile competencies, level of their application in educational practice, level of discrepancy between the levels of importance assigned and perceived application, and differences in the importance and performance according to the stage of education where the teacher carries out their work.

Relevance of the teacher profile competencies

The teachers acknowledged the importance of the teaching competencies analyzed (M=4.48; SD=.46), where the lowest rating assigned to any competency was a mean score of 4.30 (see Table I).

The competency considered to be most important was Ethics and Professional Commitment. This was immediately followed by Emotional management and building environments of trust, along with Guidance. The competencies with the lowest ratings were Instruction planning and management and Educational Assessment, despite that fact that these two competencies have the longest tradition in the teacher profile. In all competencies, the value of the median is above the mean, but near to it.

TABLE I. Teacher profile competencies in order of the importance attributed to them.

Teaching competencies ordered by importance	Mean	Standard Deviation	Median
Ethics and Professional Commitment	4.61	.40	4.75
Emotional management and building environments of trust	4.58	.44	4.67
Guidance	4.53	.47	4.63
Curriculum management and implementation	4.50	.43	4.62
Teaching coordination and teamwork with the community	4.49	.51	4.67
Learning, research and innovation	4.43	.48	4.50
Educational assessment	4.41	.49	4.50
Instruction planning and management	4.30	.53	4.40
TOTAL	4.48	.46	4.59

Source: prepared by the authors

Performance of the teaching competencies

0The mean for overall performance in teacher profile competencies was 3.88. Although the perceived level of teacher performance is acceptable, differences can be observed between competencies. The competency in Ethics and professional commitment was considered the most fully performed, while Instruction planning and management was applied the least, followed by the competency in Learning, research and innovation. The median in most competencies had values similar to the mean.

TABLE II. Teaching competencies in order by performance

Teaching competencies	Mean	Standard Deviation	Median
Ethics and professional commitment	4.27	.52	3.38
Teaching coordination and teamwork with the community	3.98	.60	4.00
Emotional management and building environments of trust	3.93	.54	4.00
Curriculum management and implementation	3.86	.54	3.86
Educational assessment	3.84	.57	3.88
Guidance	3.84	.66	3.88
Learning, research and innovation	3.70	.57	3.70
Instruction planning and management	3.60	.63	3.60
TOTAL	3.88	.57	3.78

Source: prepared by the authors

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Discrepancy between importance and performance of the proposed teacher profile

Taking into account the mean level of acceptance of the teacher profile and the level of profile performance, the overall degree of discrepancy is 0.60. Discrepancy levels between importance and performance for each competency are shown in Table III. Appendix I contains the descriptive statistics of importance and performance for each item of the competencies.

TABLE III. Teaching competencies in order by discrepancy between level of importance and level of performance

Teaching competencies	Level of discrepancy
Learning, research and innovation (C5)	0.73
Instruction planning and management (C1)	0.70
Guidance (C4)	0.68
Emotional management and building environments of trust (C8)	0.65
Curriculum management and implementation (C2)	0.64
Educational assessment (C3)	0.57
Teaching coordination and teamwork with the community (C7)	0.51
Ethics and professional commitment (C6)	0.34
TOTAL	0.60

Source: prepared by the authors

The competencies that show the greatest discrepancy between the importance attributed to them and their level of execution are Learning, research and innovation (Difference=0.73), Instruction planning and management (Difference=0.70), and Guidance (Difference=0.68), while Ethics and Professional Commitment presented the least discrepancy (Difference=0.34).

Placement of the teaching competencies into the different IPA quadrants is shown below (Chart I).

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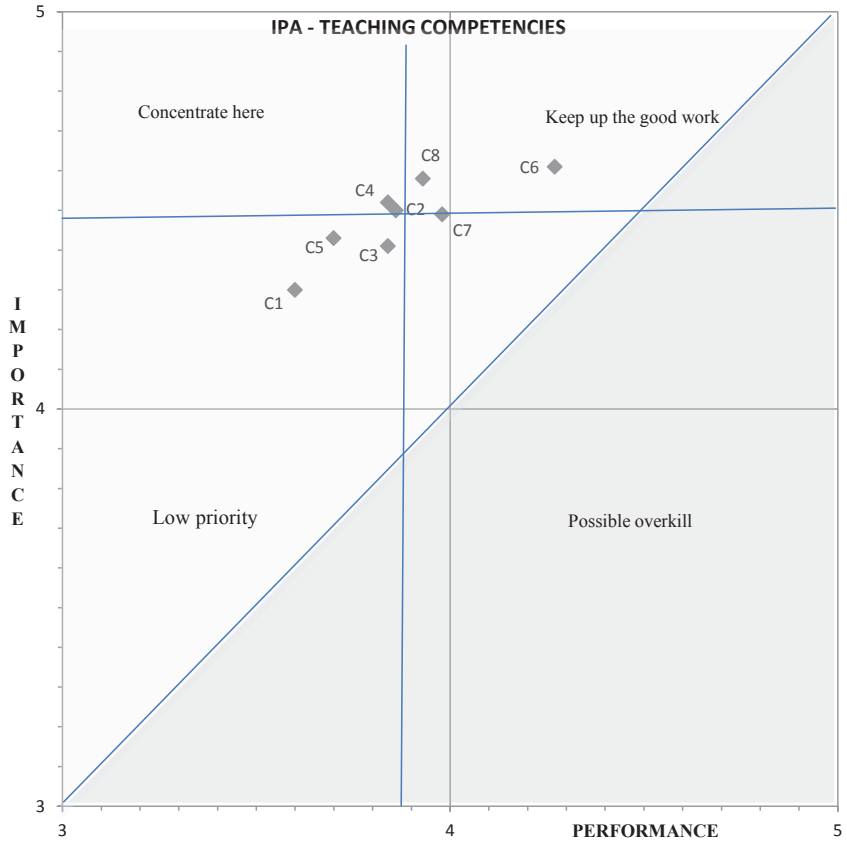
CHART I. Priority of teaching competencies to be addressed, according to their placement on the Importance-Performance axes.



C1: Competency in Instruction planning and management
C2: Competency in Curriculum management and implementation
C3: Competency in Educational assessment
C4: Competency in Guidance
C5: Competency in Learning, research and educational innovation
C6: Competency in Ethics and professional commitment
C7: Competency in Teaching coordination and teamwork
C8: Competency in Emotional management and building environments of trust
Source: prepared by the authors, adapted from Ábalo et ál., 2006

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If diagonal models are applied, all competencies fall in the "Concentrate Here" quadrant. The same situation is found using the classic interpretation of the quadrants, with the exception of Ethics and Professional Commitment (C6), which falls in the "Keep up the good work" quadrant. Even though all the competencies need further work, it is important to make a detailed analysis to differentiate which have the greatest priority.

To this end, the axes have been positioned to cross at their mean scores (Importance = 4.48; Performance = 3.88). We can now observe that the Low Priority quadrant, previously vacant, is now occupied by the competencies of Instruction planning and management (C1), Educational assessment (C3) and Learning, research and innovation (C5), being less valued and less implemented. In the "Keep up the good work" quadrant, where there is a balance between importance and performance, we find the following competencies: Ethics and professional commitment (C6), Teaching coordination and teamwork with the community (C7) and Emotional management and building environments of trust (C8). Finally, in the "Concentrate Here" quadrant, we find Curriculum management and implementation (C2) and Guidance (C4), indicating that teachers consider their performance to be much lower than the importance of these competencies and, consequently, they need to be worked on.

According to scores obtained, no competency falls into the "Possible Overkill" quadrant, that is, where performance level exceeds level of importance.

Importance and application of the teaching competencies, by stage of education

The level of importance assigned to the competencies differs according to the teacher's stage of education (p=<.05), with primary education teachers assigning higher importance to the competencies (Table IV).

TABLE IV. Comparison of means according to stage of education

			IMPORTANCE SCALE			PERFORMANCE SCALE		
Competency	**Stage**	**N**	**Mean**	***t***	**Significance**	**Mean**	***t***	**Significance**
Instruction planning and management	Primary	321	4.3745	3.841	.000*	3.6703	3.302	.001*
	Secondary	217	4.1866			3.4894		
Curriculum management and implementation	Primary	321	4.5642	4.069	.000*	3.9421	4.964	.000*
	Secondary	217	4,4064			3.7216		
Educational assessment	Primary	321	4.4620	3.183	.002*	3.8905	2.276	.023*
	Secondary	217	4.3195			3.7761		
Guidance	Primary	321	4.6135	4.883	.000*	3.9854	5.597	.000*
	Secondary	217	4.4051			3.6692		
Learning, research and innovation	Primary	320	4.4749	2.583	.010*	3.7511	2.670	.008*
	Secondary	217	4.3616			3.6167		
Ethics and professional commitment	Primary	321	4.6501	2.841	.005*	4.3134	1.896	.058
	Secondary	217	4.5450			4.2264		
Teaching coordination and teamwork with the community	Primary	321	4.5472	3.201	.001*	4.0432	3.426	.001*
	Secondary	217	4.4005			3.8649		
Emotional management and building environments of trust	Primary	321	4.6107	2.369	.018*	3.9554	1.385	.167
	Secondary	217	4.5174			3.8865		

Source: prepared by the authors
* significant values p <.05

There are also significant differences between primary and secondary education teachers in their performance level in the following competencies, where the primary education teachers produced higher scores: competency in Instruction planning and management, competency in Curriculum management and implementation, competency in Educational assessment, Competency in Guidance, competency in

Learning, research and innovation, competency in Teaching coordination and teamwork with the educational community.

No significant differences were found in the implementation of Ethics and Professional Commitment or in Emotional management and building environments of trust.

Discussion

The aim of the study was to learn teachers' opinion about the teacher profile and their level of perceived attainment. The results indicate a consensus among the participants regarding the relevance of the teacher profile competencies for addressing present-day educational needs (Martínez-Izaguirre et al., 2017).

Particularly noteworthy is the importance given to transversal competencies like Ethics and professional commitment, and Emotional management, above certain key competencies for teaching practice, like Instruction planning and management, and Educational assessment. However, the key competencies of Curriculum implementation and Guidance were considered highly important.

This result seems to indicate that teachers have accepted the need for generic-transversal competencies to adequately perform their teaching functions (Morales & Cabrera, 2012). On one hand, Ethics and professional commitment is related to professional practice that promotes quality education for all, that is, inclusive education (Granjo et ál., 2020). On the other hand, constant social changes, the advancement of technology and the diverse needs of students require changes and innovations in education, which can generate uncertainty, insecurity and stress in teachers (Gratacós, Mena, & Ciesielkiewicz, 2021), such that Emotional Management is an essential competency for facing these situations (López Goñi y Goñi, 2012; Reoyo, Carbonero & Martín, 2017).

By contrast, the lesser importance given to Educational assessment, and Instruction planning and management, may indicate that teachers oversimplify their conception of these competencies (Zabalza, 2004); or they hesitate to acknowledge higher importance because of the difficulty in addressing them (Vázquez-Cano, 2016). Competency-based assessment is a challenge for teachers due to its methodological implications; however, teachers may not be fully aware of this if they continue to carry

out assessment based on content rather than performance (Villardón-Gallego, 2006).

Regarding level of performance, teachers consider that they apply the transversal competencies in greater measure than the key competencies, which are specific to teaching functions. This result could mean that teachers are more critical about their performance in specific, well-understood teaching functions, due to their familiarity and to having reflected more on their own effectiveness in these tasks (Maaranen, & Stenberg, 2020).

Only the transversal competence in Learning, research and innovation is positioned among the least applied, confirming the distance between educational practice and the innovations proposed from research, a gap that makes it difficult to improve educational processes (Álvarez, 2015). In effect, teachers do not always find answers in research to their problems of practice (Dumont, Istance & Benavides, 2010). In this regard, it is essential to bring research and teaching closer together, making teachers the agent and not the object of research (Farley-Ripple, May, Karpin, Tilley & McDonough, 2018). On the other hand, school culture or institutional inertia predispose the teacher to continue with "business as usual" (Carbonell, 2005; Edwards, Carr & Siegel, 2006; Gather, 2004).

A high percentage of participants were found to self-assess very positively, giving themselves values of 5 in the actions presented in the items, which are performance indicators of the competencies being assessed. This may be due to good job performance, with high perceived efficacy (Granjo et al., 2021), or to a low capacity for self-criticism regarding their professional practice (Gratacós et al., 2021). It might also be a defensive response, not necessarily conscious, in the face of an assessment situation that generates fear and distrust (Catalán & González, 2009).

The IPA analysis of the discrepancy between the importance that teachers assign to each competency and the level at which they apply it has made it possible to determine the areas where improvement efforts should be directed and, therefore, to draw conclusions for optimizing pre-service and in-service teacher training. In this same line, Elexpuru, Martínez, Villardón and Yániz (2006) used this technique to diagnose training needs in university professors.

Because the traditional placement of the Importance-Accomplishment axes results in all competencies being located in the same quadrant

(high importance and high performance), giving minimal information for improvement, we followed the recommendations of Martilla and James (1977) and of Ábalo et al. (2006), modifying the scale of the graph and taking 3 as the starting value for the coordinate axes. Despite this modification, the competencies fall mainly in two quadrants, the "Concentrate Here" quadrant and the "Keep up the good work" quadrant. For this reason, we decided to place the origin of the axes at the overall mean scores for importance and performance (Ábalo et ál., 2006). In this way, the analysis of the distance between the two means helps us identify the competencies that need to be addressed with higher priority, and those that do not require urgent attention. The main results obtained from the discrepancy analysis place the competencies in different quadrants or areas.

In the "Concentrate Here" quadrant we find competencies that are applied at a very low level, considering their great importance. These competencies were Curriculum management and implementation and Guidance. Although teachers may adopt a competency-based educational approach at the discursive level, implementation of the curriculum requires changes in practice: increasing students' protagonism in their own learning, encouraging collaboration and peer learning, improving the classroom climate and getting past knowledge transmission; facilitating the integration of ICT resources in the classroom, as well as meeting the diverse needs of students (OECD, 2019; 2009). To this end, it would be helpful in pre-service training to reinforce experimentation with diverse methodologies that favor competency development as well as attention to diversity, integrated use of languages, and the use of ICT as a means for learning and for transfer to educational practice. It has been found that teachers have difficulty incorporating technology in the classroom (Tirado-Morueta & Aguaded-Gómez, 2014) beyond its use as a resource to reproduce traditional forms of teaching (Sanz, Martínez-Piñeiro & Pernas, 2010). Therefore, it would be helpful for future teachers to experience integrated incorporation of ICT when developing their own teaching skills (Ruiz, Rubia, Anguita & Fernández, 2010).

On the other hand, in-service teachers' low levels of language competence, as classified under the Common European Framework of Reference for Languages (MECD, 2002), hinder integrated treatment of languages, coordination and collaboration with families and agents of the educational community, as well as participation in meetings, forums

or the interchange of teaching experiences and innovations. Language competency, therefore, is one area where efforts need to be focused if teachers are to meet current and future educational demands (Amor Almedina & Serrano Rodríguez, 2018).

Regarding the Guidance competency, teachers need to be trained to address the shared task of promoting students' personal, socioemotional and academic development, in coordination with their family, going beyond individual action (Iranzo-García et ál., 2020).

In the quadrant called *"Keep up the good work",* there is a balance between the importance given to these competencies and the degree that they are performed, even though certain aspects may need to improve. The Ethics and professional commitment competency was the highest valued and most implemented. This competency should continue to be worked on, so that quality education is offered to everyone, as directed by current legislation --though we are aware that educational improvement is not achieved merely by legislative change (Marcelo & Vaillant, 2011).

This quadrant also contains the competency in Teaching coordination and teamwork with the community. Teacher training should further emphasize coordination with agents in the community (Puigvert & Santacruz, 2006), and how to work in conjunction with families to encourage coherency in educational approaches and actions (Escorcia-Caballero & Gutierrez-Moreno, 2009). Similarly, coordination among teachers increases the effectiveness of education (Imbernón, 2020), so it is fundamental to develop competency in teamwork.

Teachers have been shown to experience stressful situations relatively often, sometimes producing symptoms of depression or the burnout syndrome (Gratacós et ál., 2021), possibly due to deficient emotional management (Hué, 2012). Difficulty in developing habits that favor personal and professional well-being and that help to manage stress indicate the importance of the competency in Emotional management and building environments of trust, even from the start of teacher training (López Goñi y Goñi, 2012; Palomera, Fernández-Berrocal & Brackett, 2008). When teachers feel better emotionally, they are more able to build a classroom atmosphere of trust and security, and adequately manage conflicts that arise (Camacho & Mendías, 2005).

In the "Low Priority" quadrant are competencies that are less valued and also less implemented. The competencies of Instruction planning and management and Educational assessment were placed here. Nonetheless,

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these competencies are fundamental to teaching practice. In fact, despite the fact that a competency-based curriculum has been in force since 2006, it is not fully applied in the educational system, neither in teaching nor in assessment (González-Mayorga, Vieira Aller, & Vidal García, 2017). Teachers should therefore continue being trained that they might effectively achieve the implementation of this educational paradigm shift (Tonda Rodriguez & Medina Rivilla, 2013; Villardón-Gallego, 2006). Teachers are sometimes reluctant in the face of these changes, and do not consider them important, even though studies reveal their effectiveness for learning (Álvarez Valdivia, 2008; Rodríguez & Hernández, 2014).

In this quadrant we also find the competency for Learning, research and innovation, despite the importance of basing educational innovation on scientific evidence, as the foundation of both educational improvement and professional development. Perhaps the quantity of new education plans that lack prior validation, and are promoted more out of fashion than in response to the real needs of schools (Coll, 2007), may have led to an increased task load with little meaning for teachers, resulting in reduced motivation for authentic innovation. It is therefore important to train and motivate teachers for educational improvement based on experiences that have been successful.

No competency was placed in the "Possible Overkill" quadrant, given that, in the teachers' opinion, no low-importance competency was being implemented disproportionately.

In short, taking into account the distance between performance and importance, the priority competencies to be emphasized in teacher training and development are the Competency in Learning, research and innovation, followed by the Competency in Instruction planning and management and the Competency in Guidance.

The level of importance assigned to each of the competencies is significantly higher among primary education teachers, which may be explained by a genuine interest in teaching reflected in their early choice of a college degree in Education (Esteve, 2006; Martínez-de-la-Hidalga & Villardón-Gallego, 2016). By contrast, secondary education teachers have often been found to show little interest in the teaching profession, which may hinder the success of any improvement processes (Fernández Enguita, 2006; Sánchez Asín & Boix, 2008). These results confirm the greater effectiveness of the concurrent or simultaneous training model (Rebolledo, 2015; Imbernón, 2019).

In this regard, it is important that secondary teachers develop teaching competencies and a professional identity during their pre-service training, with a solid pedagogical foundation (Reoyo et ál. 2017; Martínez-de-la-Hidalga, Villardón-Gallego & Flores-Moncada, 2020).

Conclusions

This study has demonstrated the usefulness of the IPA technique for identifying teacher training priorities, both for the design of training plans and for reflection during training. Training must address the priority of developing teaching competencies that are located in the "Concentrate Here" quadrant, that is, competencies that are considered important, but are insufficiently implemented. Giving priority to these competencies does not imply neglecting the development of teaching competencies found in the "Keep up the good work" quadrant, since their importance warrants their continued development. The results produced by the IP analysis provide information that we should reflect on as individuals and collectively, especially concerning competencies that teachers considered Low Priority, despite their confirmed relevance for educational improvement.

The analyses we conducted here confirm that teachers accept the teacher competency profile. They consider that transversal competencies like Ethics and professional commitment, and Emotional competency, are important for good teaching performance, and they recognize difficulties in developing key competencies like Instruction Planning and management, Curriculum management and implementation, and Educational assessment. Although a competency-based educational approach is officially mandated, there still seems to be a need for teachers to modify their role, to move from knowledge transmitters to acting as a guide and support for students' learning and development. In this process of change, evidence-based pre-service and in-service training takes on a fundamental role by offering forums for shared reflection on teaching practice (Goldhaber, 2018).

Primary teachers' greater identification with the teacher profile, in comparison to secondary teachers, underscores that the mode of access to the profession and the training model both have an impact in

professional development and educational practice, pointing to greater effectiveness with the concurrent model (Imbernón, 2019).

Nonetheless, we must note as a study limitation that the sample is not representative of the population, having been selected intentionally, even though we did maintain the proportionality of educational stage and of school type. On the other hand, the level of competency development was collected through self-reports, such that the information is based on teachers' perceptions. It would be interesting to complement these data with information collected through other techniques, such as observation of performance, or through other agents such as colleagues.

Despite these limitations, the study offers a methodological proposal for establishing training priorities, as well as for group reflection during the training itself. Similarly, it allows us to ascertain what importance teachers give to the teacher profile competencies, and their self-assessment with respect to their implementation of each one.

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Appendix

Descriptive analysis of the importance and performance of items associated with the teaching competencies.

TABLE A-I. Importance and Performance levels of the items from each teaching competency

TEACHING COMPETENCIES	IMPORTANCE		PERFORMANCE	
	M	SD	M	SD
Competency in Instruction planning and management				
C1_1- Participate actively in the development of school-wide projects such as curriculum projects, etc.	4.07	.897	3.47	1.173
C1_9- Design lesson planning according to competencies	4.15	.880	3.56	.983
C1_17- Develop teaching units and interdisciplinary projects that promote basic competency development	4.16	.874	3.40	1.006
C1_25- Use teaching materials that support learning	4.66	.562	4.18	.743
C1_33- Spread time evenly between different teaching tasks (classroom work, material preparation, planning, administrative tasks, etc.)	4.66	.562	3.39	1.016
Competency in Curriculum management and implementation				
C2_2- Apply methodologies that encourage students to be active in learning	4.68	.569	3.96	.732
C2_10- Do activities that promote cooperation between students	4.55	.640	3.94	.827
C2_18- Adapt activities to students' diversity	4.55	.693	3.74	.924
C2_26- Assign activities that have different possible solutions	4.18	.809	3.51	.914
C2_34- Design activities that require ICT use for their solution	4.12	.874	3.29	1.029
C2_41- Come up with ideas that require the use of (resources in) different languages	4.03	1.018	3.17	1.152
C2_48- Build an environment of trust in the classroom	4.75	.476	4.42	.675
C2_53- Encourage students' participation in class	4.80	.425	4.50	.653
C2_58- Design activities that spark students' interest in learning	4.75	.517	4.07	.807
C2_60- Direct and facilitate classroom work	4.69	.550	4.32	.706
C2_62- Guide students in their performance of learning tasks	4.65	.579	4.14	.789
C2_63- Connect learning with real situations or simulated, realistic situations	4.52	.683	3.90	.869
C2_64- Involve families and other agents in the educational community as support in learning activities	4.29	.834	3.38	.981

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TEACHING COMPETENCIES	IMPORTANCE		PERFORMANCE	
	M	SD	M	SD
C2_65- Respond effectively to novel or unforeseen situations	4.44	.699	3.69	.826
Competency in Educational assessment				
C3_3- Use assessment techniques and instruments that guide students toward competency development	4.39	.711	3.67	.816
C3_11- Use assessment to encourage learning	4.38	.723	3.96	.798
C3_19- Evaluate competency levels using previously established criteria as a reference	4.20	.783	3.65	.912
C3_27- Use assessment techniques that make it possible to evaluate students' performance	4.34	.734	3.66	.846
C3_35- Use assessment techniques and instruments that are consistent with the learning methodologies used	4.53	.627	4.02	.755
C3_42- Help students reflect on the tasks performed, so that they improve their learning	4.55	.634	4.02	.817
C3_49- Adapt my communication of assessment results according to the audience (students, family, school, administration)	4.57	.638	4.27	.785
C3_54- Foster self-assessment and peer assessment in students	4.31	.779	3.49	.921
Competency in Guidance				
C4_4- Detect student needs in order to effectively guide them individually and collectively	4.73	.503	4.03	.782
C4_12- Encourage students to know themselves and develop a well-adjusted self-concept	4.52	.669	3.82	.819
C4_20- Develop dynamics that foster students' self-confidence and recognition of their achievements	4.57	.627	3.95	.842
C4_28- Promote educational coordination with families	4.52	.735	3.85	.983
C4_36- Apply activities that encourage students to have a positive attitude toward diversity	4.59	.633	4.06	.835
C4_43- Help students to identify their emotions and control how they express them	4.55	.646	3.86	.915
C4_50- Take advantage of conflicts in the group and the immediate environment to develop social skills and prosocial attitudes	4.56	.669	3.99	.841
C4_55- Collaborate in activities that offer a service to the community to promote students' social participation	4.18	.846	3.23	1.019
Competency in Learning, research and innovation				
C5_5- Modify my teaching activity after reflecting on my professional performance	4.54	.636	3.90	.778
C5_13- Reflect on my own professional practice to detect strong points and areas for improvement	4.57	.627	3.95	.812
C5_21- Analyze my students' learning outcomes in order to improve my teaching	4.56	.619	4.02	.783

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TEACHING COMPETENCIES	IMPORTANCE		PERFORMANCE	
	M	SD	M	SD
C5_29- Stay up to date in knowledge of the disciplines, methodologies and teaching resources	4.54	.656	3.70	.821
C5_37- Take training that helps me improve my teaching	4.59	.625	3.82	.919
C5_44- Be informed about in-service teacher training that is available	4.35	.731	3.61	.911
C5_51- Look for resources in different media (forums, journals, etc.) to apply them in my teaching effort	4.26	.788	3.64	1.001
C5_56- Participate in innovative teaching projects	4.25	.853	3.32	1.072
C5_59- Share my teaching experiences with colleagues	4.54	.616	3.97	.843
C5_61- Participate in meetings or forums about teaching innovations and experiences	4.11	.857	3.07	1.052
Competency in Ethics and professional commitment				
C6_6- Reflect about the consequences of my teaching activity on students' development	4.63	.571	4.20	.755
C6_14- Be aware of how my teaching performance influences the surrounding social reality	4.37	.804	3.82	.939
C6_22- Ensure the confidentiality and proper use of students' assessment outcomes	4.60	.701	4.43	.791
C6_30- Keep the legal framework of my profession as a reference	4.14	.884	3.60	1.014
C6_38- Respect the confidential aspects of my profession	4.76	.554	4.61	.675
C6_45- Act as a model of respect and consideration toward all persons	4.72	.511	4.37	.711
C6_52- Act in a fair, equitable and respectful manner with students, families and colleagues	4.81	.466	4.51	.612
C6_57- Avoid any kind of discrimination toward students, families or colleagues	4.86	.420	4.69	.592
Competency in Teaching coordination and teamwork				
C7_7- Adopt the purposes of the school where I am working	4.47	.685	4.15	.779
C7_15- Work with members of the pedagogical team on development and assessment of competencies included in the programming.	4.22	.870	3.43	1.047
C7_23- Follow the shared norms, classroom and school guidelines, as well as teaching-learning methods that are common to the teaching staff	4.62	.639	4.02	.897
C7_31- Assess students' basic competencies by sharing techniques and information with other teachers	4.39	.748	3.78	.958
C7_39- Participate actively in the pedagogical teams that I belong to	4.56	.659	4.22	.809
C7_46- Agree on and respect rules of functioning between teachers and families	4.69	.560	4.30	.776

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TEACHING COMPETENCIES	IMPORTANCE		PERFORMANCE	
	M	SD	M	SD
Competency in Emotional management and building environments of trust				
C8_8- Regulate and effectively manage my own emotions in the classroom	4.60	.587	3.95	.748
C8_16- Dedicate time to solving problems that appear in any educational situation	4.63	.631	4.12	.912
C8_24- Relate well with my colleagues	4.65	.564	4.26	.711
C8_32- Control my own emotions in tasks carried out with other educational agents (colleagues, families)	4.38	.753	3.86	.852
C8_40- Manage the stress from everyday situations in this profession	4.63	.598	3.66	.853
C8_47- Create habits that promote my well-being on the job	4.57	.614	3.74	.880

M= Mean
SD= Standard Deviation
Source: prepared by the authors

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University admission scores as predictor of academic performance in the first year of university: Education VS Social Services Oriented Degrees[1]

La nota de acceso a la universidad como predictor del rendimiento en el primer año de carrera: grados de Magisterio versus otras carreras asistenciales

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Abstract

Several research studies have shown that admission scores seem to be a good predictor of academic performance during the undergraduate degree. It is a fact that the first year of the undergraduate program is the one in which most

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students drop out of the program. Considering this idea, the general objective of this study is to identify the access profile (previous academic performance) and predict the future performances of the students at the Universidad Complutense de Madrid (UCM). The study involves first year students who enter the Education Programs, as well as those who enter Degrees with a Social Service Orientation. To address this objective, a secondary analysis of the UCM census' data in the 2018/2019 academic year is carried out where the total sample is 2018 students. Several regression models are considered aiming to determine the effect of previous academic performance on the success rate (% of ECTS credits passed) at the end of the first academic year. The results show that the Education Degrees where admission scores have an impact on the success rate are those related to Primary Education. Furthermore, a differentiated profile was observed between Education Degrees compared to Degrees with a Social Service Orientation when explaining the success rate in the first year. In light of these results, it can be concluded that admission scores are a predictor of the academic performance achieved in the first year of the degree program, affecting in a differently students who pursue Education Degrees versus Social Services Oriented Degrees.

Key words: Education degree, social services-oriented degrees, academic performance, credits, regression models

Resumen

Diversas investigaciones demuestran que la nota de acceso a la universidad parece ser un buen predictor del rendimiento académico obtenido durante la carrera. Es un hecho que el primer curso de carrera es en el que se produce el mayor abandono. Partiendo de esta idea, el objetivo general que se plantea en este trabajo es conocer el perfil de acceso (rendimiento previo) y su efecto sobre el rendimiento en el primer año de carrera de los estudiantes de la Universidad Complutense de Madrid (UCM) que acceden a las titulaciones del grado de magisterio, así como de aquellos que acceden a otras carreras de carácter asistencial. Para dar respuesta a este objetivo se realiza un análisis secundario de los datos censales de la UCM en el curso 2018/2019 donde la muestra total es de 2018 estudiantes. Se plantean varios modelos de regresión con la finalidad de conocer el efecto del rendimiento previo sobre la tasa de éxito (% de créditos ECTS aprobados) al final del primer curso académico. Los resultados muestran que las titulaciones de magisterio donde la nota de acceso tiene un impacto sobre la tasa de éxito son las relativas a la etapa de Educación Primaria. Asimismo, se observa un perfil diferencial entre las titulaciones de magisterio y otras titulaciones de carácter asistencial, a la hora de explicar la tasa de éxito en el primer curso. A la vista de estos resultados se puede concluir que la nota de acceso a la universidad es un predictor del rendimiento académico obtenido en el primer año de carrera que afecta de manera diferente a los estudiantes que cursan carreras de magisterio versus otras carreras asistenciales.

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Palabras clave: Titulaciones de magisterio, titulaciones asistenciales, rendimiento académico, créditos, modelos de regresión

Introducción

The causes associated to dropout rates in the first year of university studies are a concern that has sought to be analysed in recent decades (Organisation for Economic Co-operation and Development, 2008; Rooij, et al., 2017). As such, several research projects have focussed on studying the variables that may be associated with academic success during the first university year and that, as a result, could explain a substantial part of the university dropout rate (García, 2014; Fonteyne et al., 2017; Hepworth et al., 2018; Respondek et al., 2017).

Academic performance depends on a range of factors, the identification and effect of which could provide a more comprehensive overview that allows decisions to be made that improve the quality of education. In this regard, Schneider & Preckel (2017) identified in their meta-analysis a total of 105 variables in two areas related to students themselves or with the education process that could affect academic performance. Furthermore, Garbanzo (2007), established 26 factors arranged into three categories: personal determinants, social determinants and institutional determinants.

Despite the fact that all the variables identified appear to have an effect on academic performance, several national and international studies (Cerdeira, et al., 2018; Danilowicz-Göselea, et al., 2017; Fernández-Mellizo & Constante-Amores, 2020; Gallegos & Campos, 2019; Jiménez-Caballero et al., 2015) suggest that the university entry or admissions grade, a personal determinant according to Garbanzo (2007), is the best indicator for predicting the academic performance of students during the first degree year. Jiménez-Caballero et al. (2015) concluded, in a study undertaken at the University of Sevilla with 572 students enrolled on the first year of the finance and accounting course, that the entry grade is an explanatory factor in academic performance, implying on average an additional point in every subject grade. Gallegos & Campos (2019) arrived at the same conclusion, indicating not only a positive and

significant effect on academic performance in the first year, but also that they observed the same effects in the fourth degree year.

Furthermore, Fernández-Mellizo & Constante-Amores (2020), in a study on determinants of academic performance, which included 10,720 students at the Complutense University of Madrid, concluded that the university entry grade is the most important predictor of students' academic performance. Other authors, such as Danilowicz-Göselea et al. (2017), in a study conducted with 12,000 students on different degree courses at Göttingen University, which included humanity, social science and technical degrees, confirmed that although the magnitude of the effect depends on the degree course studied, the grade obtained in pre-university studies has a significant and positive effect, so much so that those who enter with lower grades are much less likely to graduate than those with higher grades.

Cerdeira et al. (2018) did a similar analysis in Portugal, analysing different factors, among them the entry grade and the final grade obtained in secondary education of 23,632 students. These authors found that the entry grade and the final grade obtained in secondary education can be used to significantly predict the final degree grade. Furthermore, on including other variables in the analysis, the explication did not change. As such, these two variables are by far the ones with the greatest predictive value in terms of the grades obtained at the end of university studies. Rodríguez et al. (2004) and Tejedor (2003) suggest that this important effect of the entry grade can be explained as being a reflection of other academic achievements in which other personal, social and institutional determinants also have an influence.

Admissions profile of students on teaching and care-related degrees

The large-scale international educational evaluation programmes, such as PISA, TIMSS and PIRLS, have shown the situation in terms of educational achievement of the different participating countries. In all of them in which the relative position is unsatisfactory, as is the case of Spain, social and political actions have taken place with the aim of adopting measures to remedy the shortfalls perceived. As a result of this increased focus on possible corrective measures, some international reports (OECD, 2017) show the importance of the qualifications and efficiency of teachers and,

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therefore, the impact that their training has on the academic results of their students.

The fundamental role of teachers in the quality of the education given is a fact backed by sufficient empirical evidence (Ponce et al., 2020; Rus et al., 2019; Vaillant & Rodríguez, 2018). However, the characteristics of those who study degrees corresponding to the teaching profession are not determined and neither standardised tools nor procedures exist for selecting those who aspire to be teachers or professors, a fact that heightens the concerns of governments in improving the quality of academic staff. In this regard, Hanushek (2016) concluded that students who have had for one year professors or lecturers with a relative efficiency position in the 90th percentile or higher, learn the corresponding material 150% more than students taught by professors or lecturers in the 10th percentile or lower (Hanushek et al., 2016). Furthermore, the McKinsey report affirms "the quality of an education system cannot exceed the quality of its teachers" (Barber & Mourshed, 2007, p.13).

As in the studies previously mentioned, prior performance also seems to be a predictor of subsequent academic performance in teaching degrees. In this regard, Belvis et al. (2009) conducted a study on academic success with 2,476 students on pedagogy, psycho-pedagogy, teaching and social education degrees at seven different Spanish universities. In the study they found that, among other factors that affect student success in higher education, the prior academic preparation of students has a very direct impact on their subsequent results. Also in this study, as well as in that of Barahona (2014) and Cortés & Palomar (2008), the university entry grade is considered as another factor that predicts subsequent academic performance.

In addition to the grades obtained by students, the credits passed and the study hours accumulated are two further indicators generally used to operationalise academic performance. As such, the Ministry of Science, Innovation and Universities used the credits passed as an indicator to calculate performance and success rates (Integrated University Information Systema [SIIU], 2019).

Taking into account, on the one hand, the effects of academic staff efficiency and, on the other, the importance prior performance seems to have as a predictor of students' academic futures, knowing the student profiles interested in university degrees linked to the teaching profession appears particularly relevant. In 2006, the PISA programme (OECD,

2008) surveyed students from several countries about which profession they thought they would be working in at the age of 30. Only 5% of those surveyed saw themselves working as teachers or professors. Among the males surveyed, no more than 3% aspired to be teachers, while this figure rose to 6% among females (OECD, 2015). However, the biggest concern, regardless of gender, related to students whose mean grade in reading and maths skills was below the average. The major concern is that, in most countries, the low skill level of those who aspire to become teachers also coincides with low performance rates, obtained by working teachers in similar tests, as shown in the *Survey of Adult Skills* of the PIAAC (Programme for the International Assessment of Adult Competencies) (OCDE, 2016).

Camina & Salvador (2007) found a great variability in the characteristics of students on different teaching degrees. On more specialised degree courses, such as physical education, music education and foreign languages, there was a great variability in terms of age. Furthermore, students on pre-school education and physical education degrees, largely came from vocational training. In terms of academic performance, most of those who started said studies obtained in entrance exams scores of between 5 and 6 points. Similarly, between 20% and 50% would have preferred to have studied something else, which suggests that not all had a real interest in teaching.

All the foregoing is of particular concern considering that prior performance, as previously mentioned, is a predictor of subsequent academic performance. Therefore, a low entrance skill level allows us to predict a low performance on the degree course, ultimately affecting the quality of teachers and, therefore, the education provided.

In addition to teaching degrees, knowing the student profile of other degrees that prepare individuals for similar professions, due to their care or service-to-society nature, is of interest. Care professions are those with a common social purpose that are linked to contextualised degrees in the social, healthcare and educational field. In this study, degrees linked to the care professions in the database of the Student Observatory (*Observatorio del Estudiante*) of the Complutense University of Madrid have been considered as such, which include: dual degree in psychology-speech therapy, degree in speech therapy, degree in psychology, degree in social education, degree in pedagogy, degree in social work, degree in occupational therapy.

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The aim of this study is to discover the university entry or admissions profile (prior academic performance) and its effect on performance in the first degree year of students at the Complutense University of Madrid (UCM) on the single and dual degree courses in teaching (in pre-school education and in primary education), as well as of those who study other care-related degrees. To specify the general objective, the following specific objectives have been established:

– To comparatively study the impact of the entry grade in studies that provide access to the teaching profession.
– To study if the effect of the university entry grade determines, in a different manner according to the degrees considered, academic performance in the first year (percentage of credits passed over those enrolled on).

Method

This study used a quantitative methodology, specifically, a non-experiment design in which a secondary analysis of the UCM census data was conducted for the 2018/19 year, provided by the Student Observatory of said university.

Participants

The participants in this study were students who first accessed the different teaching and care-related degree courses at UCM in academic year 2018/2019, which entailed a total of 2,018 subjects, of which 643 were students on the teaching degrees of the Faculty of Education and Teacher Training Centre and 1,375 students on degree courses linked to care professions.

Table I sets out in further detail the teaching and care-related degrees, the sampling distribution of participating students, as well as the mean and standard deviation in each degree of the university entry grade and of the centred entry grade regarding the mean of the degrees considered.

TABLE I. Sampling distribution according to the type of degree (teaching or care-related)

Degree		Frequency	Percentage	Mean entry grade (Standard dev.)	Centred mean entry grade (Standard dev.)
Teaching (31.8%)	Dual degree in pre-school education - primary education teaching	54	8%	10,421 (.888)	1,164 (.888)
	Dual degree in pre-school education teaching - pedagogy	47	7%	9,811 (1137)	.554 (1137)
	Dual degree in primary education teaching - pedagogy	48	8%	11,082 (.951)	1,824 (.951)
	Degree in primary education teaching	258	40%	9,055 (1194)	-.202 (1194)
	Degree in pre-school education teaching	236	37%	8,319 (.763)	-.938 (.763)
Care-related (68.2%)	Dual degree in psychology-speech therapy	50	3.6%	10,615 (.891)	1,358 (.891)
	Degree in speech therapy	56	4.1%	8,900 (.720)	-.357 (.720)
	Degree in nursing	267	19.4%	11,022 (1211)	1,764 (1211)
	Degree in psychology	408	29.7%	9.4185 (1102)	.161 (1102)
	Degree in social education	93	6.8%	9,451 (1009)	.194 (1009)
	Degree in pedagogy	90	6.5%	8,776 (.726)	-.481 (.726)
	Degree in social work	340	24.7%	7,855 (1028)	-1,402 (1028)
	Degree in occupational therapy	71	5.2%	9,460 (.856)	.203 (.856)

The average age of students is 20, in both teaching and care-related degrees, ($SD_{teaching}$= 2.88; $SD_{care\text{-}related}$=3.97), with 18 and 52 being the lowest and highest age, respectively, in the teaching degrees and 58 the highest in the care-related degrees. 17.9% of the students are male and 82.1% female in the teaching degrees, a trend also reflected in the care-related degrees, where 15.3% are male and 84.7% female. As regards the nationality of students, 97% and 95.5% on the teaching and care-related degrees, respectively, are Spanish.

The university admissions route for the teaching degrees was: further education (*bachillerato*): 72.5%; VT: 26.1%; over 25s: 6%; graduates:

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6%; over 45s: 2%. As regards care-related degrees: further education (*bachillerato*): 80.6; VT: 17.2%; graduates: 4%; over 25s: 1.3%; over 40s 3%; and over 45s: 2%.

Process

The data used in this study was sourced from the anonymous information that the Complutense University of Madrid (UCM) reports each year to the Integrated University Information Systema (SIIU) and that has been provided by the Student Observatory of the UCM. Specifically, the data used for this analysis correspond to academic year 2018/19.

As regards the variables used in this study, the dependent variable relates to academic performance, understood as the rate of ECTS credits passed in the first year. On the teaching degrees, the average rate is 84% and, on care-related degrees, 79.5%.

As predictor variables, the type of degree (categorised as teaching or care-related degrees, Table I) and the university entry or admissions grade, understood as the total of the further education (*bachillerato*) grade (60%), results in the entrance exams (40%) and an additional 10% or 20% for the best grades obtained in the voluntary phase, depending on the degree course chosen, are the variables used. In order to facilitate the interpretation of the regression equation constant, the university entry grade has been centred on the mean entry grade of the students accepted onto the degrees in this study (teaching and care-related). As such, the value of the constant allows us to find the value of academic performance when the value of the university entry grade corresponds to the mean. Information on said variables is provided in Table II.

TABLE II. Descriptive statistics of the university entry grade variable.

	Degree type	N	Minimum	Maximum	Mean	Standard deviation
University entry grade	Teaching degrees	643	5.29	13.33	9,106	1,307
	Care-related degrees	1375	5.00	13.33	9,328	1,509
University entry grade centred on the mean entry grade of the sample used (centred entry grade)	Teaching degrees	643	-3.97	4.07	-.151	1,307
	Care-related degrees	1375	-4.26	4.07	-.071	1,509

To meet the first specific objective –comparatively studying the impact of the entry grade in teaching studies–, a simple regression was undertaken comparing the teaching degrees (degree in primary education teaching, degree in primary education teaching (*sic.*), dual degree in pre-school education - primary education teaching, dual degree in pre-school education teaching - pedagogy, dual degree in primary education teaching - pedagogy) and using the entry grade as a predictor and the success rate in the first degree year (number of credits passed/number of credits enrolled on) as the criterion.

To meet the second specific objective –studying the differential effect between the entry grade and the type of degree on academic performance in the first year, different according to teaching or care-related degrees–, three regression models were undertaken, which will be represented with the corresponding equation in the results section: the null model used as a reference model to demonstrate any improvement in the predictor-related models that are going to be estimated; model 1, which is going to study the effect of the university entry grade, and model 2, which analyses the differential effect of the entry grade, type of degree and the relationship between them.

The stepwise method was used to select the variables, which Pardo & Ruiz (2013) say is a combination of the forward and backward methods, where first the variable that more closely correlates with the dependent variable is chosen, followed by the variable with the highest partial correlation coefficient.

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To study the adjustment of the model, the residual is calculated, and the error reduction of the models with predictors is studied with regard to the null model. Therefore, the ratio between the difference of the deviance of the reference model and that of the proposed model and the deviance of the reference model is calculated (Pardo & Ruiz, 2013). Furthermore, R^2 is calculated, which is the quotient between the explained variation and the total variation. Finally, AIC and BIC are used, which are modifications of the deviance, very common in both nested and non-nested comparison models (Montesinos, 2011). Furthermore, in all the predictor models, the size of the effect is calculated with Cohen's d formula, where values around .20 indicate a small effect size, values around .50 a medium effect size and values around .80 and higher a large effect size (Cohen, 1992).

To guarantee the validity of the linear regression models, the residual independence assumptions, through the Durbin-Watson test statistic, and the non-collinearity assumptions, through tolerance and VIF estimations, were verified. The Durbin-Watson test values were within the range of 1.5 and 2.5, which allows us to accept the assumption of independence between the residuals (Durbin & Watson, 1971). In terms of the non-collinearity assumption, the tolerance of the models reflects values that exceed the minimum of .200 (Menard, 2002), which allows us to rule out collinearity and multi-collinearity issues. The variance inflation factors (VIF) once again allows us corroborate compliance of the non-collinearity assumption, given that the values reached in both do not exceed the limit of 10 (López, 1998).

For the statistical analysis, the SPSS program version 25.0 (IBM ® SPSS® Statistics 25) and the G*Power 3.1 program (to calculate the size effect) were used.

Results

The results section is arranged in two blocks, one for each research objective proposed in this study, where the different estimated regression models and the adjustment corresponding to each one are set out and interpreted.

Study comparing the impact of the entry grade on teaching studies

Firstly, Table III shows, for each teaching degree, the descriptive statistics of the variable considered for the study: academic performance (understood as the percentage of ECTS credits passed in the first year) and centred university entry grade. As can be seen, the highest percentage of ECTS credits passed in the first year corresponds to the dual degree in pre-school education teaching - pedagogy, while the lowest corresponds to the degree in pre-school education teaching. As regards the university entry grade, the students on the dual degree in primary education teaching and pedagogy obtained the highest grade (1.846 points above the mean of participants), while the lowest entry grade was obtained, once again, by those on the degree in pre-school education teaching (.802 points below the mean grade).

TABLE III. Descriptive statistics of the simple regression model

Degree	Variables	Mean	Standard deviation
Dual degree in pre-school education - primary education teaching	ECTS passed/enrolled on	88,338	22,145
	Centred entry grade	1.1750	.9287
Dual degree in pre-school education teaching - pedagogy	ECTS passed/enrolled on	93,650	11,613
	Centred entry grade	.6424	.929
Dual degree in primary education teaching - pedagogy	ECTS passed/enrolled on	90,044	20,770
	Centred entry grade	1,846	.949
Degree in primary education teaching	ECTS passed/enrolled on	81,870	21,874
	Centred entry grade	.1095	1,254
Degree in pre-school education teaching	ECTS passed/enrolled on	81,138	26,525
	Centred entry grade	-.802	.804

The results obtained in the simple regression analysis are set out in Table IV, where teaching degrees and the impact that entry grades in said

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degree courses have on the success rate in the first year are compared. The results suggest that in three teaching degrees the university entry grade has a significant influence on the success rate.

TABLE IV. Estimation of the effects of the simple regression analysis.

							Confidence interval	
Degree	**Parameter**	**Estimate**	**Standard error**	**df**	**t**	**Sig.**	**Lower limit**	**Higher limit**
Dual degree in pre-school education - primary education teaching	Intercept	78,674	4,870	47	16,154	.000	68,877	88,472
	Centred entry grade	8,224	3,264	47	2,519	**.015**	1,657	14,791
Dual degree in pre-school education teaching - pedagogy	Intercept	92,275	2,181	40	42,301	.000	87,867	96,684
	Centred entry grade	2,140	1,946	40	1,100	.278	-1,793	6,074
Dual degree in primary education teaching - pedagogy	Intercept	72,399	6,078	45	11,913	.000	60,158	84,640
	Centred entry grade	9,557	2,933	45	3,257	**.002**	3,647	15,465
Degree in primary education teaching	Intercept	81,219	1,543	178	52,642	.000	78,174	84,264
	Centred entry grade	5,947	1,228	178	4,840	**.000**	3,522	8,372
Degree in pre-school education teaching	Intercept	84,687	3,369	121	25,138	.000	78,018	91,357
	Centred entry grade	4,424	2,972	121	1,488	.139	-1,460	10,307

In the case of the dual degree in pre-school and primary education teaching, as can be seen in the regression equations (Eq.1), for every point the university entry grade of these students increases, an 8.2% increase would be seen in the credits passed in the first year.

$$\hat{Y} = 78.674 + 8.224X_1 \qquad \text{Eq.1}$$

The greatest increase corresponds to the dual degree in primary education teaching - pedagogy (Eq.2), where for every point the university entry grade increases, a 9.5% increase would be seen in the credits passed in the first year.

$$\hat{Y} = 72.399 + 9.556X_1 \qquad \text{Eq.2}$$

With regard to the degree in primary education teaching, the increase is somewhat lower (Eq.3), as for every point the university entry grade increases, a 5.9% increase would be seen in the credits passed by those students in the first year.

$$\hat{Y} = 81.219 + 5.947X_1 \qquad \text{Eq.3}$$

A more intuitive way of interpreting these results would be to transform the percent of credits passed into the study hours dedicated by the students, using as a reference the guidelines of the European Higher Education Area, which establishes that the ECTS credits entails approximately 25 study hours (European Commission, 2017).

In the majority of the degrees, the most frequent distribution of the number of ECTS credits per academic year is usually 60 ECTS, accepting this datum as the total of the enrolled-on credits, we could affirm that the students on the degree in primary education teaching that have an entry grade 1 point higher than the average, would pass 3.54 ECTS credits (5.9%), which would equate to 88.5 study hours.

The dual degrees correspond to approximately 80 ECTS in the first year. As such, in the case of the dual degree in pre-school and primary education teaching, the students that have a university entry grade 1 point above the average, would pass 6.56 ECTS credits (8.2%) more than the other students, equating to 164 study hours by the students; on the dual degree in primary education teaching - pedagogy, the students would pass 7.68 ECTS credits more than the other students that is, 192 study hours.

Lastly, it is worth mentioning the existence of another two degrees where the university entry grade does not have a significant influence on the number of credits passed in the first year. These are: the dual degree in pre-school education teaching - pedagogy, and the degree in pre-school education teaching.

In terms of the adjustment of the model (Table V), it is exclusively presented for the three cases in which the university entry grade has a significant influence on the success rate. In said degrees, the residual is reduced, achieving an explanatory power of 15%, 31% and 18%, respectively, with large effects in all cases (d=.844; d=1.352; d=.944, respectively). As regards AIC and BIC, lower values are observed in the dual degree in primary education teaching - pedagogy, which suggests that the simple regression model adjusts better.

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TABLE V. Adjustment of the simple regression model

Degree	Residual	Residual reduction	Explanatory power	R2	AIC	BIC	Cohen's d
Dual degree in preschool education - primary education teaching	441,249	78,557	15.1%	.151	429,207	431,057	Large effect (.844)
Dual degree in primary education teaching - pedagogy	356,871	162,935	31.3%	.313	401,761	403,568	Large effect (1.352)
Degree in primary education teaching	425,210	94,595	18.2%	.182	1595.336	1598.518	Large effect (.944)

Differential effect between the entry grade and the type of degree

Table VI is a summary of the descriptive statistics of the variables that are going to be used in the estimated regression models: success rate (percentage of ECTS credits passed in the first year), centred university entry grade and type of degree (teaching and care-related).

The results show a higher percentage of ECTS credits passed in the first year on the teaching degrees, while the university entry grade is higher in care-related degrees (specifically, .3 points above the average entry grade).

TABLE VI. Descriptive statistics of the multiple linear regression models

Variables	Mean	Standard deviation
ECTS passed/enrolled on	80,913	24,212
Centred entry grade	.296	1,394
ECTS passed/enrolled on (teaching)	84,377	22,799
Centred entry grade (teaching)	.2095	1,336
ECTS passed/enrolled on (care-related)	79,467	24,644
Centred entry grade (care-related)	.332	1,417

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To meet the second specific objective, which consists of studying the differential effect of the entry grade, the type of degree and the relationship between both, the three regression models in Table VII were considered.

TABLE VII. Estimation of the effects of the multiple linear regression analysis

							Confidence interval	
Model	**Parameter**	**Estimate**	**Standard error**	**df**	**t**	**Sig.**	**Lower limit**	**Higher limit**
Null model	Intercept	80,913	.625	1496	129,301	.000	79,686	82,141
Model 1	Intercept	80,143	.632	1495	126,657	.000	78,902	81,384
	Centred entry grade	2,599	.443	1495	5,855	.000	1,728	3,470
Model 2	Intercept	78,890	.750	1493	105,094	.000	77,417	80,362
	Centred entry grade	1,734	.515	1493	3,481	.001	.7226	2,746
	[Type of degree=teaching]	4,401	1,368	1493	3,215	.001	1,716	7,086
	[Type of degree= care-related]	0[b]	0	.	.	.	.	.
	[Type of degree=teaching] *Entry grade	3,452	.991	1493	3,481	.001	1,506	5,397
	[Type of degree=care-related] *Entry grade	0[b]	0	.	.	.	.	.

Dependent variable: ECTS passed/enrolled on (success rate).
b. This parameter is established on zero as it is redundant.

Regarding the results of model 1, the university entry grade has a significant influence on the academic performance (understood as a percentage of the credits passed in the first year). Said influence is represented in the following regression equation (Eq.4), where for each point the university entry grade increases, the students in the sample would increase by 2.59% the credits passed in the first year.

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$$\hat{Y} = 80.913 + 2.599X_1 \qquad \text{Eq.4}$$

Model 2 adds, to the study of the effect of the entry grade, the type of degree (considering two categories: teaching and care-related) and the relationship between both factors.

The regression equation (Eq.5) represents the model.

$$\hat{Y} = 78.890 + 1.734X_1 + 3.452X_2 + 4.401X_3 \qquad \text{Eq.5}$$

From it, it is worth mentioning that:

- Regardless of the type of degree, for each point the university entry grade increases, the credits passed in the first year would increase by 1.73%.
- Considering the two types of degree, the students on the teaching degrees would increase by 4.40% the credits passed in the first year compared with the students on the degrees in the care-related category.
- Finally, the effect of the relationship between both variables indicates that for each point the university entry grade increases of students on teaching decrees, the credits passed in the first year would increase by 3.45%.

As a result, model 2 allows us to interpret that for every point the university entry grade of the teaching degree students increases, the credits passed in the first year would increase by 9.6% (1.73% effect of the university entry grade + 4.40% for belonging to the teaching degree group + 3.45% of the cross effect of the entry grade and teaching degree).

Lastly, the adjustment is shown of each of the estimated models with respect to the null model. In Table VIII, it can be seen how in model 1, which includes the centred university entry grade as a predictor, the residual is reduced, achieving an explanatory power of 2.2% and a small effect size (d= .2993). With regard to model 2, greater explanatory power, specifically of 3.8%, and a medium effect size can be seen, which is higher than in the previous model (d=.4). Despite there being an improvement in explanatory power in model 1 over model 2, the R^2 is moderate, due to the fact that there are many other variables that may affect the success

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rate in the first year. Finally, AIC and BIC have lower values in model 2, which suggests, once again, that this model has a better adjustment.

TABLE VIII. Adjustment of the multiple linear regression models

Model	Residual	Residual reduction	Explanatory power	R2	AIC	BIC	Cohen's d
Null model	586,226				13789.841	13795.151	
Model 1	573,467	12,759	2.2%	.022	13755.706	13761.015	Small effect (.299)
Model 2	563,948	22,278	3.8%	.038	13724.426	13729.735	Medium effect (.397)

Conclusions

The results obtained in relation to the first objective formulated in this study allow us to confirm that there are differences as regards the impact that entry grades have on the percentage of credits passed according to the teaching degree studied. As has been observed, the degrees in which entry grades have an effect on the success rate are those relating to primary education teaching, specifically dual degrees in pre-school education teaching with primary education teaching and primary education teaching with pedagogy, as well as the degree in primary education teaching. No impact has been observed in the degree in pre-school education teaching or the dual degree in pre-school education teaching and pedagogy. It is interesting that the entry degree has an influence on the results of students on primary education degrees but not on those on pre-school education degrees. That would be, therefore, the first conclusion of the study: that the students in classrooms in the first year of primary education degrees at the UCM may be less [*sic*.] influential in terms of success rates than those on pre-school education degrees, where the grade with which they were accepted at the university appears to have no influence. Of course, this assertion should be accepted with caution, given that one of the limitations of this study is, without doubt, the use of success rates as the sole indicator of academic performance in the first year. The number of credits passed at the end of the first

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university year in degrees where the success rate is traditionally high, cannot give rise to categorical conclusions given that, as it is a transversal study, the differences found between students on both degrees could be due to other factors unrelated to the university entry grade.

Despite a lack of studies in the literature that delve into the characteristics of the teaching student profile according to degree, similar results may be seen in the study conducted by Belvis et al. (2009) with students in the first and final year of pedagogy, psycho-pedagogy, teaching and social education degrees, given their conclusion that the factors relating to the prior academic record and the entry grade are significantly linked to performance.

This study also had a second objective, which was related to the differential effect on university entry grades between the teaching degrees and other care-related studies at the Complutense University of Madrid. The results show that the entry grade alone, regardless of the type of degree studied, has an influence on the success rate, which is something completely coherent with the studies conducted on prior performance as a predictor of academic performance. Similarly, the fact of studying a degree linked to the teaching profession also appears to have an influence on the success rate. Are they easier than other care-related degrees? Are the students more vocation-oriented and perhaps more motivated, which could lead to a higher success rate? Lastly, a considerable influence seems to exist when both aspects converge: entry grade and teaching studies.

These differences in the predictive capacity of entry grades on performance according to the studies undertaken are found in other research, such as that of Garbanzo (2007), who finds a differentiation between degrees, in this case, according to demand, concluding that the entry grade is an important predictor of academic performance in high-demand degrees, but not in those of low demand.

In any case, this relationship has been emphasised in many other studies, as seen in the meta-analysis of Richardson et al. (2012) or the work of Gallegos & Campos (2019), Cerdeira et al. (2018), Barahona (2014), Ukpong & George (2013) and Cortés & Palomar (2008), which show very similar results.

The study of Fernández-Mellizo & Constante-Amores (2020) suggests that entry grades explain more than 6% of the performance variance in universities and it is by far the variable with the greatest predictive

capacity of performance out of the 11 considered. Danilowicz-Göselea et al. (2017) supports this idea by suggesting that the entry grade is the best predictor of final grades and of the likelihood of finishing university studies. The study by Jiménez-Caballero et al. (2015) also indicates the impact of the entry grade on performance, suggesting that every point increase in the entry grade translates to around one additional point in the grades of degree studies, in this case with students in the first year of the degree in finance and accounting.

However, this study, as previously stated, has a number of limitations. The results are from one single university, the Complutense University of Madrid, and a sole cohort of students, which does not guarantee the external validity of the study. Furthermore, the explanatory power of the models is moderate, which means that other variables would have to be considered that allow the residual variance to be explained. Thus, we should be cautious and prudent in interpreting these results due to factors such as the level of difficulty of each degree, the size of the sample of each degree and the care-related degrees selected, which entail important limitations.

Therefore, replicating this study with data from other universities and more cohorts is deemed important in order to establish comparisons. In this regard, it is considered appropriate that future studies take into account other variables that the literature deems influential in academic performance. For example, Fernández-Mellizo & Constante-Amores, (2020) studied the effect of eleven variables grouped into three factors: demographic, socio-economic and academic, of which four of them (university entry grade, type of centre in secondary education, sex and autonomous community of the family) were statistically significant in the final model. Another noteworthy study is that of Richardson et al. (2012) in which five distinct but conceptually overlapping research domains were identified: personality traits, motivational factors, self-regulatory learning strategies, students' approaches to learning, and psychosocial contextual influences. Finally, another variable that would be interesting to explore, due to having shown that it is influential in academic performance, is the branch of further education (*bachillerato*) to which the prior studies of university students belong, differentiating from STEM and non-STEM studies. Studies such as Perez-Felkner et al. (2012) and Henoch et al. (2015) highlight the existence of cognitive and personal differences

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among students whose studies belong to the STEM or non-STEM group and that these can affect in a different way academic performance.

In conclusion, this study, albeit with limitations, points to the idea that students on teaching degrees (particularly those linked to the stage of primary education) with a high university entry grade have many possibilities of obtaining a high success rate in the first university year. Discovering the profile of students that drop out of teaching degrees in the first year would be interesting so as to contrast hypotheses such as those on vocation, degree admissions grades and the level of degree difficulty.

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Teacher training and professional development in accordance with level of school effectiveness

Formación y desarrollo profesional docente en función del grado de eficacia escolar

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Abstract

This study forms part of a larger research project focusing on school improvement in the Autonomous Community of the Basque Country, which analyses schools with different achievement outcomes in the Diagnostic Assessments in order to identify transferable practices. Here, the focus is on teacher training, since previous research has shown that when they become learning organisations, schools offer positive results not only in terms of student outcomes, but also in relation to teacher training. The methodology comprised three phases: in the first, multilevel regression modelling techniques were used to identify 44 schools with different achievement outcomes; in the second, 39 management teams and 35 school inspectors were interviewed, and 10 discussion groups were held with teachers. Finally, further information was gathered by means of a questionnaire. The results reveal that teacher training and teachers' professional development is an important issue in all schools, and significant investments are made to foster it. Nevertheless, in schools with higher levels of effectiveness, training is seen as something associated with a collective need rather than personal motivation, a perspective that fosters the planning of joint projects with shared aims. The recognition of differing needs in terms of resource allocation and the identification of more vulnerable groups are associated

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with institutional support and education policies. The study confirms the need for a set of basic conditions (stable team, administrative support, planning and management) to ensure the establishment of dynamics that help schools become learning organisations, enable professional growth and contribute to the optimisation of student outcomes.

Keywords: Teacher training, professional development, school effectiveness, resource allocation, social integration

Resumen

El trabajo se enmarca en la línea de investigación de la Mejora escolar en la Comunidad Autónoma Vasca, centros con resultados diversos en logros que se reflejan en las pruebas de evaluación diagnóstica, son estudiados con el fin de explicar prácticas transferibles. Se ha puesto el foco en la formación docente, tomando en consideración aquellas investigaciones que apuntan a que las escuelas, transformadas en organizaciones que aprenden, ofrecen resultados positivos no solo en los resultados del alumnado, también en la formación de su profesorado. La metodología comprende tres fases definidas: en la primera, con técnicas estadísticas de regresión multinivel se han identificado 44 centros con variación en los logros; en la segunda, se han realizado entrevistas a 39 equipos directivos, 35 responsables de inspección, y se han llevado a cabo 10 grupos de discusión con docentes. Finalmente se ha completado la información con un cuestionario. Los resultados muestran que en todos los centros la formación y desarrollo profesional docente es importante y existe una inversión relevante para su impulso. Sin embargo, cuando la eficacia es más alta, se considera que la formación debe responder a la necesidad colectiva más que a una motivación personal algo que, consecuentemente, revierte en la planificación de un proyecto conjunto con objetivos comunes compartidos. El reconocimiento de la diversidad de necesidades en la dotación de recursos y la identificación de colectivos más vulnerables, se relacionan con el respaldo institucional y las políticas educativas. El trabajo ratifica la necesidad de disponer de unas condiciones básicas (estabilidad del equipo, respaldo administrativo, planificación y gestión) para que las dinámicas que promueven que un centro se transforme en organización que aprende sea una realidad que haga posible el crecimiento profesional y contribuya a la optimización de los resultados del alumnado.

Palabras clave: Formación de profesorado, desarrollo profesional, eficacia del centro de enseñanza, asignación de recursos, integración social

Introduction

This study forms part of the School Effectiveness and Improvement movement, which focuses on researching the conditions, processes and strategies that influence school improvement, understood as 'a series of concurrent, recurring processes through which a school optimises the comprehensive development of each of its students, by increasing the quality of the school itself and its teaching staff' (Murillo & Krichesky, 2015, p.71). This approach views the professional development of teachers as one of the keys to improving teaching quality and student learning and development, placing the locus of change in the school itself in order to generate a true culture of learning. Professional teacher training starts with initial training and continues during both induction (European Commission, 2010) and the rest of the individual's teaching career. This study focuses on in-service teacher training.

During the nineteen-nineties, different methods of assessing improvement plans arose, alongside new professional development proposals, giving rise to new teacher collaboration strategies. From a cultural perspective, emphasis was placed on interactions between innovation and the beliefs and attitudes held by schools and teachers, in accordance with the idea that these attitudes and beliefs play a key role in the configuration of innovation (González-Barbera et al., 2012; Rodríguez-Gómez & Gairín, 2015).

Bolívar (2014) points out that the main characteristics of a learning context are linked to structures that facilitate collective learning focused on student performance, mutual trust, conflict and consensus, and broadening the community to include networks and alliances.

Some authors have shown that leadership is a key factor for organisational learning and the improvement of the system. In this sense, the distributed leadership model seems to be the most conducive to professional learning among teachers (Admiraal et al., 2019). Harris and Jones (2018) also highlight its relationship with teacher leadership, which is characterised by three dimensions: 1) its *influence* on the process of school transformation and educational change, more than a specific role of formal responsibility; 2) as an *action* that goes beyond teachers' formally assigned role in the classroom, prompting them to share practices and bring about change; 3) *excellent pedagogical development*

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inside and outside the classroom, in order to influence the practice of others in both the school and the wider system.

Based on evidence of and implications for school and teaching practice provided by the science of learning and development (Cantor et al., 2018; Darling-Hammond et al., 2018; Osher et al., 2018), Darling-Hammond et al. (2020) identify different practices that should be taken into consideration in teacher training, such as mastery-oriented assessment, the acquisition of metacognitive skills, the development of social, emotional and cognitive skills and habits, educative and restorative approaches to behaviour, integrated school support services, extended learning time, and fostering family-school-community partnerships, among others. For its part, with the aim of promoting innovation in education systems, the World Economic Forum (2020) proposes creating networks for increasing collaboration between leaders.

In an analysis of professional teacher development models and programmes in Spain and other countries, Martín (2015) found that learning communities that engage in collaborative activities were scarce in the Spanish education system. This lack, she argues, is a limitation both in terms of teacher training activities and in relation to the overall model of professional teacher development, and what is required is increased investment in the implementation of improvements and a legal framework that regulates the teachers' statute and the training of recently-qualified teachers.

Other studies carried out in Spain highlight the importance of providing reflexive teacher training throughout teachers' entire careers (González Calvo & Barba, 2014), incorporating students' voices (Ceballos-López et al., 2019; Susinos & Haya, 2014) and focusing on teacher engagement in *lesson study*, with results indicating that this fosters reflexive processes among teachers, aimed at transforming and improving teaching practice (Escudero et al, 2018; Peña, 2012; Saiz-Linares et al., 2019; Simón et al., 2018). According to García Bravo and Martín Sánchez (2013), of particular importance also is the idea of enhancing teaching expertise through shared reflexion on praxis. Here, the concept of teacher training encompasses the principles, processes and meanings that underpin teachers' behaviour. Expertise becomes a discourse which explains and questions educational practice through verbal expression. This discourse can be very diverse, pertaining to a specific situation through multiple

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different dimensions that are reconstructed throughout a teacher's entire professional career.

■ Teacher training models

Two complementary models have emerged for enhancing teachers' level of professionalism: expert-led lifelong learning and in-school training programmes (Imbernón, 2019). The former is based on formal, official training organised and supported by stakeholders outside the school, while the latter is more informal and systematic, and takes place within the school itself (Escudero, 2017). Nieto and Alfageme-González (2017) propose a classification of different types of lifelong learning based on two main categories: individual technical training (talks, conferences, workshops, online courses, etc.), and collegial professional development (coaching, peer observation, shared teaching, school visits, work groups, cooperative action research, professional communities and professional networks, etc.). These models can be further divided into two main types of training method: elements linked to the training structure-context (format, duration, participation, place, leadership) and elements associated with the process-content of the training (design, consistency, learning case, contents and processes).

In the 2018 TALIS report (Spanish Ministry of Education and Vocational Training, 2019), the different types of lifelong learning for teachers were subdivided into formally structured activities (talks, workshops, formal qualification programmes) and informal activities (networking, collaboration between colleagues, reading academic papers, etc.). According to this report, primary teachers' participation in professional development activities (95%) was slightly higher than their counterparts in secondary (92%). Of the different types of activity, the most common among teachers are face-to-face courses or seminars. Regarding professional development activities that take place inside the school itself, primary teachers participate more than secondary teachers in both tutorials and/or peer observation (as part of formal school programmes), as well as in teaching networks set up specifically to foster teachers' professional development. The professional training area highlighted most often by management teams is that linked to fostering collaborative work among teachers. Both management teams and primary and secondary teachers themselves coincide in underscoring

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the following aspects that hamper training: lack of incentives, timetable clashes and family responsibilities.

Much headway has been made recently in this field, in terms of both research and practice (Borko et al., 2010). Rather than focusing on occasional activities, greater importance is now attached to professional development closely linked to teachers' everyday professional practice, supported by the school itself and the school leadership (which is participatory and distributed). Based on the work of Guskey (2002), Escudero (2017, p. 6) identifies the following dimensions of lifelong learning: Political structures regarding teaching staff and lifelong learning; Components of the training; Organisation, support and stakeholders; Impact on teachers and teaching; and Impact on students and their learning. As part of the move to turn schools into learning organisations, Estebaranz (2017) argues that improving implies fostering collaborative practices among teachers. Moreover, the participation of schools themselves in networks has an impact on improvement and innovation (Susinos et al., 2019). According to Azorín and Mujis (2018), the weak culture of collaboration and ineffective governmental mechanisms, which serve to separate professional and social capital, hamper these processes.

- Teacher training in the Autonomous Community of the Basque Country (ACBC)

The Basque Regional Government's Department of Education prioritises in-school teacher training based on a diagnosis of real needs and situations, accompanied by innovation processes in which reflexion and the exchange of learning and experiences by teachers are seen as the key to improving student learning. The Department also emphasises the importance of assessing training processes, in order to identify their impact on different areas of school life. To this end, it offers schools different types of training programmes. Although some were originally oriented towards individual training, the Prest Gara programme (implemented during the 2014-2015 academic year) today offers a training proposal open to the entire educational community, which focuses on the whole school with the aim of ensuring the acquisition of competencies by students.

It is important to highlight the increase over recent years in the number of programmes which seek to facilitate experience exchange, the analysis of practice and the search for shared solutions focused either

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on the school itself (training and innovation programmes) or on training centres or participation in school networks. All concentrate their efforts on encouraging teachers to think together about their practice, as a means of changing the way they teach in the classroom. The report published by Mckinsey & Company (2007) highlights the need to prioritise certain interventions in schools in accordance with their level (poor-acceptable, acceptable-good, good-very good, very good-excellent). At the first two levels, greater importance is attached to the need to provide teachers with pedagogical support and help them identify areas for improvement based on an analysis of student outcomes. At the second two levels, the key issue is the professionalisation of teaching staff. The aim is to encourage fidelity to certain teaching styles, and to foster decentralised, school-led training models, using methods such as peer training and inter-school training. Teachers should be offered the opportunity to specialise and develop professionally, and more highly-qualified teachers should be able to dedicate part of their working day to innovation and expert activities (Gobierno Vasco-Basque Government 2015, 2020). The study cited earlier (ISE-IVEI, 2015) warns that, according to the PISA 2012 results, schools in the ACBC are mainly at the second and third level.

There is therefore a need to implement training programmes based on collaborative practices which include reduced working hours, greater recognition, incentives and professional career opportunities for expert teachers, who can help guide their colleagues while at the same time fostering an exchange of expert professionals among schools. These measures should be accompanied by greater financial and pedagogical autonomy for professionals working at the school. Lizasoain et al. (2016) observed that, in the highly-effective schools of the ACBC, teachers were very committed to and involved in their task. Training is systemised, based on a set of clearly identified needs and characterised by being mainly collaborative and carried out in schools themselves.

Within this framework, the general aim of this study is to compare interventions aimed at facilitating the professional development of teachers in schools with high (HE) and low (LE) levels of effectiveness in the ACBC. The specific aims of the study are as follows:

- To compare teachers' views regarding training and professional development in both types of school.

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- To describe how the management teams, inspectors and teachers working in schools with high and low effectiveness levels perceive the types of training and professional development activities carried out.

Method

The methodology comprised 3 phases. In the first phase, the schools were selected using a statistical method (multilevel regression techniques); in the second, information pertaining to school improvement was gathered by means of a questionnaire designed for and completed by teachers; and in the third phase, the information was triangulated, using qualitative data gathering techniques including interviews with management teams and inspectors and discussion groups with teachers working at the selected schools.

Sample

The study covers the entire population, since all schools with more than one class per year in the ACBC education network were taken into consideration.

The results obtained across 5 Diagnostic Analyses (DAs) were analysed, and schools were divided into groups on the basis of a set of clearly defined criteria. The criteria and statistical models used took the results of the mathematics, reading comprehension in Spanish and reading comprehension in Basque DA tests as the criterion variable (Lizasoain, 2020). Although in the broader study four school effectiveness criteria are defined, in the present study we analyse the information relating to just two of them: increase (or decrease) in residual values, and consistency (high or low) of extreme residuals. This is because the aim of the study was to describe and compare schools with very high and very low residuals. Multilevel regression techniques with linear hierarchical models (Joaristi et al., 2014) were used to statistically identify the scores obtained each year and in each subject by schools with similar characteristics, after first controlling for the effect of contextual variables.

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The levels and variables were, at level 1: student's sex, language model and economic, social and cultural status (ESCS); whether or not they are an immigrant recently incorporated into the education system; whether or not Basque is the family language spoken at home; whether or not they are in the academic year corresponding to their age; and performance during the previous academic year in each competency evaluated by the Diagnostic Assessment.

At level 2 (schools) the variables were: public or semi-private school; size (number of students); average economic, social and cultural status (ESCS) of attending families; proportion of students who are immigrants recently incorporated into the education system; proportion of students for whom Basque is the family language spoken at home; proportion of students who are in the academic year corresponding to their age; and mean performance level obtained during the previous academic year in each competency evaluated by the Diagnostic Assessment (DA).

TABLE I. Schools selected in accordance with the two criteria studied. Participating schools selected in accordance with the two effectiveness criteria studied

N=39	PRIMARY EDUCATION		COMPULSORY SECONDARY EDUCATION		TOTAL	
	HE	LE	HE	LE	HE	LE
EXTREME RESIDUALS (HIGH AND LOW)	3	4	4	2	7	6
INCREASE AND DECREASE OF RESIDUALS	8	8	6	4	14	12
TOTAL	11	12	10	6	21	18

Semi-structured interviews were held with the management teams of all 39 schools and the 35 education inspectors assigned to them. Teachers from the schools participated in discussion groups (10 teacher groups).

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Instruments

The questionnaire

The questionnaire was designed to gather information about the selected schools from the perspective of the teachers working there. In addition to one open-ended question, the instrument comprised 99 items focusing on the characteristics that define informants' teaching activities and aspects that have been found in previous studies to be linked to school effectiveness and school improvement.

The present study analyses the 14 items that were directly related to teacher training.

Interviews and discussion groups

The contents to be discussed were established in accordance with previous information (interview script), and an action protocol was established (informed consent, researcher roles, location maps, etc.). All conversations were recorded, transcribed and analysed.

Procedure

The statistical analyses carried out identified schools with variability in their residuals; in these schools, the results obtained deviate from the expected mean for schools with similar characteristics. The aim was to analyse and compare the type of teacher training provided in the schools in accordance with their effectiveness level (high or low). Next, a questionnaire was developed, tested and modified, and then administered to the selected schools.

The aim of the interviews was to explore aspects linked to school effectiveness and the longitudinal variability identified in some of them. A total of 14 pedagogical dimensions were analysed, divided into 9 categories or units of analysis. In the present study, we focus on those categories that either directly or indirectly provide relevant information about teacher training. All interviews were recorded, transcribed and categorised (N-vivo 10). This was initially done in accordance with the classic units of analysis associated with school improvement. To enable a more in-depth interpretation of the teacher training provided, a second categorisation was carried out in accordance with the results reported by

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previous studies offering the technical guarantees necessary to support their findings.

The following is a description of the categorisation of contents linked to teacher training which were included in the dimension 'Training and innovation projects'. Innovation projects are a series of refresher and transformation initiatives carried out in schools in response to the needs emerging from the social environment. They include training plans, which are a varied set of learning and professional development actions implemented with the aim of improving students' educational processes. They encompass the following subunits: 1) Training management processes; 2) Training dissemination (types and tasks); 3) Training assessment and transfer; and 4) Conditions and context (Admiraal et al., 2019).

Finally, the quantitative data were analysed using the SPSS 24.0 software package to obtain the descriptive statistics (means and standard deviations). The *Kolmogorov-Smirnov* test was performed to verify the distribution of the data and the non-parametric *Mann-Whitney U* test for two independent samples was used to compare the data in accordance with effectiveness level (high or low). The *NVIVO 10* software was used to analyse the qualitative data, distributing the information across nodes or categories and analysing and comparing it using matrix coding queries.

Results

– Differences between HE and LE schools in terms of how teachers view training and professional development

As shown in Table II, significant differences were found in terms of how teachers from HE and LE viewed training and professional development. Specifically, teachers from HE schools tended to participate more in *training design* (*M* (*SD*) = 6.05 (2.24) vs 5.35 (2.68); Z = -2.330; p = .020), *training in gender equality* (*M* (SD) = 6.59 (2.91) vs 5.59 (2.76); Z = -4.423; p = .000) and *the management and organisation of the school* (*M* (*SD*) =6.98 (2.32) vs 5.79 (2.64); Z = -4.796; p = .000) than their counterparts from LE schools. No significant differences were found in any of the other areas analysed.

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TABLE II. Differences between teachers from HE and LE schools

	HE	LE	*Z*	*P*
	M (SD)	*M (SD)*		
My school's training actions are designed in accordance with a previous assessment of real needs	7.26 (1.97)	6.83 (2.43)	-1.368	.171
The training actions are evaluated	6.90 (2.33)	6.65 (2.64)	-.575	.566
The training received is put into practice	7.00 (1.99)	6.68 (2.51)	-.702	.482
Teachers have a positive attitude to training actions	7.00 (1.99)	6.68 (2.51)	-.676	.499
Teachers participate in the design of the training actions	6.05 (2.24)	5.35 (2.67)	-2.330	**.020***
Teachers have the opportunity to receive training in those areas in which they most need it	6.84 (2.31)	6.67 (1.62)	-.182	.855
Teachers participate in gender equality training	(6.59) (2.91)	(5.59) 2.75).	-4.423	**.000***
Teachers are evaluated at my school	(5.31) (3.05)	(5.79) (2.98)	-1.632	.103
New teachers are provided with orientation and support in their teaching activities	(7.75) (2.04)	(7.46) (2.56)	-.509	.611
Teachers participate in the management and organisation of the school	(6.98) (2.32)	(5.79) (2.64)	-4.796	**.000***
The management team seeks to foster teachers' leadership skills	(6.51) (2.44)	(6.47) (2.71)	-.442	.659
The specific training I have received is sufficient to enable me to cope with the challenges of conflict management at my school	(6.48) (2.17)	(6.40) (2.54)	-.066	.947
The educational community is aware of and agrees with the values that my school aims to promote, and puts them into practice.	(7.61) (2.06)	(7.14) (2.81)	-667	.505
My school collaborates with other groups and associations in its local environment	(7.36) (2.25)	(7.20) (2.60)	-108	.914

Below, we present and analyse the overall qualitative results pertaining to teachers, management teams and inspectors.

- Professional development of teachers in HE and LE schools.
  - Schools with a high extreme residual.

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In relation to the *management of training and innovation*, these schools claim to start with an assessment of training needs, the results of which are incorporated into their annual plan. These needs are sometimes associated with individual criteria, while in other cases they are proposed by management and ratified by faculty. Next, priorities are established in accordance with the improvement plan.

The planning of training actions is governed by the school's annual plan and, in some cases, by the quality management system, which facilitates organisation and systematisation.

Training actions focus on co-education, multilingualism and language normalisation, cooperative learning, conflict resolution, ICT, active teaching methods, artistic education, environmental education, diversity, exchange programmes such as Comenius and Erasmus+, and specific training in school management.

As regards the *dissemination of training*, courses mainly take the form of lectures, although other methods are also emerging, such as tutored research-action, in-school lifelong learning (i.e., a small group of trained teachers train larger groups) and inter-school training. Participants highlighted the importance attached to educational networks, which they consider to be key sources of support for guiding training actions.

They also underscored the importance of family training and said they had active parent training plans.

In relation to the *assessment and transfer of learning*, participants said they apply the knowledge acquired in the classroom, design material adapted to their specific context and assess training and innovation plans, including those involving students and families.

In connection with *contextual conditions*, participants highlighted the importance of coordination structures and decisive management in order to make it easier for teachers to participate in the different training initiatives on offer. The management teams and inspectors coincided in stressing the importance of a stable core group of teachers with a positive attitude towards and firm commitment to continuous improvement. These teachers help promote different initiatives and give the school its identity.

– Schools with a low extreme residual.

In relation to the *management of training and innovation*, training content in these schools depends on the interest and engagement of individual teachers, or the management team's reaction to the results

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of the Diagnostic Assessments; they are also sometimes prompted to organise school-wide training initiatives by the annual or strategic plans.

As regards the *dissemination of training*, expert-led methods are the most common, although participants also highlighted the need for training to involve the entire school. Special mention was made of certain training initiatives, such as inter-school training, the organisation of a best practice day at the end of the academic year, and participation in different calls, such as the Innovative Classrooms programme.

The schools in this group said they make an effort to train new teachers. However, teachers' tendency to stick to their own teaching style hampers internal community learning.

In relation to the *assessment and transfer of learning*, participants said that, in some cases, the assessment mechanisms were those required by their quality management systems, and were used to identify training needs.

In terms of *contextual conditions*, many schools in this group said they had implemented a quality system inspired by the process-based management model, which fostered more distributed leadership and greater systematisation of tasks and functions. The scarcity of financial resources made collegial training difficult, and meant that it was not always possible to provide substitute teachers for those on training courses. As a result, teachers sometimes had to engage in training activities outside working hours. They considered it of vital importance to have engaged teachers organised into stable groups for working on projects.

– Schools whose residuals increased.

In relation to the *management of training and innovation*, training and innovation projects were present in most schools in this group, and most also said they organise training activities both inside and outside working hours, at the start and during the course of the academic year. Participants stated that training areas were defined on the basis of real needs, and that training contents and timetables were planned in accordance with those needs. Some schools linked training and innovation to improvement plans and the results of the Diagnostic Assessments.

The innovation projects in which they participate include language initiatives, Agenda 21, language normalisation and Hauspoa (improvement of the internal organisation of public schools working in compulsory secondary education).

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It is worth noting that half of these schools are engaged in co-education and prevention of gender violence plans, in some cases through programmes run by Emakunde-the Basque Equality Institute (Nahiko) and in others on their own initiative.

The contents of teacher training actions are very diverse: oral language, peer reading, reading-writing, graphomotor skills and comprehension reading; cooperative learning; scientific education; languages within the trilingual programme; co-education and gender equality; ICT within the Sare Hezkuntza programme; pedagogy of trust; refreshing attitudes; values education (grief, emotional competence); Golden 5; prevention of bullying; quality; Bikaintasunerantz (Towards Excellence); Bidelaguna (afternoon extracurricular and educational support); ACEX and Lagunbusa (supervised independent walking to school).

In some cases, they also mentioned the training of management teams through monthly seminars targeted specifically at new head teachers. Training contents include: ICT, conflict resolution and student rights.

Half of the schools in this group have a new teacher orientation and mentoring protocol, in which the internal working of the school is clearly defined (meetings, material, substitutions, agenda, notes, code of conduct).

Another practice worth highlighting is that of providing teachers with feedback on the classroom observations carried out by inspectors:

> *This intervention is more difficult, but it is very useful in terms of improvement. I go into their classroom but I give them immediate feedback on what I see, pointing out weaknesses and but also strengths they should try to maintain. From 2012-2013 I wrote feedback reports. I went, I spent a lot of time in different classrooms and I engaged in many observations, in the playground too. (Inspector 25080)*

As regards the *dissemination of the training*, participants from public schools said that the organisation mainly responsible for disseminating training activities is Berritzegune, while those from semi-private schools highlighted the networks to which they belong. Schools had a positive view of the training and materials provided by their networks.

Some training sessions are targeted at all teaching staff, whereas on other occasions a few selected teachers are trained, and are then responsible for training their colleagues in turn. Occasionally, training is

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provided to both teaching and non-teaching staff. One school highlighted network-based dissemination:

> *In secondary education, no teacher teaches alone, there is never just one teacher at any given level; everyone always has at least one colleague. And everyone's timetable includes a period of weekly coordination. All teachers need to share with other teachers. So, a network is set up. If one of them attends a seminar, they share what they have learned with the others. (Management Team 36586)*

Other schools have ongoing internal training schemes or organise an annual pedagogic conference which is open to the local community also, and which features different educational stakeholders (teachers, students, families and inspectors). Participants rated these conferences very highly.

In relation to the *assessment and transfer of training*, participants highlighted the importance of applying the knowledge gained to their practice in the classroom. Nevertheless, they also said that training projects are not generally subject to specific assessment, although there are assessment mechanisms for families and students regarding the general dimensions of the school.

In terms of *contextual conditions*, in relation to leadership, participants claimed to have a good internal organisation with well-defined, systematised functioning. They also said that all functions were performed with a high degree of professionalism. In the majority of the schools in this group, the management team exercises strong leadership, encouraging the participation of the entire educational community (teachers, students and non-teaching staff) in decision-making, and striving always to reach a consensus:

Everyone kind of participates in making the decisions. (Management Team 28644)

Schools that are set up as Learning Communities are characterised by a participatory and cooperative working philosophy; organisational management is the responsibility of committees and all members feel like they are part of a large community.

In relation to resources and administrative support, for these schools, good time management is a priority and they attach a great deal of importance to training and coordination, always striving to make the best possible use of the time available. Thanks to their good pedagogical management and the coordination work carried out by the management

team, they are able to dedicate a large part of their individual work to internal coordination (parallel, vertical, management team).

In relation to climate, most participants from these schools coincided in highlighting the feeling of belonging to the school, and the engagement and commitment of the teaching staff. They make a concerted effort to have a common project and to maintain a sense of cohesion among the teaching staff. Participants also said that teachers' own reflexions on student outcomes have generated a desire to improve and a willingness to innovate.

Teachers generally have a positive attitude towards training and are willing to participate, particularly when they see that the theoretical and practical contents are useful for their work in the classroom.

– Schools whose residuals decreased.

In relation to the *management of training and innovation*, participants in this group said that training processes are oriented towards both teachers and the management team, and even sometimes families also. The innovation projects in which they are involved include Agenda 21, the language normalisation project and specific language initiatives.

The contents addressed during training sessions are based on the specific needs of each school and include: cooperative learning; ICT (Aukera project, Eskola 2.0); psychomotor skills; language acquisition; conflict resolution; pedagogy of trust; emotional education; co-education and teaching from the gender perspective; the Bikaintasunerantz (Towards Excellence) programme, Silver Q (EFQM) and extracurricular activities.

As regards the *dissemination of training*, most of the training participants in this group receive is provided by the specific network of schools to which they belong (Kristau Eskola, Ikastola network).

Some schools mentioned that they had improved their training dissemination system.

> *Before, the training plan pivoted on a single person, who was responsible for running the session. But now, we have set up a team and everyone focuses on a specific topic and we take it in turns to run sessions. (Management Team 32120)*

In relation to the *assessment and transfer of learning*, although in general teacher training is not assessed, or no feedback is provided, in some cases it is evaluated in terms of goal achievement:

Some training actions are assessed in terms of goal achievement. If the goal of the action is to enable a project...I mean, if teachers are being training for a specific project, then if the project is carried out, the action is assessed positively. (Management Team 27038)

As regards the transfer of learning, participants stressed that theory is all well and good, but the situations they face in their classrooms are so complex that they are rarely able to apply the knowledge acquired, and the training received does not often result in changes in their everyday practice.

In terms of *contextual conditions*, and specifically leadership, half of the schools in this group claimed to have a directive leadership style and the other half a shared leadership style. Management difficulties mentioned by the management teams from schools whose residuals had decreased are: 1) difficulty developing a management model that really works and goes beyond mere coordination; 2) difficulty moving from one to two classes per year group, without this having a detrimental effect on relations among teachers; 3) difficulty switching from a content-based model to a competence-based one, and changing methodologies and assessment systems; 4) students have also changed, for example, constant screen use makes it harder for them to remain focused; 5) difficulty managing emotional conflicts (with teachers, families, students, the local council); dealing with families is particularly difficult in this sense; 6) excessive working hours with no financial recompense for teachers; an effort is made to thank them and reward their efforts in other ways, but it is still sometimes a problem; and 7) difficulty implementing action plans; often they try to do many new things, but are not sure what works and what does not.

In relation to resources (functional, material and personal) and administrative support, participants stated that, in their schools, financial management has been affected by cutbacks, which they see as having contributed to the poor results obtained in the DAs. Moreover, in the case some public schools, participants mentioned the high percentage of immigrant students and the high level of teacher turnover. Participants from other schools highlighted other aspects that are not assessed, such as values and methodological changes that are being implemented gradually and which require a great deal of time and effort.

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Some participants also mentioned work overload, referring specifically to long working hours and the difficulties, tensions and conflicts anyone assuming a leadership role must face:

> *No one wants to be the head, the coordinator, or anything at all. (Management Team 27038)*

In relation to climate, participants from some schools pointed out that many changes have taken place over recent years (shift from a content-based to a competence-based model, incorporation of ICT, changes in methodology and assessment system). This is hard, because everyone is trained in and is used to a certain way of working, and change often generates fear and resistance. Teachers feel judged and some families demand a way of working that does not coincide with the new pedagogical approaches currently being implemented.

In schools whose residuals follow a downwards trend, participants convey a more negative view of their experiences, not only in relation to new learning (new technologies or new programmes), but also in connection with learning that has already been acquired (for example, the Basque language).

Moreover, participants from some schools claimed that some members of the teaching staff are pessimistic about these changes and unsure of their effectiveness.

Conclusions

Through an exhaustive analysis of the opinions expressed by key informants (management teams, inspectors and teachers), this study provides a detailed overview of teacher training and professional development in schools located in the ACBC, in accordance with their level of school effectiveness, analysing aspects related to both the structure-context and process-content of the training provided (Nieto & Alfageme-González, 2017).

The results indicate that school effectiveness is supported by teacher training when teachers' participation is significant throughout the entire training sequence designed to promote their professional development. Both the quantitative and the qualitative information gathered and analysed confirm the importance of a shared identification of training

needs and a training plan that is linked to an overall vision of the group and enjoys a certain degree of stability in terms of both duration and organisational structure. It seems that if, when teachers detect a specific training need, that need is then shared with the group, accepted and approved by the school, included in a concrete plan, allocated the necessary resources and provided in a favourable climate, then what is learned by those receiving the training is then applied and implemented. Specifically, the results reveal that teachers from more effective schools participate more than their counterparts from less effective ones in the design of the training actions, particularly in relation to gender equality training and school management and organisation.

The different training types and models described by informants indicate that, in general, the most common are training courses (Ministerio de Educación y Formación Profesional-Spanish Ministry of Education and Vocational Training, 2019), although other more participatory and reflexive models are also emerging (research-action, internal ongoing in-school training, educational networks, etc.). This is consistent with what the education authorities in the ACBC are trying to promote (Gobierno Vasco-Basque Regional Government, 2015, 2020), as well as with that reported by other studies (Saiz-Linares et al., 2019; Simón et al., 2018), although it is also true that these models are more common in schools with high effectiveness levels than in their less effective counterparts. Highly-effective schools strive to include the entire educational community in the training actions and their assessment (Lizasoain et al., 2016), something which involves distributed, participatory leadership. As stated by the 2018 TALIS report (Ministerio de Educación y Formación Profesional-Spanish Ministry of Education and Vocational Training, 2019), this may explain why the professional training area most often highlighted by management teams is that linked to fostering collaborative work among teachers.

Teachers working in highly-effective schools have more opportunities to apply the training received in the classroom, whereas those working schools whose residuals follow a downwards trend allude to contextual difficulties, as well as difficulties linked to management and resources (functional, material and personal) that often prevent them from transferring what they have learned to their practice in the classroom.

The results obtained in this study regarding contextual conditions are consistent with those reported previously (Admiraal et al., 2019)

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in relation to the influence of school context on teachers' professional learning, and highlight aspects such as time scheduled for professional learning, support from colleagues and their availability, quality of the supervision of learning processes, resource accessibility, monitoring and assessment of teachers' professional learning, administrative support and educational leadership. Decentralisation, manifested here as institutional and teacher autonomy, is a prerequisite for talking about how organisations learn and improve (Rodríguez-Gómez & Gairín, 2015). Highly-effective schools recognise the main dimensions of schools as learning organisations more clearly than their less effective counterparts (Stoll & Kools, 2017). These dimensions are: 1) Developing and sharing a vision centred on learning; 2) Creating and supporting continuous learning opportunities for all staff; 3) Promoting team learning and collaboration among staff; 4) Establishing a culture of inquiry, innovation and exploration; 5) Establishing embedded systems for collecting and exchanging knowledge and learning; 6) Learning with and from the external environment; and 7) Modelling and growing learning leadership.

Schools with poorer results are obliged to respond to more basic immediate demands, which prevent the establishment of the conditions required to activate mechanisms enabling them to become learning organisations. Responses tend to be linked to individual concerns, outside common projects, the climate is more prone to tension, and there is an overriding feeling of having insufficient resources, coupled with a lack of group cohesion and high teacher turnover.

One of the limitations of this study is that less information was gathered from inspectors and teachers than from management teams. Moreover, the teachers from some schools did not participate, meaning that discussion groups were not held at all schools. It is also important to point out that criteria for selecting the schools were based on the results obtained in the basic instrumental competencies measured by the DAs. This is inevitably a partial approach, since the educational activity of any school goes well beyond mere instructional aspects.

In addition to the factors and processes analysed here, future research may also wish to explore to what extent (within teacher training and professional development initiatives) participation in training actions focused on gender equality are associated with school improvement and effectiveness. It is striking that schools with extreme residuals mentioned nothing about this, whereas those with increasing and decreasing

residuals did. Finally, given that teacher training and professional development interventions linked to school effectiveness levels are mediated by leadership style, future research may wish to explore these aspects in more detail.

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Strengthening teaching competencies in Early Childhood Education: an insight into classroom activities

Reforzar las competencias docentes en Educación Infantil: una mirada desde las actividades del aula

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Abstract

Introduction: the increase in the offer of places in Early Childhood Education (ECE) after the adoption of the new Education Law (LOMLOE, 2020) must entail a commitment to improve quality, and one of the pillars on which it is based is the teaching competence of its teachers. The present study analyzes teaching performance in the development of learning activities in the first cycle of ECE, based on the type of the most frequent activities observed in classrooms from 0 to 3 years old. The results of the study do not make inferences about the initial training received by the participating teachers, but it will raise questions contributing to the review and improvement of the training, especially in its practical aspect. Methodology: a systematic observation is carried out using the ITERS-3 (Infant/Toddler Environment Rating Scale, third edition) in an incidental sample of 31 classrooms from 21 ECE centres (0-3 years old) in 4 Spanish Autonomous Communities, with a total of 340 students and 58 teachers. Results: Data shows that the subscale "Activities" receives the lowest score, showing statistically significant differences when compared to the other subscales (Space and Furnishings, Personal Care Routines, Language and Books, Interaction and Program Structure). The mentioned subscale does not reach the minimum level of quality in 8 of the 10 items proposed by the scale: fine motor, arts, music and movement, blocks, dramatic play, nature/science, math/number and acceptance

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of diversity promotion. "Appropriate use of technology" and "Gross Motor" items reach a minimum and good score respectively. Discussion: these results invite to rethink teachers' training in respect to children's education in Spain.

Key words: class activities, early childhood education, initial training, ITERS (Infant/Toddler Environment Rating Scale), preschool teacher, quality of education, teacher education.

Resumen

Introducción: el aumento en la oferta de plazas en Educación Infantil (EI)tras la aprobación de la nueva Ley de Educación (LOMLOE, 2020) debe conllevar una apuesta por mejorar la calidad, y uno de los pilares en los que ésta se sustenta es la competencia docente de su profesorado. El estudio que se presenta analiza el desempeño docente en el desarrollo de actividades de aprendizaje en el primer ciclo de EI, a partir del tipo de actividades más frecuentes observadas en las aulas de 0 a 3 años. De los resultados del estudio no se hacen inferencias sobre formación inicial recibida por los docentes que han participado, pero si plantearán interrogantes que contribuyan a la revisión y mejora de la formación, muy especialmente en su vertiente práctica. Metodología: se realiza una observación sistemática empleando la escala ITERS-3 (Infant/Toddler Environment Rating Scale, third edition) en una muestra incidental de 31 aulas de 21 centros que imparten el primer ciclo de EI en 4 Comunidades Autónomas españolas, con un total de 340 alumnos/as y 58 maestros/as/as. Resultados: los datos muestran que la subescala "Actividades" es la que menor puntuación ha recibido, mostrando diferencias estadísticamente significativas respecto al resto de subescalas (Espacio y muebles, Rutinas de cuidado personal, Lenguaje y libros, Interacción y Estructura del programa). Dentro de dicha subescala, no se alcanza el nivel mínimo de calidad en 8 de los 10 ítems propuestas por la escala: motricidad fina, arte, música y movimiento, bloques, juego dramático, naturaleza y ciencias, matemáticas y números, y aceptación de la diversidad. En los ítems "Uso apropiado de la tecnología" y "Motricidad gruesa" se alcanza una puntuación mínima y buena respectivamente. Discusión: estos resultados invitan a repensar la formación del profesorado de EI en España.

Palabras clave: actividades de aula, ambiente de la clase, calidad de la educación, Educación Infantil, docente de preescolar, formación de docentes de preescolar, ITERS (Infant/Toddler Environment Rating Scale).

Introduction

In current national and international education policies, meeting the demand for accessible and affordable places in the first cycle of Early Childhood Education (OECD, 2020) is a very present objective. In the Spanish case, the (Organic Law) Ley Orgánica 3/2020, de 29 de diciembre, por la que se modifica la Ley Orgánica 2/2006, del 3 de mayo, de Educación (LOMLOE), considers this progress in the additional 24 Provision: "The General Budgets of the State (...) progressively incorporate the necessary appropriations to implement the gratuity in the first cycle of early childhood education referred to in Article 15(2)." Also in the 3 additional provision, it states that "within one year of the entry into force of this Law, the Government, in collaboration with the Educational Authorities, shall draw up an eight-year plan for the extension of the first cycle of early childhood education in such a way as to move towards a sufficient and affordable public offering with equity and quality and to ensure its educational character". The new Law provides for equity in access and quality of processes, taking up the educational nature of the first cycle of Early Childhood Education, which the previous Law (LOMCE, 2013) had eliminated. In this sense, the incorporation of a general principle of quality control is an important step forward: Article 15.1.: "... All centres must be authorized and supervised by the relevant Educational Administration." This purpose coincides with Objective 4.2 of UNESCO's Sustainable Development Goals which states that, by 2030, all children shall have access to quality early childhood care and development services and preschool education. Such a statement places this goal in the International Agenda.

The importance of quality education at this stage, and its short-, medium- and long-term impact on development and learning, well-being, early abandonment rate reduction or increased life expectancy, is widely argued by numerous international authors and agencies (Blanco, 2008; Guijo, 2008; Heckman, 2017; OCDE, 2019a; UNICEF, 2019, among others).

In Spain, as in most OECD countries, teachers in the first ECE cycle must have a Degree in Child Education (ISCED 6) or the title of Technician in Child Education (ISCED 5). In Germany and Norway, 70% and 50% of the teachers in the first cycle have university education (ISCED 6 or higher) respectively.

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More recently, the TALIS 2018 Report (OECD, 2019b) notes that the increase or improvement in quality in ECE is influenced by the increase in the teachers' training level. Teachers who have a university degree or higher studies tend to create more enriching learning environments and perform more stimulating activities -European Commission-, (Comisión Europea, 2019). Also, in the Quality Framework for Early Childhood Education and Care (Diario Oficial de la Unión Europea, 2019), initial teacher training is one of the 5 components needed to create a quality child education system. This statement is in line with the meta-analysis elaborated by Manning, Wong, Fleming and Garvis (2019), which shows a positive correlation between teachers' training level and the quality of child educational programs. It includes the studies from 1980 to 2015 which analyze the qualification of the teacher in relation to the evaluation of the quality of the environment in the classroom through the scales: ECERS, ECERS-R, ITERS e ITERS-R. In any case, the adequacy of this training remains a matter of concern and debate. Already in 2009, a report from the School Council of the Spanish State (Consejo Escolar del Estado, 2009) showed a mismatch between its "too theoretical approach" and the subsequent educational practice. Certainly, the key to boost teacher professional development is to identify the most appropriate strategies to help these professionals stay up-to-date on the most suitable pedagogical methods at this stage (Peterson et al., 2016). In the context of structural reforms promoted by the new Law (LOMLOE, 2020) - which reaches the teaching profession - it is important to review whether the standards governing the Degree of Teaching in Child Education responds to the challenges these teachers will have to face in schools.

The current study analyzes the teaching performance in the design and development of learning activities in the first cycle of ECE, based on the type of most frequent activities in classrooms from 0 to 3 years old. This is not intended, nor is it possible, to make an inference from the results of the study to the initial training received by the teachers who have participated, but to raise questions that contribute to the review and improvement of the initial training, especially in its practical aspect.

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Initial Training of Early Childhood Education Teachers in Spanish universities

The regulation of the Degree of Teaching in Early Childhood Education is governed by -ORDER- ORDENECI/3854/2007, del 27 de diciembre, which sets out the requirements for the verification of official university degrees for the exercise of the profession of Teacher in Early Childhood Education.

TABLE I. Curriculum of the Bachelor's Degree in Early Childhood Education

Module	Number of European credits
Basic training Educational processes, learning and personality development (0-6 years old). Learning difficulties and developmental disorders Society, family and school. Childhood, health and food. Organization of school space, teaching materials and skills. Systematic observation and context analysis. The Children's Education School.	100
Disciplinary didactics Learning the Sciences of Nature, Social Sciences and Mathematics. Language Learning and Literacy Music, arts and body expression	60
Practicum School internships, including end-of-grade work	50

Source: own elaboration from the ORDEN ECI/3854/2007, del 27 de diciembre

This degree is widely supplied and demanded and has a high employability rate. According to the Ministry of Science, Innovation and Universities (MCIU, 2020a), in the 20/21 academic year, the number of universities offering the Degree in Early Childhood Education in Spain is 109 (77 public and 32 private). According to data from the -Ministry of Education and Vocational Training- Ministerio de Educación y Formación Profesional (MEyFP, 2020a), Spain has 56,731 in-service teachers in children's education centres, 48,092 students enrolled in the Degree and 10.153 students have graduated this academic year (MCIU, 2020b). In

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2018, the 2013/14 promotion has an employability rate of more than 75% (MCIU, 2020c).

On the other hand, the increase of the enrolment in the first cycle of this stage is remarkable. In 2018, 26% of children under the age of 3 were schooled in early childhood education in OECD countries (OCDE, 2020). In Spain, the schooling rate in the first ECE cycle has doubled in the last 10 years, reaching 60% for those over 2 years old (MEyPF, 2020b).

The central role of the quality of teaching and learning activities in the ECE stage

According to the Spanish Education Law (LOMLOE, 2020), learning activities are one of the main axes that underpin the methodology and the educational process at this stage, and the most important element –along with relationships and the classroom climate– to ensure the principles of child welfare and development. Thus, with regard to the management and pedagogical principles of both cycles of the stage, the LOMLOE establishes in article 14.6: "Working methods in both cycles will be based on emotionally positive learning experiences, activities and play, and will be applied in an environment of affection and trust, to enhance their self-esteem and social integration and the establishment of a safe attachment". Similarly, in paragraph 3, Objectives, of that aforementioned Order ORDEN ECI/3854/2007, del 27 de diciembre, which regulates the required teacher training, it is established that future teachers of Early Childhood Education must acquire a series of competences in order to be able to develop these activities in an adequate manner, through the design and adequacy of learning spaces, reflection on the practices that take place in the classroom, and the promotion of autonomous learning habits in students. As for the European Commission (Comisión Europea, 2019), it stresses that the teacher must plan the most necessary and satisfactory activities at this age, such as playing, running, singing, dancing, caring for plants, exploring and listening to stories for, among other purposes, "offering them positive learning experiences". The richness and variety of activities – based on well-defined objectives that ensure progress towards the desired learning outcomes, promotes communication between children and teachers and encourage family

participation – as they are an essential element of high-quality education and care (Comisión Europea, 2014).

A great number of research highlights the importance of certain children's activities to lay the foundations of integral development; those that promote inclusion and interculturality (Barreto, Madrona y López (2017), mathematical competence (Clements, 2001; Espinoza, Reyes y Rivas, 2019; Rosales, Ramos, Jáñez y De Sixte, 2020; Watts, Duncan, Clements y Sarama, 2018), the notions of space and time, or creativity (Castro, Barrero y González, 2011; Román y Cardemil, 2014, Sáez-Sánchez, Gil-Madrona y Martínez-López, 2021), among others.

As a result of these approaches, the increase of affordable and accessible places in the first cycle of Early Childhood Education foreseen in the LOMLOE, together with the forthcoming promulgation of a Royal Decree that develops and concretizes its principles in minimum requirements of these teachings guaranteeing their educational function and quality, will require the revision and updating of the curricula of the Teaching Degree in Early Child Education, in order to specially consider the methodologies based on the principles of well-being, activity and integral child development.

Certainly, the improvement of teaching competence is not achieved exclusively by the modification of university curricula, as the available evidence holds. University curricula is still an important link in the chain for quality teaching professional development, which will put on the agenda (social and universities) the debate on what education we want, what education early childhood needs, and what skills should be developed by teachers.

This study aims to contribute to it. Its general objective is to analyze the quality of teaching performance by observing the learning activities carried out in classrooms of the first cycle. Ultimately, the aim is to provide empirical evidence that will contribute to rethinking the initial training of these teachers from the perspective of the well-being and integral development of children under 3 years of age.

Method

The design of this study is quantitative, non-experimental, with a descriptive approach to cross-sectional data. The data analysis plan

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includes descriptive techniques (central trend and dispersion) for the overall results analysis, and inferential techniques for contrast of means.

Sample

Non-probabilistic, accidental or incidental sampling has been carried out for the selection of the centres, due to their accessibility. This type of sampling, which is widely used in the field of social sciences research, does not allow representative samples to be obtained from the population, but enables in-depth study of the topic of interest within a given context (Martínez, 2007). These centres have been accessed by reaching them through an e-mail in which their participation was requested. The sample, obtained in Spain, consists of 31 classrooms from 21 ECE centres, representing a total of 340 children, and 58 teachers. By autonomous communities the sample composition is: 5 classrooms in Andalusia, 4 classrooms in Castilla La Mancha, 5 classrooms in Navarra and 17 classrooms in Madrid. The ownership of the observed centres is 38.7% of public ones, 22.6% of private ones and 38.7% of government funded private centres. The age of children is between 4 months and 34 months old. The average number of children per classroom is 10.91, with 3 students being the lowest-rated classroom and 20 being the highest. With regard to the initial training of teachers and taking the total number of participating teachers, 6,5% have a university master degree, 67.7% have a university degree in Early Childhood Education and 25.8% have a higher degree in Vocational Training. The percentage of classrooms observed by levels is as follows: Classroom Infants (0-1 years old) 9.7%, Classroom 1-2 years old 25.8%, Classroom 2-3 years old 48.4% and Mixed Classroom (in which infants and/or children of different ages are grouped) 16.1%. Most classrooms had two educators (64.5%), followed by only one educator (22.6%). The presence of three teachers per classroom has only occurred in 9.7% of the cases. Finally, we can find a primary teacher and one for specific activities such as music, in 3.2% of the cases. The number of students with special educational needs is anecdotal (N=2). The observation was carried out during the months of October to December 2020.

Research tool
ITERS-3

The ITERS-3 Scale has been selected (Harms, Cryer, Clifford & Yazejian, 2020) -Infant/Toddler Environment Rating Scale, third edition- in its Spanish version. It is a widely used scale given its reliability and validity. The reliability measures provided by the questionnaire are: (1) reliability of the indicator – percentage of ratings matching exactly for each indicator assigned by two independent observers-. The average reliability was 86.9% throughout all the indicators and between pairs of observers, (2) reliability of the item, for which we calculated the concordance at item level between pairs of observers- concordance within the same point of 86.1% and Cohen's Kappa coefficient -0.600-. (3) Intraclass Correlation, in which an average score of 0.83 has been obtained and finally the validity, through an analysis of the internal consistency, with a Cronbach Alpha of 0.914, which leads to a high level of internal consistency (Harms, et al, 2020). The tool is designed to measure the quality of the environment in Early Childhod Education classrooms, from birth to 36 months of age. The scale is composed of 6 subscales: Space and Furnishings (4 items), Personal Care Routines (4 items), Language and Books (6 items), Activities (10 items), Interaction (6 items) and Program Structure (3 items) formed by a total of 33 items. Each item is composed of a series of indicators, resulting in a total of 457 indicators on the global scale. These are organized hierarchically, focusing on basic needs at low levels and on more educational and interactive aspects at the higher levels. They are graded on a scale of 1 to 7 (1 = inadequate, 3 = minimum, 5 = good and 7 = excellent) and their score is eliminatory; if an indicator is valued as negative that item will no longer get a higher score.

This questionnaire and its previous two versions (ITERS and ITERS-R) have been applied in the 5 continents. Table II shows some research in which this tool has been applied over the past 10 years. The search has been conducted in the main databases -Scopus, Web of Science, ERIC, as well as Google Academic, using the word ITERS and the surname of the first author (Harms).

TABLE II. International application of ITERS (2010-2020)

Continent	Country	Author	Year
Africa	South Africa	Biersteker, Dawes, Hendricks & Tredoux	2016
America	USA	Boller et al.	2010
		La Paro, Williamson & Hatfield	2014
		Torquati et al.	2011
	Jamaica	Kinkead-Clark & Escayg	2019
	Chile	Cárcamo, Vermeer, De la Harpe,van der Veer & van Ijzendoor	2014
	Brasil	Evans & Kosec	2012
Asia	Saudi Arabia	Gahwaji	2019
	India	Ramitha & Khadi	2019
	China	Xu, Brooks, Gao &Kitto	2020
Europe	Germany	Eckhardt & Egert	2018
	Greece	Megalonidou	2020
		Rentzou	2010
	Scotland	Bradshaw, Hinchliffe & Scholes	2020
	Spain	Larrea, Lopez de Arana, Barandiaran & Vitoria	2010
	Finland	Kalliala	2011
	Italy	Musatti &Picchio	2010
	Norway	Bjørnestad & Os	2018
		Kaarby & Tandberg	2018
	Netherlands	Helmerhorst, Riksen-Walraven, Fukkink, Tavecchio & Deynoot-Schaub	2017
		Helmerhorst, Riksen-Walraven, Deynoot-Schaub, Tavecchio & Fukkink	2015
	Portugal	Barros & Aguilar	2010
		Barros et al.	2016
Oceania	Australia	Fenech, Sweller & Harrison	2010
		Torr	2019

Source: own elaboration

It should be noted that the study of Larrea et al. (2010) is the first and only to date that to have applied this tool in Spain, specifically in the Basque Country, which contrasts with other countries such as Australia,

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Germany, Scotland, Norway, Portugal or Chile, where the quality of the environment in children's classrooms (0-3) is frequently evaluated with ITERS, and in many cases the Government is the driving force behind these investigations.

The modules that make up the disciplinary didactic training of the current Teaching Curriculum (ORDEN ECI/3854/2007, del 27 de diciembre) are three (1) Natural Sciences, Social Sciences and Mathematics, (2) Language and Literacy and (3) Music, Arts and Body Expression. The ITERS 3 tool, through 6 subscales, allows the collection of information related to these modules, such is the case of the 10 items of the subscale Activities: Fine Motor, Art, Music and Movement, Blocks, Dramatic Play, Nature/Sciences, Math/Numbers, Appropriate Use of Technology, Promoting Acceptance of Diversity and Gross Motor. Or the 6 items of the subscale Language and Books: Talking with children, Encouraging vocabulary development, Responding to children´s communication, Encouraging children to communicate, Staff use of books with children, and Encouraging children´s use books.

Procedure

The administration of the scale requires an observation of three hours in a row that must coincide with the most active part of the day, so it has been done in a schedule between 09:15 and 13:00 h, depending on the organization of each school. The ITERS-3 does not allow for personal interview, and all information reflected in the scale has to be the result of careful observation according to the criteria specified on the scale. Other necessary data, such as teacher training or the ages of children, for example, are requested at the center before the observation begins. The observations have been carried out by a single applicator (principal investigator), who has prepared for observation through repeated and in-depth reading of the manual, where a specific section of "Administration of the scale" is established contributing in this way to its reliability, as well as with the reading of articles in which this scale has been applied, the viewing of explanatory videos on the tool made by the publisher, and the conversation with some experienced applicators in the tool, to know in advance the existence of any possible failure or additional complexity that was not reflected in the scale. It should be noted that the marked

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objectives are of a descriptive rather than diagnostic type and the use of a single applicator reduces possible biases in scores, as well as errors and/or difficulties when comparing them.

Results

After a first exploration of the information coming from the tool with descriptive techniques (central trend and dispersion) inferential techniques for the contrast of means have been used. First, it has been analyzed whether there are differences between the subscales that make up the tool and the significance of those differences. Table III shows the mean scores obtained in the six subscales. As a preliminary step for the analysis of the significance of these differences, compliance with the assumptions of the model for the application of parametric contrast statistics of means has been verified, performing the Shapiro-Wilk normality test. Then, for the subscales that conform to a normal distribution, a Student T-test has been performed and for those that do not, the Wilcoxon sign range test. The *IBM SPSS Statistic version 25* is used for data analysis.

The overall results obtained on the ITERS-3 scale are $\overline{X}$ = 4,81 (σ =,89, minimum value 3,01 and maximum 6.27).Through the descriptive statistics (Table III) it is observed that the subscale Activities is in which a lower score is obtained ($\overline{X}$ =2.59),so the average score in general and specifically in Activities does not reach the minimum (≥3<5), and, however, in the subscale Language and Books a score has been obtained close to the average, with a result of $\overline{X}$ = 4,74, being a very close result compared to that obtained in Space and Furnishing and Care Routines. The average score in the subscale Activities presents statistically significant differences in relation to the rest of subscales, which is why it has been decided to address an in-depth analysis of the items that make up this subscale.

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TABLE III. Statistical descriptions

	N	Mini-mum	Maxi-mum	Mean	Standard Deviation
Mean_Space_Furnishing	31	1,75	7,00	4,6452	1,52449
Mean_Personal_Care	31	2,25	7,00	5,0968	1,20360
Mean_Lenguage_Books	31	2,50	6,67	4,7419	,98492
Mean_Activities	31	1,20	4,67	2,5187	,76632
Mean_Interaction	31	3,17	7,00	6,0323	,89590
Mean_Program_Structure	31	2,67	7,67	5,8387	1,73391

Source: own elaboration

In order to verify whether these differences are statistically significant, a mean contrast test was performed for related samples (Table IV). The results of the Shapiro-Wilk normality test show that all subscales except Interaction and Program Structure conform to a normal distribution (Sig Space and furnishing=0,116; Sig Personal Care Routines= 0,402; Sig Language and books= 0,898; Sig Activities= 0,111; Sig= interaction 0,001; Sig= Program Structure 0,001). Therefore, it can be said that, in all variables except Interaction and Program Structure, we can use parametric tests (Student T). For interaction and structure of the program we must use nonparametric tests (Wilcoxon sign range test). However, interpretative difficulties have been considered due to the observation of coincidental results applying parametric and nonparametric statistics, so it is been decided to offer the results of the Student T test for all scales in the present study.

TABLE IV. Contrast tests of means subscale "Activities" vs others subscales.

		95% confidence interval of the difference							
		Mean	**Deviation**	**Dev. Error**	**Lower**	**Higher**	**T**	**Df**	**Sig. (bilateral)**
Student T test	Space Furnishing	-2,126	1,314	,236	-2,608	-1,644	-9,004	30	,000
	Care Routines	-2,578	1,182	,212	-3,011	-2,144	-12,138	30	,000
	Lenguage & Books	-2,223	,736	,132	-2,493	-1,952	-16,798	30	,000
	Interaction	-3,513	,919	,165	-3,850	-3,17	-21,264	30	,000
	Program Structure	-3,319	1,560	,280	-3,892	-2,747	-11,842	30	,000

Source: own elaboration

These results are reflected in Figure I. It reveals the existence of significant differences between the subscale Activities and the rest of the subscales evaluated, in all cases statistically significant differences are determined.

FIGURE I. Mean score in subscales of the ITERS-3 questionnaire and confidence interval.

Source: own elaboration

Next, we deeply analyze the scores obtained in each of the items that make up this subscale.

TABLE VI. ITERS-3 Activity Results. Statistical descriptions.

	N	Minimum	Maximum	Mean	Deviation	95% mean confidence interval
Fine Motor	31	1	7	2,52	1,895	1,82 3,21
Arts[1]	28	1	7	2,32	1,827	1,61 3,03
Music and Movement	31	1	4	2,16	,779	1,87 2,45
Blocks	31	1	7	1,97	1,741	1,33 2,61
Dramatic Play	31	1	6	2,42	1,728	1,79 3,05
Nature/Science	31	1	7	2,16	1,485	1,62 2,71
Math/number	31	1	6	1,71	1,395	1,20 2,22
Appropriate use of technology[2]	13	1	7	4,23	2,976	2,43 6,03
Promoting acceptance of diversity	31	1	2	1,29	,461	1,12 1,46
Gross motor	31	1	7	5,16	2,162	4,37 5,95

Source: own elaboration

If each item is analyzed, it can be observed that the minimum level is only reached in two items, "Appropriate use of technology" ($\overline{X}$ =4.23) and "Gross Motor", the latter being the one in which a qualifying level is reached as good and the maximum score in this subscale ($\overline{X}$=5.16). In most of the centres observed there is no use of technology in the classroom, finding in almost all of the classrooms an exclusive use of a music player to play some children's songs. Likewise, most centers have an outdoor space in which children spend at least 30 minutes, and both outside and inside there is material that stimulates a variety of skills - crawling, walking, running, climbing, jumping, etc. typical of gross motor

(1) In this case N is less than 31 since, as indicated in the scale, "if all of the group are under 18 months of age and no artistic activities are observed" will be qualified as NA, without taking into account this item in the general computation

(2) In this case N is les than 31 since, as indicated in the scale, "if technology is not observed, rate NA to this item". In this case, it is not also taken into account for the general count.

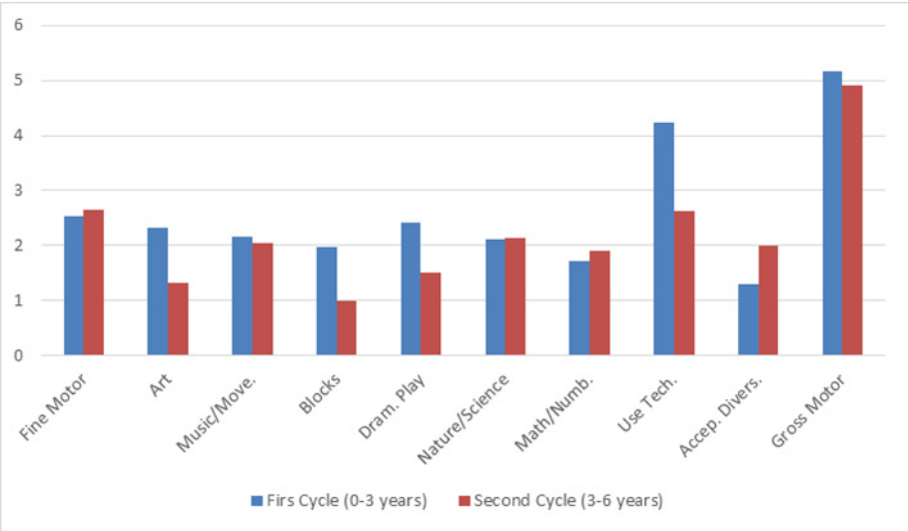
skills-, such as rockers, mini motorbikes, slides and tricycles, being the most frequent materials.

On the contrary, the worst results with a score of less than 2 have been obtained in "Promoting acceptance of diversity" ($\overline{X}$= 1.29),"Math/ numbers" ($\overline{X}$= 1.71) and "Blocks" ($\overline{X}$= 1,97). If we focus on the first item, it is remarkable that the maximum score obtained is 2 points. Mainly, no material representing diversity, race, culture, age, skill and/or non-traditional gender roles has been observed in the classrooms analysed. The only thing observed in any classroom is one or two black dolls. Regarding Mathematics, we have not found in most of the classrooms observed appropriate accessible materials for mathematics and numbers, nor have teachers used age-appropriate mathematical language ones (describe the sequences of an event, show the fingers when counted, compar3 figures, sizes and shapes...).

Analysing the item "Blocks", there are not specific centres of interest, nor this material to be at children's disposal in practically all the classrooms of the sample.

Finally, a comparison is presented (Figure II) with the results obtained in the subscale Activities in the first and second cycles of ECE, comparing the results of this work and the results of Morales Murillo et al. (2020). This comparative analysis has allowed us to observe how the data regarding the first cycle observed in our study are coincident with those obtained by Morales Murillo et al. (2020). This aspect will be discussed in more detail in the results discussion.

FIGURE II. Score in the subscale Activities First and Second Cycle



Source: own elaboration from the results of this research for the first cycle and Morales-Murillo, Grau-Sevilla, William and García-Grau (2020) for the second cycle

Discussion

After the application of ITERS-3, it is verified that the lowest score is obtained in the subscale "Activities" (X=2,59). These data are consistent with those provided in the previous study of Larrea et al. (2010) in classrooms with children between 0 and 3 years old, in which this tool was applied. In this case, Activities was also the lowest ranked subscale, with the average (X=2,56), which is distant from the desirable level.

The results obtained in the item "Promoting acceptance of diversity" are in line with the data provided by Barreto, Madrona and López (2017), in a study conducted with teachers and students of the Degree in Early Childhood Education in Spain, showing that training in intercultural competence is deficient, with little knowledge of interculturality. This contrasts with the reality in which we live, given that, if we take into account the data published by the INE (2020), the Spanish population increases thanks to the foreign population, which accounts for more than

10% of the total population. Outside the family environment, the classroom is the first place where the person begins to build his representation of the world, so it would be necessary to work to normalize diversity from this cycle.

Such low scores obtained in Math/Numbers contrast with evidence showing the importance of starting to learn mathematical concepts at an early age. The relationship between the learning of mathematics in ECE and the performance in mathematics at the end of Primary Education has been widely studied (Clements, 2001; Espinoza, Reyes y Rivas, 2019; Watts, Duncan, Clements y Sarama, 2018).

The score in the Blocks item also clashes with the evidence that the game through building blocks has benefits in different aspects, fundamentally mathematical, especially in the learning of spatial geometry, such as the composition and decomposition of geometric forms (Castro, Barrero and González, 2011) and that stimulate creativity by being unstructured materials, without a predefined purpose (Román and Cardemil, 2014).

Finally, it should be noted that these data, which show a score in which the minimum level is not reached in the subscale "Activities" observed in the first cycle of Early Childhood Education, coincide with those provided by Morales-Murillo et al. (2020) in a study of students of second cycle-students, also carried out in Spain in a sample of 22 centers (Figure II). In this case, the mean of the scores obtained in the area of Activities is also below the minimum or, although slightly lower than the average score achieved in this research ($\overline{X}$=1,97).

If we take the available data from the "Activities" subscale of other countries, we can see that, for example, in Scotland (Bradshaw, Hinchliffe & Scholes, 2020), as in Spain, it stands out as an area where many classrooms have achieved a minimum performance, with only 6% of classrooms with a score of 5 or more. On the contrary, in countries such as Norway (Kaarby & Tandberg, 2018) the results in "Activities" are higher ($\overline{X}$= 3,51), obtaining only a score below the minimum in three items: Blocks ($\overline{X}$= 2,00), Music and movement ($\overline{X}$= 2,37) and Arts ($\overline{X}$= 2,91).

While we do not stop at the Language and Books subscale after observing that the average score in that subscale is very close to those of the remaining four subscales, we would like to highlight the score obtained in the item concerning "Encouraging children´s use books" ($\overline{X}$= 2,77) because it is the only reagent in this subscale that does not reach

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the minimum score. In most of the classrooms observed, there was no classroom library or accessible space for children, in which they had a variety of stories at their fingertips. This low result does not match the importance of promoting reading from an early age, as set out in the LOMLOE, article 8.5 of which speaks of "(...) encourage a first approach to reading (...)".

The health crisis experienced during the information collection process could undermine the internal validity of the investigation, however, the data in this study is in line with data from previous research, as those carried out before the pandemic in Spain in the second cycle (Morales-Murillo, 2020) or in Scotland (Bradshaw, Hinchliffe & Scholes, 2020) both in the score of the subscale "Activities" and in the total score.

Conclusions

Improving the quality of Early Childhood Education brings countless benefits for the development and well-being of every child, as well as for society. And one of the pillars that sustain it is the professional competence of its teachers, developed not only through experience and modeling, but also through initial and permanent theoretical-practical training. In the performance of teaching, one of the essential aspects to work with children from 0 to 6 years old, is to apply the principles of well-being, activity and integral development and, accordingly, the appropriate selection of teaching and learning activities.

The score obtained in the "Activities" subscale of the ITERS-3 tool is the lowest of all the evaluated, not reaching even the minimum level in 8 of the 10 proposed items; in the same way, it highlights that the in the subscale "Language and Books" the minimum level is not reached in 1 of the 6 items. If we take as a starting point the modules of didactic-disciplinary training of the Degree in Early Childhood Education (Table I) and relate it to the items presented here: Arts, Music, Nature and Mathematics and Motivation towards the use of books, we find that in the scores obtained do not reach the minimum.

The results obtained in this study on the activities and disposition of educational resources and elements in classrooms of the first cycle of Early Childhood Education, which confirm the results obtained in the study applied in the second cycle by Morales-Murillo et al. (2020), contribute to

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highlight the need for the competent educational administrations and the Faculties of Education to begin to rethink and update the professional development of teachers at this stage. In the case of initial training, it should be done with university training proposals leading to the degree of Graduate in Early Childhood Education. Not only the disciplinary programs, but the model of training practices and their relationship with the referents for the professional insertion of the early childhood teachers. It is necessary to offer sufficient tools to the next promotions of teachers and to equip them with the necessary competences to achieve a quality Child Education, without forgetting that in-service teachers need an adequate lifelong training. No generation of children should be educationally left behind, and this requires training and caring more and better for teachers who do so much and can make it happen.

Based on the interest of the results shown by this study, and despite the difficulty of obtaining representative samples from centres and classrooms in studies of this nature, it would be of great interest to continue working in order to be able to expand the sample and carry out a detailed analysis of the differences in the subscale "Activities" according to the contextualized variables associated: teaching qualification, age of children and type of centre, among others.

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Medical models applied to teaching: the proposal of the "educational MIR" in the light of international experiences of initiation to the teaching profession

Los modelos médicos aplicados al profesorado: la propuesta del "MIR educativo" a la luz de las experiencias internacionales de iniciación a la profesión docente

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Abstract

In recent years, the idea of implementing a model of access and initiation to teaching inspired by the system used in the health professions, known as the educational MIR (medical intern or resident doctor), has gained strength in Spain. This paper examines this proposal in depth, analysing it from an international perspective. To this end, after a brief overview of the literature on the application of the preparation models used in medicine to the teaching profession, a literature review was carried out to identify the features that characterise the induction programmes based on the clinical approach that have obtained the best results in other countries, as well as the main recommendations of two international organisations, the OECD and the EU, on effective policies to support professional induction to teaching. These features and recommendations are contrasted with the proposal of the educational MIR, in order to infer the possibility of its application and the requirements that should be met to successfully implement the model in the Spanish educational system. Although this proposal is considered viable and could contribute to overcoming some of the problems that teacher preparation in Spain has been facing for some time, prior to its implementation it would be necessary to address some issues that the

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international literature highlights as necessary conditions for the MIR to make a real contribution to the improvement of the teaching profession in our country.

Key words: Teacher profession, teacher recruitment, professional induction, professional learning, comparative and international education, educational policy, Spain.

Resumen

En los años pasados cobró fuerza en España la idea de implantar un modelo de acceso e iniciación a la docencia inspirado en el sistema empleado en las profesiones sanitarias, conocido como el MIR educativo. Este trabajo profundiza en dicha propuesta, analizándola en perspectiva internacional. Para ello, tras un breve repaso a la literatura sobre la aplicación de los modelos de preparación utilizados en medicina a la profesión docente, se ha realizado una revisión bibliográfica destinada a identificar los rasgos que caracterizan los programas de inducción a la docencia basados en el enfoque clínico que han obtenido mejores resultados en otros países, así como las principales recomendaciones de dos Organismos Internacionales, la OCDE y la UE, sobre políticas efectivas de apoyo a la iniciación profesional a la docencia. Dichos rasgos y recomendaciones se contrastan con la propuesta del MIR educativo, con el fin de inferir la posibilidad de su aplicación y los requisitos que deberían cumplirse para implementar con éxito este modelo en el sistema educativo español. Si bien dicha propuesta se considera viable y podría contribuir a superar algunos de los problemas a los que se enfrenta desde hace tiempo la preparación del profesorado en España, previamente a su implantación sería necesario atender a algunas cuestiones que la literatura internacional pone de manifiesto como condiciones necesarias para que el MIR pueda suponer una contribución real a la mejora de la profesión docente en nuestro país.

Palabras clave: Profesión docente, acceso a la profesión, iniciación profesional, aprendizaje profesional, educación comparada e internacional, política de la educación, España.

Introduction: the educational MIR proposal

Teacher preparation is one of the subjects most extensively studied in educational research. For decades, focus was particularly centred on the initial training, as it was considered the most relevant stage for acquiring the professional skills. However, the importance of the first few years of

experience as an essential period for quality teaching, even more than the training itself, has been highlighted for some time (Hanushek and Rivkin, 2006). It is at this stage of teaching integration, which lies between the finalisation of the initial studies and the independent professional practice, when novice teachers access the profession and form their stance on what 'being a teacher' means, given that this is where their socialisation and incorporation into the school culture takes place.

Accordingly, on the back of growing interest paid to integration into teaching, an increasingly greater number of countries have introduced support systems for the professional incorporation of new teachers (Eurydice, 2018). Said systems are often called 'induction', a reflection of the dominance of the English language on this subject (Kutsyuruba, Walker and Godden, 2019). In the case of Spain, the 2006 Organic Law on Education (LOE) commenced a timid attempt at reform by establishing the monitoring of newly incorporated teachers by a tutor during the first year of professional practice. However, in practice, there is no system that can be appropriately classified as induction for novice teachers (Álvarez-López *et al.,* 2019).

The possibility of introducing for teachers a procedure similar to the MIR (resident internal doctor) used in medicine, which would entail a substantial reform of the access model to teaching work and creation of an induction system for new teachers, has been considered over recent years in our country. In fact, this idea, initially formulated by education experts, managed to achieve certain consensus in the political field (Bolívar, 2012), which is unusual when discussing educational issues in Spain. In reality, it isn't a unique project, as, in addition to the aforementioned MIR, other models have been proposed with different levels of detail, such as the DIR (teacher intern or resident teacher), DEP (teacher in practice placement) PrIR (professor intern or resident professor) and Resident Professor (Bolívar, 2012; López-Rupérez, 2015; Marina, Pellicer and Manso, 2015; Moya *et al*., 2019; Nasarre and López-Rupérez, 2011; Valle and Manso, 2018). Despite variations that exist among these options, they all seek to transpose to the teaching field, with the adaptations required, the method used for selecting and training healthcare personnel prior to entering unsupervised professional practice. In general terms, the most important characteristics shared by the proposals on the educational MIR are as follows (López-Rupérez, 2015; Moya *et al*., 2019; Valle and Manso, 2018):

- It is a mandatory system for entry into the profession and theoretical-practical training for all teachers that are going to teach at pre-university levels, both in public, private subsidised and private schools.
- The selection of participating teachers is carried out on finishing their university studies. The admissions process is homogeneous throughout the country, although, depending on the specific proposal analysed, it may combine standard state-wide tests and specific tests developed by the autonomous regions. In any case, admission is restricted and the vacancies correspond to the need envisaged for teaching professionals in the education system.
- It is undertaken in real work environments, teaching centres that are selected according to a series of established requisites and that have the recognition to function as such.
- The residency period in centres is two academic years[1], which combine training with supervised professional practice.
- The teacher in training is accompanied by an experienced teacher who acts as an accredited tutor or mentor, guiding and supervising the novice teacher throughout the period.
- The teachers who take part in the programme have an employment contract as practice placement teachers and are appropriately remunerated for their work.
- The new teachers are assessed to ensure they have acquired the professional competencies. If they pass the final assessment, they are given a certificate that allows them to work as a teacher.

The MIR system seeks to improve the process of incorporating individuals into teaching and professional activity. However, beyond that, it seeks to be an instrument for strengthening the teaching profession and, accordingly, contributing to improving the education system (López-Rupérez, 2018).

In light of this initiative, it is worth considering certain questions, the answers of which aim to contribute to this study: Why use a model created for the medical profession in the teaching field? Are there initiatives similar to the educational MIR in other countries that have obtained the results expected? Would this system fit in with the current lines of

(1) The educational MIR outlined by Nasarre and López-Rupérez (2011) includes, as a prior phase to the residency, a one year's Master's course taught in higher teacher training centres.

reform in the policies on entering the teaching profession? What can the international experience tell us about effectively applying a model like the educational MIR in Spain?

The purpose of the article is, therefore, to explore the proposal of the educational MIR in more depth, analysing it in the light of international experience. This analysis allows us to explore the use of medical models in the professional preparation of teachers and to find out if the project is aligned with current trends in relation to entering teaching and the corresponding induction. Furthermore, the comparative perspective may help to deduce both the viability of the educational MIR and the conditions required for its successful application in the case of Spain.

Method

To respond to the questions posed, an exploratory search was initially conducted on the international literature on the application to the professional field of teaching of the preparation models used in medicine. The aim of said search was to investigate the main arguments that back or, conversely, question their use, as well as to identify the most important experiences gained in this regard in other countries.

Once a general overview of the subject was obtained, a literature review was undertaken, the details of which are set out in the corresponding section of the text, specifically focussed on two types of sources: (1) work that identifies the characteristics shared by the teaching induction programmes based on medical models that have obtained the best results in other countries, and, (2) OECD and EU publications in which recommendations are formulated on effective support policies for the professional initiation into teaching. Both sources are contrasted with the central elements of the educational MIR in order to delve into the possibilities and requisites required to properly implement this model in the Spanish education system.

The preparation models of medical professionals applied to teachers

The idea of applying models used in the medical profession to preparing teachers cannot be considered as new, given that it goes back at least to

the start of last century, when Dewey pointed to the need to use in the field of education the training systems used in more mature professions, especially medicine (Dewey, 1904). However, it wasn't until the final few decades of the 20th century when this approach started to gain traction in some contexts, which continues today (Booth, 1995; Darling-Hammond, 2006; Hargreaves, 2007; Rickards, Hattie and Reid, 2020; Shulman, 1998).

The analogy between teaching and medicine is based on the fact, despite the differences that may be found, that there are many similarities between both professions. Both have as a central element people towards whom their activity is geared (patients or students), both require specialist knowledge and skills, and both require the use of critical thinking above the use of technical abilities (Alter and Coggshall 2009; Becher and Lefstein, 2020; Foster-Collins, 2020; Philpott, 2017). Specifically, a number of features that both fields share is the difficult transition that their respective new professionals experience, as they have to translate the knowledge acquired during their training into real-life practise in dynamic and ever-changing work environments. Given the complexity of the professional practice in both cases, integrated training models are needed that eliminate the separation between theory and practice, and that accentuate the connection between cognition and experience through in-situ learning, with guidance by experienced professionals (Kriewald and Turnige, 2013).

This parallelism with healthcare professionals has been used in education to re-conceptualise the teaching profession as a "clinical profession" or a "clinical practice profession" (Alter and Coggshall 2009; Becher and Lefstein, 2020). The notion of clinical practice in education lies in the fact that teacher activity must clearly focus on student development and learning, be based on evidence and use reasoning processes that lead to decision-making. Although this model in itself does not require a radical reform in the teacher preparation systems, it does imply a significant change in the traditional way of understanding practical teacher training (Kriewaldt and Turnige, 2013). Also, said change must not be limited to the initial preparation, but rather must extend to the first years of professional practice and, in general, to the entire teaching career (Peters, Cowie and Menter, 2017).

At the core of the proposals, aimed at modelling the initial and continuous preparation of teachers based on the example of healthcare professionals, is the idea that professional learning in medicine is more

effective than professional learning in education. In fact, it is considered that the training model of doctors has largely contributed to the progress of medical sciences, while said progress has not materialised in the case of teaching. As such, the reform of teacher training based on the principals of clinical practice is proposed as a route to continue renovating education and the teaching profession, as occurred in medicine at the beginning of the 20th century (AFT, 2013). The use of the medical model not only contributes to better teacher preparation, but it can also serve to elevate the professional status of teaching and to enrich educational research, linking it to action undertaken in schools (Hargreaves, 2000; Thorpe, 2014).

However, not all positions relating to the use of medical models in education are favourable, and this approach has been criticised. Although it is not possible to address in detail the arguments of opposing positions, it is evident that between both professions there are obvious differences and certain tension is noted on applying medical practices and language to the educational field. Occasionally, the transposition is based on an idealised concept of medical preparation, underpinned by a traditional and positivist vision of the profession, which looks more at biomedicine than areas closer related to education, such as public or mental health (Philpot, 2017). Furthermore, it is considered that this approach could be an instrument that leads to the standardisation of teaching, focussing on objectives and results above educational purposes, which would deteriorate the teaching profession (McKnight and Morgan, 2020). However, despite these objections, the clinical approaches for the professional learning of teachers have gained international recognition and have received both academic and political support in recent years (Philpot, 2017). To cite just one example, the OECD has echoed the idea, committing to "clinical experience" as a suitable mechanism for articulating the theory and practice in teacher preparation (OECD, 2010). Recently, in a review on effective teaching policies, this organisation concluded that one of the elements shared by the countries with the best results is the existence of a period of mandatory and extensive clinical practice for teachers, whether during the initial training or the induction (OECD, 2018). Specifically, the OECD has stated that the creation of a residency system similar to that in medical training should be priority in all countries and "could represent a political milestone in building

continuous growth and the professional development of teachers (Paniagua and Sánchez-Martí, 2018: 4).

In the middle are some experts who deem that the appropriateness of the medical model in preparing teachers must not be considered in dichotomous terms, but rather they propose productively adapting the mentioned model to the inherent characteristics of teaching work. They believe this approach complements rather than substitutes the most humanistic concepts of teaching (Becher and Lefstein, 2020) and would therefore entail using the medical metaphor as a new paradigm to reconceptualise the practical preparation of teachers (McLean *et al.*, 2015).

In the international field, examples can be found of experiences in which the clinic models were applied to teacher preparation in different countries, such as Australia and Scotland (Peters *et al.*, 2017), although greater presence has been achieved in the US and England. In the US, said experiences go back over four decades, since the mid-1980s when so-called Professional Development Schools (PDS) for teachers began to be created. The idea was fostered by The Holmes Group, an alliance of a hundred deans of the most prestigious faculties of education in the country, which proposed increasing the quality of teacher training, closely connecting it with research on teaching and learning, and with practice placements in education centres (Holmes Group, 1986). Borrowing the medical model of university hospitals, a Professional Development School is an exemplary public centre that includes, among its main functions, providing new teachers an introductory period of supervised teaching (Holmes Group, 1986). Although the PDSs were not a totally new idea in the education system, as there were some precedents, from that moment onwards all the universities in the group created this kind of centre, which subsequently spread throughout the country (Fullan *et al.*, 1998).

Teacher residencies are also used in the United States, which have been implemented in different states since the beginning of the 2000s. They were created to meet the needs of hiring teachers in some districts in which it was difficult to cover vacancies and find candidates with the appropriate qualifications. Residencies were considered as a channel for certifying teachers based on clinical training adapted to the needs of the schools in which they were going to work (Guha, Hyler and Darling-Hammond, 2016). In practice, there is extensive variability among residencies as regards organisation, financial backing and duration.

While some are limited to a school year, others establish a subsequent follow-up after entering professional teaching through specific induction programmes (Coffman and Patterson, 2014).

In the case of England, the idea of emulating the medical model was adopted in the improvement policies of the teaching profession from 2010 onwards, a year in which the national network of Teaching Schools started to be created to lead the training and professional development of teachers and head teachers. According to the white paper that established said initiative, the increase in educational quality requires "giving outstanding schools a much greater role in teacher training in the same way that our best hospitals train new doctors and nurses" (DfE, 2010: 3). From then on, a network of Teaching Schools was created that comprises over 750 recognised centres and that is currently envisaged to be replaced by hubs of Teaching Schools of excellence for initial and continuous teacher training. These hubs will play an important role in the new reform programme of the first few years of the professional teaching career that will be implemented in the country from September 2021 and that will replace the current compulsory induction system lasting one school year for one lasting two years (DfE, 2019).

As regards the results obtained by these initiatives, the studies that have analysed the US experiences find, in general terms, improvements in the perception of self-efficacy of teachers and in the results of students. However, they also note limitations regarding this body of research (Clift and Brady, 2005). It has also been stressed that PDSs entail a heterogeneous set of programmes, with different levels of quality (AFT, 2013). Although some on them have contributed to improving the link between theory and practice in teacher training, they have been considered, at best, as "islands of improvement" (Fullan *et al.*, 1998: 25), that have not led to a substantial change in the system as a whole. One of the problems in terms of expanding the success of these experiences has been their high cost, as well as the difficulty in integrating the two cultures involved: university and school.

In the case of England, few studies on the impact of Teaching Schools have been conducted. The assessments carried out to date have been mainly funded by official bodies that promote the initiative and they are based more on the perception of participants than on the empirical results of their effects (Dowling, 2017). However, some exploratory studies have found benefits for new teachers in terms of confidence

levels in their work and in the perception of their practical improvement (Walker, Straw, Worth and Graysonen, 2018).

In the European context, with the exception of English-speaking systems, reference to the medical model is less common when talking about teachers. However, in the opinion of some authors, the approach of some training and induction programmes used in countries, such as Finland and The Netherlands, would allow them to be considered, within the teaching context, as clinical practice (Burn and Mutton, 2015). The results of these experiences point to the positive effects produced in the preparation of teaching work, given that they boost the confidence, efficiency and professional commitment of new teachers. However, the difficulty in establishing generalisations on programmes of such a diverse nature is also highlighted (Burn and Mutton, 2015).

Conditions for the success of the educational MIR in light of the international experience

The educational MIR explicitly commits to a teaching access and entry model inspired by the system used in the medical profession. To contrast this proposal with the experiences designed with the same focus in other educational systems, a literature search was conducted. After disregarding studies of a descriptive nature, only two studies were found of an appropriately comparative and international nature that clearly identify the programmes in different countries and that contrast the corresponding common elements (Asia Society, 2014; Burn and Mutton, 2015). However, in addition to them, six publications were also identified that undertake a review of programmes on a national scale. One of them regards the English case and analyses the effective induction practices developed in different institutional contexts, among which Teaching Schools are included (Walker, Straw, Worth and Graysonen, 2018). The five remaining studies analyse the US Teacher Residency Programmes that have obtained the best results (Coffman and Patterson, 2014; Guha *et al.*, 2016; NCTR, 2018; Silva, McKie, Knechtel, Gleason and Makowsky, 2014; UTRU, 2015). Regarding the latter studies, it is important to state that it isn't always possible to precisely define the lines between initial training and professional incorporation, as some of the programmes

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analysed have been designed to bridge the gap that exists between both phases and cover both simultaneously.

Given that the literature found fundamentally lies in the Anglo-Saxon context, in order to expand the perspective on the study topic, a review was conducted on the reports and publications of international bodies on the effective policies and practices of teaching profession access and entry. As such, identifying the extent to which the educational MIR proposal responds to the current reform trends in the teaching profession within the international panorama is sought. Specifically, the documentation produced by the OECD and the EU, due to being the two most influential organisations in the case of Spain, has been examined. From the vast number of publications that both organisations have dedicated to this topic over the last two decades, six documents have been selected in which specific recommendations and proposals are made for the development of effective policies on entry into the teaching profession (European Commission, 2010; 2019; European Commission-IFB, 2013; OECD, 2005; 2019a, 2019b).

Together, with these two complementary approaches, a total of 14 documents published since 2000 have been reviewed. The results obtained are summarised in Table I, in which the central components of the programmes based on medical models mentioned in the literature, as well as the characteristics of the systems that more effectively support the transition from the initial teacher training up to professional practice according to the international organisations, are set out.

TABLE I. Key characteristics of effective induction into the teaching profession

	Induction programmes based on medical models[a]	Recommendations of international bodies[b]
Perspective/approach:		
Integrated in the continuum of teacher development	6, 8	9, 11, 12, 13, 14
Precise definition of the objectives, structure and responsibilities of all involved	2, 5, 6	9, 11
Centred on student learning	2, 3, 4, 5, 6, 7	9
Purposes and objectives:		
Bolstering educational knowledge by reflecting on practice	2, 3, 4, 5, 7, 8	9, 12, 13
Introduction into the professional culture and development of the teacher identity		9, 10, 11, 12
Components of the programme:		
Personalised support by a mentor	1, 2, 3, 4, 5, 6, 7, 8	9, 10, 11, 12, 14
Interaction with teaching experts and novices	1, 3, 8	9, 10, 11, 12, 14
Structured observations	1, 3, 8	
Training sessions by experts	3, 5, 6, 8	9, 10, 14
Novice teachers:		
Selection with clearly established criteria and according to system needs	3, 4, 5, 6, 7	7, 14
Reduced teaching workload	8	11, 14
Remunerated	4, 5, 7	11
Tutor/mentor:		
Selection based on criteria such as commitment and teaching skills	1, 3, 5, 6, 7, 8	9, 11, 13, 14
Training for the task of mentor	1, 3, 5, 6, 7	10, 13, 14
Reduced teaching workload/mentoring time	8	11, 14
Centres:		
Practice communities characterised by a culture of support and collaboration	1, 2, 4, 5, 7, 8	9, 12, 13, 14
Assessment:		
Continuous and formative assessment focussed on developing teaching skills	1, 5, 6, 8	10, 12, 14
Final summative assessment linked to the accreditation required to practice professionally	4, 5, 6, 7	11, 12
Monitoring, assessment and accountability of own programme	4, 5, 6	9
Conditions for success:		
Sufficient resources and appropriate budgetary planning	1, 3, 5, 7	9, 14
Coordination between all interested parties and cooperation with the education administration	3, 4, 5, 6, 7	9, 14

1. Asia Society, 2014; 2. Burn and Mutton, 2015; 3. Coffman and Patterson, 2014; 4. Guha *et al.,* 2016; 5. NCTR, 2018; 6. Silva *et al.,* 2014; 7. UTRU, 2015; 8. Walker *et al.,* 2018.

9. European Commission, 2010; 10. European Commission, 2019; 11. European Commission-IFB, 2013; 12. OECD, 2005; 13. OECD, 2019a; 14. OECD, 2019b.

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The table reflects the features of the programmes in which there is a similarity in three or more of the documents reviewed. Other aspects, such as the remuneration of tutors or the commitment of head teachers, appear occasionally in some studies. The duration of programmes doesn't feature in the table, given that there is no agreement as to such regard in the literature reviewed. The time mentioned ranges from one to three years. As can be seen, there is much common ground between the features of the effective programmes based on the medical model and those mentioned by the international organisations, although some nuances are emphasized in some jobs to a greater degree than in others.

The contrast between the elements set out in the table and the essential aspects of the educational MIR allows us to establish that, at least from a theoretical approach, the proposal for Spain shares a good proportion of the characteristics of the successful programmes based on medical models and of the recommendations of the international organisations. In general, the MIR would be in keeping with the experiences obtained in other contexts and, therefore, could be considered a viable option for access and initiation into the teaching profession in Spain. However, a detailed examination of the elements contained in the international literature may also serve to make us aware of some issues to which special attention must be paid in order to effectively implement a system like that of the educational MIR.

One of the issues that is worth considering relates to MIR selection and access. Tailoring the number of places available for the MIR to the education system's need for teachers requires medium to long-term forward planning of the vacancies and teacher demand per stage and speciality, something which Spain does not currently have (Eurydice, 2018). As such, this planning will need to be created before implementing the model. Moreover, proposing restrictions on MIR places, beyond the access procedures to initial training institutions, is not realistic. If no selection process is undertaken prior to being accepted onto university teaching degree courses, but a limit is placed on MIR entrance, a large number of candidates would receive training without subsequently having access to a residency. This would not only be inconsistent with the rational use of resources, but would also be detrimental to quality and generate false expectations in people unable to work in the profession after graduating. The similarity with the healthcare MIR requires this issue to be considered, as, in medicine, a dual selection process is undertaken.

In relation to mentors, a large part of the documents reviewed point to, as a critical element for the success of programmes, their selection and accreditation according to merit linked to purposes, like their teaching abilities and commitment to the profession, and not based on criteria such as seniority. This once again entails a challenge for the implementation of the educational MIR in Spain, given that teacher assessment systems that allow the most suitable teachers for tutor roles to be identified do not exist.

Linked to the foregoing, it is also worth mentioning the selection and accreditation of education institutions in which the residency of new teachers would take place. To achieve the results sought, the MIR must be undertaken in schools that have the capacity to offer quality training, where there is a culture of experimentation and collaboration, and that operate like practice communities in which teaching is seen as a team task with shared responsibility. This is a major challenge, as having a vast number of schools that meet those requirements and that can offer real professional learning opportunities to novice teachers would be needed.

An additional aspect is the final assessment, linked to a professional certificate. In the medical programmes, residents often require a positive assessment to be able to enter professional practice. As such, the assessment mechanisms used and the duties of those responsible for putting them into practice are precisely established. In the education field, however, the support role and assessment role of tutors tend to be perceived as two conflicting demands (OECD, 2019a). Therefore, deep reflection is needed on how to assess the acquisition of the corresponding professional competencies by new teachers and to overcome cultural barriers that may arise when putting the model into practice.

Together with the foregoing, the successful implementation of the MIR would also have to ensure two necessary conditions for the system to work correctly, an aspect on which there is extensive consensus in the literature: coordination and funding. Moreover, the programmes must be based on agreement and collaborative work among of those responsible for designing the training, the schools in which the training is to take place, the education administration and the professional organisations, as well as the other sectors involved. The medical MIR has said coordination, but the educational MIR would require these collaborative relationships to be created, something that cannot be improvised and that is particularly

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complex in a decentralised system such as that in Spain, where the autonomous regions have significant weight in education policy.

In terms of the cost of implementing the system, some estimations indicate that to cover the teacher demand in Spain over the next decade, the allocation of around 700 million euros, corresponding to the payment of the salaries of teachers on practice placements, would be needed. Furthermore, an additional 170 million euros would be required to compensate the reduction in workload of mentors and for other costs of the programme. Although it does entail a significant budgetary allocation, it is considered doable within an investment scenario of 5% of the GDP in education (Moya *et al.*, 2019). Even so, guaranteeing the allocation of these resources and their availability over time is an essential requisite for the sustainability of an initiative like the MIR.

In any case, without downplaying the issues mentioned, it is likely that the essential element for the success of the educational MIR is in one the characteristics particularly mentioned in the literature on medical models: the centrality of student learning as the key element of the design and development of the programme. For participating teachers, the MIR must entail the opportunity to follow a training plan aligned with classroom experience and geared towards facilitating student learning. If the parallels with medicine seek to go beyond rhetoric, novice teachers must participate in a search and experimentation process that serve to understand the specific needs of students, formulating and implementing pedagogical actions and assessing the results. That involves moving away from the practical training understood as a routine way of working or as imitating teaching experts (Burn and Mutton, 2015), which leads to the socialisation of students in maintaining the status quo and halting innovation, as often occurs in practicums undertaken by students during their initial training (Egido and López-Marín, 2016).

Conclusions

The implementation of the educational MIR would be novel in the case of Spain, albeit the idea of applying preparation models used in medicine to the teaching profession has precedents on a theoretical level and in some experiences implemented in other countries, especially in the Anglo-Saxon context. However, the educational MIR is a more ambitious

proposal than the initiatives undertaken in the United States, given that only a small number of teachers participate in them (UTRU, 2015), while the Spanish plan would involve a universal model aimed at all teachers that join the profession, in line with the reform currently underway in the English education system.

The literature review shows that the educational MIR would be in line with best international practices on entry into the teaching profession and with the recommendations of the international organisations. However, it is not possible to ignore that the results of these international experiences are closely connected to the social, political and educational context in which they took place. Therefore, this study, aiming to go beyond the approach of policy borrowing, in which the uncritical transfer of practices from other places is considered feasible, has used the comparison to delve deeper into the proposal of the MIR and to identify problems that could foreseeably arise on implementing it in our school system. In this regard, issues like the access restriction of new teachers, the selection of tutors and schools, the coordination between the sectors involved and funding, among others, show that it is not possible to undertake a substantial reform of the teaching profession with an isolated intervention. It would, therefore, entail major changes to be undertaken in current teaching policies and would require time and strong determination to formalise agreements to apply the model with a number of minimum guarantees of success.

In addition to the foregoing, transferring the MIR model to teacher preparation would require a lot more than just consideration of the organisational elements or "architecture" of the programme, although that would be important (McLean *et al.*, 2015). If the aim really is to use the medical model to undertake a comprehensive transformation of teacher preparation, the most important element is covering the substantial aspects of the training, undertaking a programme that is clearly oriented towards cultivating in new teachers the professional learning that contribute to improving student education (Escudero, 2019).

Meeting the conditions stated, a system like the MIR, whether under this name or another, could help in overcoming some of the long-present challenges in teaching that the successive reforms undertaken in our country have not been able to resolve, such as the integration of theoretical knowledge and training experience, the imbalance between professional availability and demand, and the coexistence of parallel

channels through which to access the profession. It would also serve to contribute to redefining teacher professionality based on collaboration, creating from the beginning of the professional activity the habit of teamworking (Bolívar and Luengo, 2019). Furthermore, it would favour greater social recognition of teaching and increase the standing of the prestigious profession (López-Rupérez, 2018).

Among the factors that could facilitate the implementation of a system like this is the fact that there is extensive agreement on the need to introduce an access and initiation system into the profession between the initial training and full professional practice. Furthermore, given that it is a new period in the professional trajectory of teachers in our country, it does not come up against the weight of established traditions or created interests. As such, from an education policy perspective, it could be the first step in reforming the teaching profession (Fernández-Enguita, 2019).

However, conversely, nobody is blind to the fact that important barriers would have to be overcome to implement the MIR. Beyond those already mentioned, the greatest obstacle would no doubt be the same old resistances that have stopped all other attempts to comprehensively change the teaching profession (Viñao, 2013). Strong opposition is expected by an opinion-based sector, which also includes politicians, who still think that teaching is not a profession in the strictest sense of the word, nor does it need to be, as extensive specialised pedagogical knowledge is not required, with disciplinary knowledge being sufficient (Thorpe, 2014).

Taking the foregoing into account, on putting a proposal like the educational MIR into practice, consideration should be given to the warning provided by Fullan and co., that «reform in teacher education is going to require years of intensive, smart, and hard work at all levels of the system. One could not underestimate the complexity of the challenge» (Fullan *et al.*, 1998: 15-16). In any case, it would be worth taking it into consideration as a possible path for a thorough reform of teacher preparation practices.

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Meta-analysis of reliability generalisation of the FIT-Choice questionnaire (Factors Influencing Teaching Choice)[1]

Meta-análisis de generalización de la fiabilidad del cuestionario FIT-Choice (Factores que influyen en la elección de la enseñanza como carrera)

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Abstract

Teacher effectiveness depends on academic and non-academic factors. Teaching motivation is an element of the latter group of factors that has been widely studied to determine who will enter the teaching profession. In this context, FIT-Choice (Factors Influencing Teaching Choice) is one of the most widely used

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instruments internationally and has undergone both language and dimensional structure adaptations. The aim of this study is to analyse the reliability of the different scales and how they vary in works that use this instrument, through the reliability generalisation meta-analysis technique using a random effects model. Specifically, we use a random effects model to estimate mean reliability and we study the heterogeneity of coefficients using Cochran's Q and I^2 tests. Meta-regression is also used to study the effect of moderating variables that relate to the instrument (type of FIT-Choice, test language) and the sample (type of teacher, % of women and age). The results show good average reliability for most of the scales, apart from job transferability, fallback career and high demand, which have values below 0.7. High reliability variance between studies stands out, with the satisfaction scale displaying the greatest heterogeneity. The findings show that the reliability of subscales is affected by the type of FIT-Choice and the type of teacher.

Key words: teacher motivations, FIT-Choice instrument, meta-analysis, reliability

Resumen

La eficacia docente depende de factores académicos y no académicos. Entre los segundos, la motivación es una característica muy estudiada para determinar quién accede a los estudios de maestro. En este contexto, el instrumento FIT-Choice (*Factors Influencing Teaching Choice*) es de los más utilizados a nivel mundial y cuenta con diversas adaptaciones de idioma y de estructura dimensional. El objetivo de este trabajo es analizar la fiabilidad de las distintas escalas empleadas y su variabilidad entre los trabajos que la usan, mediante la técnica de meta-análisis de generalización de la fiabilidad. Concretamente se propone un modelo de efectos aleatorios para estimar la fiabilidad media y se estudia la heterogeneidad de los coeficientes con los estadísticos Q de Cochran y I^2. También se emplea la meta-regresión para conocer el efecto de variables moderadoras relacionadas con el instrumento (tipo de FIT-Choice, idioma de la prueba) y de la muestra (tipo de docente, % de mujeres y edad). Los resultados muestran una buena fiabilidad promedio en la mayor parte de las subescalas, excepto en tres, movilidad en el trabajo, elección de la carrera como opción alternativa y dificultad percibida, con valores por debajo de 0.7. Destaca la gran variabilidad de la fiabilidad entre estudios, siendo la escala de satisfacción la que presenta mayor heterogeneidad. Los hallazgos muestran cómo la variación de la fiabilidad de algunas escalas está vinculada a las características del FIT-Choice utilizado y al tipo de docente.

Palabras clave: motivaciones docentes, cuestionario FIT-Choice, meta-análisis, fiabilidad

Introduction

Research has shown that the best thing schools can do for students is to provide good teachers, since being taught by good teachers can put even the most disadvantaged students on the path to university while time spent with ineffective teachers can lead to school failure that students struggle to overcome (Jordan et al., 1997; Schleicher, 2018). The essential role of teachers in the quality of the education students receive has been demonstrated in a large number of empirical studies. Hattie (2008 and 2011), who performed meta-analyses of over 65,000 research works on the effects of hundreds of interventions on the learning of 250 million students, concludes that factors such as class size or level of investment, which are usually regarded as important, actually have little effect on students' learning. Instead, the quality of the teacher is the most decisive factor after controlling for other contextual effects such as the origin of the students, and increased teacher quality has a more effective impact than any other educational investment, even reducing class size (Goldhaber, 2010). The famous *McKinsey report* (Barber & Mourshed, 2007) also identifies teachers as a key factor in the educational systems that have the best results in international evaluations, to the extent that an educational system can never be better than the quality of its teachers.

This backdrop justifies the focus in research on establishing which characteristics of teachers or people who wish to become teachers relate most closely to their efficacy. One example of this interest can be found in the *Teaching and Learning International Survey* (TALIS) (INEE, 2020) and the *TALIS Initial Teacher Preparation study* (OECD, 2017), which focus on the importance of selecting the best candidates for initial teacher education (ITE) programmes. In this regard, the policies of countries such as England and Wales stand out, where Klassen and Dolan (2015), after reviewing 74 ITE programmes, confirmed that they all use procedures for selecting prospective teachers based on their cognitive and non-cognitive characteristics. Similarly, in Australia the standards set by the Australian Institute for Teaching and School Leadership (AITSL) for candidates include levels of command of language and maths equivalent to the top 30% of the population (AITSL, 2011).

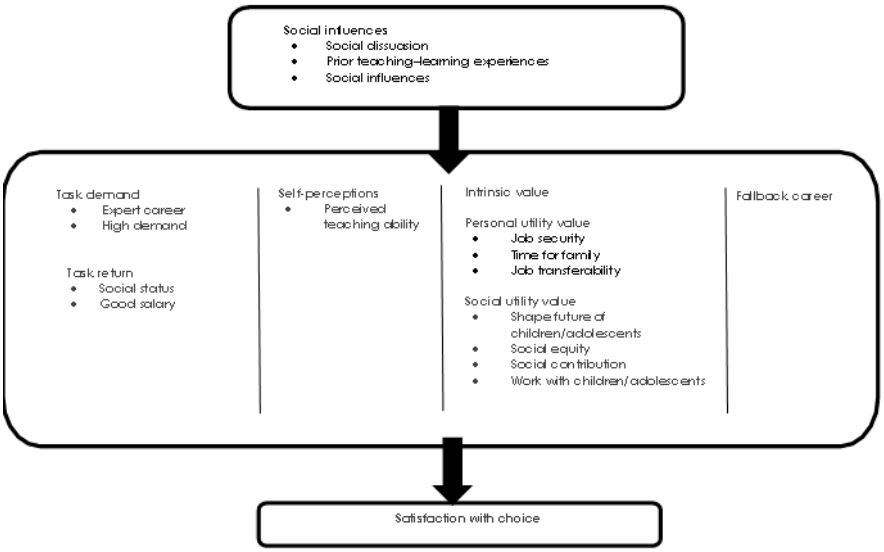
The volume of primary research on this topic has inspired relevant secondary research, such as the meta-analysis by Klassen and Kim (2017), which identifies a small but significant effect of teaching efficacy relating

to a set of individual academic attributes (disciplinary knowledge, cognitive skills and pedagogical knowledge) and non-academic attributes (personality, motivation, beliefs and dispositions), which in turn interact with contextual factors (cultural, social and prior teaching–learning experience). The systematic review by Coe et al. (2014) is also noteworthy. This analyses 200 works and identifies six components of what they call "great teaching". These are principally pedagogical content knowledge and quality of instruction, as well as classroom management, classroom climate, beliefs about teaching and learning and other wider professional elements such as relationships or career development. With regards to the importance of non-cognitive factors, the meta-analysis by Brookhart and Freeman (1992) should be noted. This included works from the USA from between 1960 and 1990. The synthesis of these works suggests that altruism and intrinsic motivations along with service orientation were the main reasons for choosing a career in teaching. Heinz's work (2015) continues with analysis of research into non-cognitive factors, reviewing works from 1990 until 2014 in depth. She performed a systematic review of 41 studies, concluding that in 23 of them the reasons that led people to choose teaching as a profession are grouped around the same factors: intrinsic, extrinsic and altruistic motivations. Finally, the review by Fray and Gore (2018) of empirical studies published between 2007 and 2016 concludes that in most of them (63 of 70), intrinsic and altruistic teaching motivations have more weight than extrinsic ones.

The model Helen Watt and Paul Richardson propose for measuring the factors at play in choosing teaching as a profession includes all of these components and links the decision to choose a career in teaching with expectancy-value theory (Eccles, 2005). In this way, the choice is, on the one hand, affected by the value attributed to the profession, which depends on enjoyment or perceived usefulness, and, on the other hand, by expectations of success, which depend on beliefs about the profession and the perception of self-efficacy in the performance of the task, both of which in turn relate to prior experiences and their interpretation (Watt et al., 2012). Figure I shows the model, with a dimension of academic antecedents and social influences that can shape beliefs about the profession, perceived self-efficacy, motivations and the possibility of having chosen an alternative profession. The model distinguishes between intrinsic motivations, personal utility motivations and social value motivations. It also includes a factor relating to perceptions of the

profession relating to its difficulty and professional demands as well as possible benefits (salary, status, etc.). Finally, it considers a factor relating to self-perceived teaching ability. This model is the theoretical basis of the FIT-Choice (Factors Influencing Teaching Choice) instrument for measuring motivation.

FIGURE I. FIT-Choice Theoretical Model.



Source: Adapted from Watt & Richardson (2007)

FIT-Choice has a total of 18 subscales grouped into four second-order factors: personal utility value, social utility value, high demand and task return. The first two refer to motivational aspects and the second two to beliefs about the profession. In turn, the antecedents scales also refer to motivations (previous teaching–learning experiences and social influences) and beliefs (social dissuasion and satisfaction with choice).

The systematic reviews performed up to now justify the interest in studying this instrument, and the international scope of its use is especially interesting. FIT-Choice is used in 10 of the 41 articles in Heinz's (2015) review and in 17 of the 70 works reviewed by Fray and Gore (2018). Spain is one of the countries it has been used in, where Gratacós and López-

Jurado (2016) have validated it. The application of this questionnaire to very diverse populations has not only resulted in adaptations associated with translating it into other languages but also changes to the structure, items and original dimensions, changes that make a global study of its psychometric characteristics necessary. Accordingly, the present work focusses on the general reliability of FIT-Choice and seeks to summarise quantitatively the reliability results obtained in educational research that has applied this instrument as well as analysing the factors associated with it. As specific objectives, therefore, we intend to:

- Describe the characteristics of the instrument and the sample that the different studies have used.
- Estimate the mean reliability of the scales of the instrument across different studies
- Identify the effect of possible factors associated with reliability variance between different pieces of research (type of adaptation of the instrument, type of teacher evaluated, average age or percentage of women in the sample).

Method

To achieve our objectives, we used the reliability generalisation (RG) meta-analytic method (Vacha-Haase, 1998). In general terms, reliability in classical test theory (CTT) is defined as the amount of variance in answers that does not result from measurement errors. Cronbach's alpha coefficient is one of the most commonly used procedures for estimating this.

RG meta-analysis is growing in importance and is a form of systemic review that overcomes the measurement problems present in primary studies (Greco et al., 2018). Graham et al. (2011) identify three types of application of this sort of meta-analysis: 1) estimating the average score reliability for the measurements used between different studies, 2) studying factors at play in the variance of reliability between different studies, and 3) answering the question of how reliable the scores obtained are in studies with different samples and characteristics.

This technique starts with the reliability figures of the different studies to calculate the central tendency and variability of the indices, which are analysed using a specific methodology since as Rodríguez

and Maeda (2006) note, the distribution of reliability coefficient scores does not have the same properties as the distribution of effect sizes used in traditional meta-analyses. Although there are various analysis strategies, in this work we have opted for a random effects model with a weighted transformation of the alpha coefficients, including variability data to consider the possible effect of the heterogeneity of the sample on the reliability estimation. This random effects model is recommended by Botella et al. (2010) and Sánchez-Meca et al. (2013) owing to its greater capacity for generalising conclusions and because it is the best way of drawing inferences about reliability as it makes estimating the effects of different sources of variation possible.

Search strategy and selection of studies

We performed the search for articles on 6 July 2020 in the following international data bases: the main collection of *Web of Science* (WoS), the database of the *Education Resource Information Center* (ERIC), *Scopus*, *Google Scholar* and Dialnet. We used FIT-Choice and *Factors Influencing Teaching Choice* as search terms and we did not set a time limit. We searched in the "default" field of ERIC and Dialnet, the "topic" field of WoS, the "title, abstract and keywords" field of *Scopus* and the "title" field of Google Scholar. This last database only allows the search to be limited to the title field, and not the title, abstract and keywords field or default fields. The following search function was used[2]:

*("fit choice" OR "fit*choice" OR "factors influencing teaching choice")*

We also consulted the leading international repositories of doctoral theses: DART-Europe and *Open Access Theses and Dissertations*.

The literature search enabled us to retrieve 261 documents: 62 records from WoS, 50 from ERIC, 79 from *Scopus*, 5 from Dialnet, 53 from *Google Scholar*, 1 from DART-Europe and 11 from *Open Access Theses and Dissertations*. We also found two articles from other sources. After eliminating 100 duplicate texts, we performed an initial review of the

(2) When searching in *Google Scholar*, we eliminated truncation to avoid retrieving irrelevant documents.

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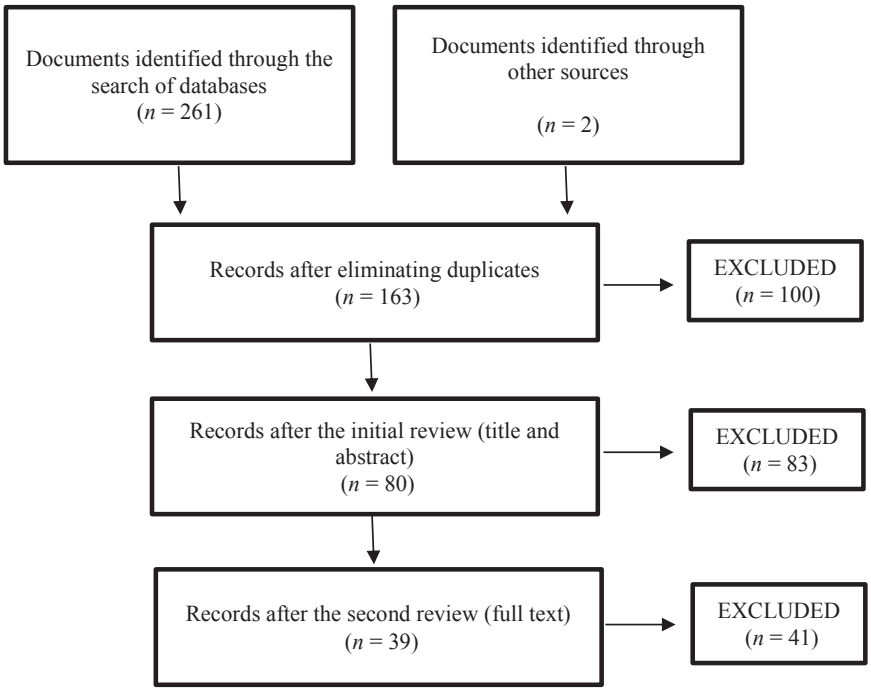
remaining 163 works based on the title and abstract. This review enabled us to reject 83 texts that did not analyse the psychometric properties of FIT-Choice (different topic or theoretical studies) or were published in a language other than Spanish or English. This initial selection was done by two independent researchers, with a 94% agreement level. We evaluated the 80 works selected in this first phase by reading the full text. This enabled us to reject 41 works, primarily because they did not provide information about the reliability of FIT-Choice or because they referred to values reported by other works that we had already included. Figure II summarises the process described.

FIGURE II. Flow chart of the study selection process



On the basis of this, we analysed a total of 39 studies, which as a group provide information about the psychometric properties of FIT-

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Choice after its application to 48 samples of different subjects. Table I shows the criteria used for coding these studies.

Coding

As well as the descriptive information about the studies and samples, we characterised the FIT-Choice instrument by first considering the type of scale used, differentiating between use of the original instrument validated by Watt and Richardson (2007) and modified versions of it, whether these modifications involve reducing the scale, changing the construct or adapting it to another language. We also specify whether the study validates the scale as one of its main aims or as a preliminary study to justify its use, also noting whether they do not do so, do so through a reliability study alone or use exploratory and confirmatory factorial methods. In the case of studies that use translations of the instrument, the language in question is also noted. Finally, the information needed to be able to carry out the quantitative summary of reliability is given: a) Cronbach's alpha (in two studies they were figures about composite reliability obtained with the factorial scores in a confirmatory study), b) the number of items in each scale and c) the standard deviation of the sample.

Some of the works that adapt the model propose a new structure for organising dimensions. In these cases, the name of the new factor is added along with the previous information.

TABLE I. System for the coding of articles

	Variable	**Labels**	**Type**
1	Identifier		Chain
2	Author(s)		Chain
3	Year of publication		Numerical
4	Title of the document		Chain
5	Type of publication	1. Article 2. Book 3. Doctoral thesis 4. Research report 5. Others	Numerical
6	Title of publication		Chain
7	Language of publication		Chain
8	Keywords		Chain
9	FIT-Choice (type of scale)	1. Original (Watt & Richardson, 2007) 2. Scale that adapts the dimensionality of the construct 3. Translated scale 13. Original and translated 23. Adapted scale (translation + dimensionality)	Numerical
10	Validation study	1. No 2. Yes, reliability only 3. Yes, with exploratory factorial methods 4. Yes, with confirmatory factorial methods	Numerical
11	FIT-Choice Language		Chain
12	Type of teacher	1. Early years 2. Primary 3. Secondary 4. Language teacher 12. Early years and primary 13. Early years and secondary 23. Primary and secondary 123. Early years, primary and secondary	Numerical

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13	Country	In studies that compare various countries, each one is included as one sample.	Chain
14	Sample size	Total number of cases	Numerical
15	*n* women	Frequency or percentage	Numerical
16	Age	Average age of sample	Numerical
17	Teaching activity	1. Pre-service teacher 2. Practising teacher	Numerical

The final selection includes information from over 29,640 teachers (7.7%) and pre-service teachers (92.3%). The mean age is 26.18 years and 66% of them are female. These works were published in the 2007–2020 period, with 2012 and 2019 being the years with the most works (37.5% and 16.7% respectively). Most of the documents are articles (87.5%), followed by doctoral theses (8.3%) and books (4.2%). More than 93% of the works (n = 45) are written in English, compared with 6% in Spanish (n = 3). The studies were mainly carried out in the USA (18.8%), Switzerland (12.5%) and Turkey (10.4%).

Data analysis plan

Firstly, as the normality of the distribution of the alpha coefficients across the different studies cannot be assumed, we applied the transformation proposed by Bonett (2010):

$$L_i = \ln(1 - \alpha_i) \quad (1)$$

Where is the reliability coefficient of each study i. The variance of this transformation is estimated using formula 2:

$$Var(L_i) = \frac{2q_i}{(q_i - 1)(n_i - 2)} \quad (2)$$

Where q is the number of items on the scale in the study i and n the effect size used. The transformed results are then weighted by the inverse of the variance, which in a random effects model has two terms: Var(Li) and τ^2, that is, the intra- and inter-study variability. As variance between studies is an unknown parameter, it is estimated based on the information about reliability provided by the research works analysed by

the Dersimonian-Laird method (Sánchez-Meca et al., 2013). Finally, once weighted, to facilitate their interpretation as alphas, the transformation is reversed.

We tested homogeneity using Cochran's Q test (Hedges & Olkin, 1985) and calculated the proportion of heterogeneity using I^2 (Higgins & Thompson, 2002), which is classed as high above 0.75.

We calculated the effect of moderator variables using meta-regression. Finally, we tested for publication bias using Egger's regression test, where non-significant values indicate an absence of bias.

Moderator variables

To study the effect of contextual variables on the variability of the reliability coefficients, we used the following variables from Table I as moderators: 9, 10 and 11 (relating to adaptations to the instrument) and 12, 15, 16 and 17 (relating to the sample). With the objective of verifying the independent effects of the groups of cases represented in the different moderator variables, we dichotomised them so that they could be included as separate predictors in the regression analysis. All of the analyses were done using the *Jamovi* software program (2020) and the *metafor* package (Viechtbauer, 2010) for R.

Results

In response to the first specific objective, the selected studies and their characteristics are summarised in Table II

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TABLE II. Studies finally included after the systemic review process

ID	Study	no. of samples	Type of scale	Validation study	Type of teacher	Teaching activity	Fit-Choice language
43	Alpaslan et al. (2018)	1	2	1	3	1	English
61	Akpochafo (2020)	1	23	1	23	1	Turkish
21	Berger & D'Ascoli (2012a)	2	3	4	3	2	German and French
105	Berger & D'Ascoli (2012b)	2	23	1	3	1	German and French
146	Berger & Girardet (2020)	1	3	4	3	2	English
81	Choi S., & Song J. (2015)	1	23	1	23	1	English
125	de Zordo et al. (2019)	1	3	1	12	1	English
59	Eren & Tezel (2010)	1	3	4	4	1	Turkish
13	Fokkens-Bruinsma & Canrinus (2012a).	1	23	4	2	1	Dutch
133	Fokkens-Bruinsma & Canrinus (2012b).	1	3	2	3	1	Dutch
86	Fokkens-Bruinsma & Canrinus (2014)	2	3	1	23	1	Dutch
63	Goller et al. (2019)	2	3	4	12	1	German and Finnish
143	Gratacós & López-Jurado (2016)	1	3	4	12	1	Spanish
23	Heinz et al. (2017)	1	1	1	3	1	English
2	Hennessy & Lynch (2017)	1	2	3	3	1	English
46	Jablanovic & Vracar (2019)	1	1	1	123	1	English
85	Jugovic et al. (2012)	1	3	4	2	1	Croatian
58	Kilinc et al. (2012)	1	3	4	23	1	Turkish
102	Konig & Rothland (2012)	1	3	4	23	1	German

51	Lawver (2009).	1	1	1	3	1	English
15	Lawver (2012)	1	1	1	3	1	English
76	Lin et al. (2012)	2	13	4	23	1	English and Chinese
26	MacKenzie (2013)	1	1	1	23	1	English
91	Nesje et al. (2018)	1	3	4	23	1	Norwegian
164	Ozturk-Akar (2012)	1	3	4	3	1	Turkish
14	Ozturk-Akar (2019)	1	23	1	3	1	Turkish
96	Ponnock (2018)	1	2	4	123	1	English
80	Ridgewell (2018)	1	1	4	2	2	English
48	Said-Hung et al. (2018)	1	3	1	23	1	Spanish
3	Silvestre et al. (2020)	1	3	4	123	1	Spanish
126	Suryani et al. (2016)	1	23	4	123	1	Indonesian
128	Taimalu et al. (2017)	1	23	4	123	1	Estonian
165	Topkaya & Uztosun (2012)	1	2	4	4	1	English
138	Torsney et al. (2019)	1	2	4	2	1	English
94	Van Overschelde & Garza (2019)	1	2	4	3	1	English
75	Wang (2019)	1	1	4	23	1	English
97	Watt & Richardson (2007)	2	13	4	23	1	English and German
101	Watt et al. (2012)	4	1	4	123	1	English
154	Zhang et al. (2020)	1	23	4	4	1	Chinese

The majority of the research works analyse a single sample (82%). The rest compare the results of 2 groups (15.4%) or in one case four different samples. With regards to educational stages, secondary education teachers participate in 30.8% of the studies, primary and secondary education teachers in 28.2%, teachers from all three stages (early years, primary and secondary) in 15.4% and primary education teachers in 10.3%. In

combination with this, around 7.7% of the studies refer to mixed samples of early years and primary and 7.7% to language teachers.

The texts use samples mainly comprising pre-service teachers (92.3%). Only three articles (7.7%) include active teachers.

In 20.5% of the works, the original version of Fit-Choice was used (Watt & Richardson, 2007). A further 5% used the original version along with a translation, compared with 15.4% where an adaptation of the dimensionality of the construct is carried out, 38.4% in which the language is adapted and 20.5% in which both dimensionality and language are adapted. Of the studies, 66.6% perform some kind of psychometric study, with the majority (61.5%) applying confirmatory factorial techniques. The selected research works cover the use of the scale in 12 different languages, with English (41.7%), German (10.4%), Turkish (10.4%) and Estonian (10.4%) being most frequent.

With regards to the **second specific objective**, Table III presents the results of the meta-analysis for the 18 subdimensions, the four second-order factors and the motivation and belief constructs that correspond to the original FIT-Choice structure.

TABLE III. Results of the meta-analysis of generalisation of reliability by subdimensions, dimensions and constructs of FIT-Choice

		Reliability						Heterogeneity			Egger's Regression	
	k	F	SE	Z	P	LL	UL	I^2	Q	p	Value	P
M1 Perceived teaching ability	40	0.814	0.006	129	<.001	0.801	0.826	85.73%	273.256	<.001	-1.783	0.075
M2 Job security	35	0.829	0.008	98.9	<.001	0.813	0.846	96.09%	870.524	<.001	-0.293	0.77
M3 Time for family	35	0.83	0.007	125	<.001	0.817	0.843	91.31%	391.334	<.001	-0.508	0.611
M4 Job transferability	22	0.674	0.02	34.1	<.001	0.636	0.713	94.13%	357.953	<.001	-0.462	0.644
M5 Intrinsic value	39	0.741	0.015	48.4	<.001	0.711	0.771	97.06%	1293.724	<.001	-2.14	0032
M6 Fallback career	32	0654	0018	36.2	<.001	0618	0689	90.89%	340289	<.001	-0624	0533
Personal Utility (2nd order)	**11**	**0817**	**0019**	**42.5**	**<.001**	**0779**	**0855**	**96.18%**	**261.71**	**<.001**	**0.82**	**0412**
M7 Shape future	24	0788	0014	56.7	<.001	0.76	0815	97.84%	1062.58	<.001	0345	0.73
M8 Social equity	33	0814	0.01	83.3	<.001	0795	0833	96.71%	973112	<.001	-1.05	0294
M9 Social contribution	32	0796	0009	84	<.001	0778	0815	96.07%	788034	<.001	-0926	0354
M10 Working with children	37	0891	0005	189	<.001	0882	0901	95.83%	863066	<.001	-1921	0055
M11 Prior teaching–learning experience	38	0846	0006	146	<.001	0835	0858	94.62%	687562	<.001	-0738	0.46
M12 Social influences	40	0837	0011	73.4	<.001	0814	0859	97.18%	1384.538	<.001	0895	0371
Social Utility (2nd order)	**12**	**0824**	**0018**	**45.9**	**<.001**	**0788**	**0859**	**97.37%**	**418608**	**<.001**	**-0629**	**0529**
MOTIVATIONS (construct)	**44**	**0803**	**0007**	**109**	**<.001**	**0788**	**0817**	**93.81%**	**694197**	**<.001**	**-0442**	**0659**
C13 Expert career	29	0775	0001	77.9	<.001	0756	0795	96.12%	722167	<.001	-2028	0043
C14 High demand	33	0693	0015	46.5	<.001	0663	0722	96.28%	859354	<.001	-2001	0045
High demand (2nd order)	**8**	**0728**	**0037**	**19.7**	**<.001**	**0655**	**0801**	**97.03%**	**235922**	**<.001**	**1.45**	**0147**
C15 Social status	35	0853	0005	167	<.001	0843	0863	94.35%	601848	<.001	-3088	0002
C16 Good salary	32	0878	0008	105	<.001	0862	0894	98.51%	2087.421	<.001	1817	0069
Task return (2nd order)	**5**	**0755**	**0044**	**17**	**<.001**	**0668**	**0842**	**98.56%**	**278595**	**<.001**	**0652**	**0514**
C17 Social dissuasion	36	0711	0011	65.9	<.001	0.69	0732	91.77%	425129	<.001	0237	0813
C18 Satisfaction with choice	31	0879	0007	124	<.001	0865	0893	98.43%	1913.813	<.001	-2844	0004
BELIEFS (construct)	**37**	**0783**	**0008**	**98.1**	**<.001**	**0767**	**0799**	**95.06%**	728631	<.001	-1755	0079

k = number of studies; F= average reliability; SE = standard error; LL = lower limit; UL = upper limit; P = associated probability

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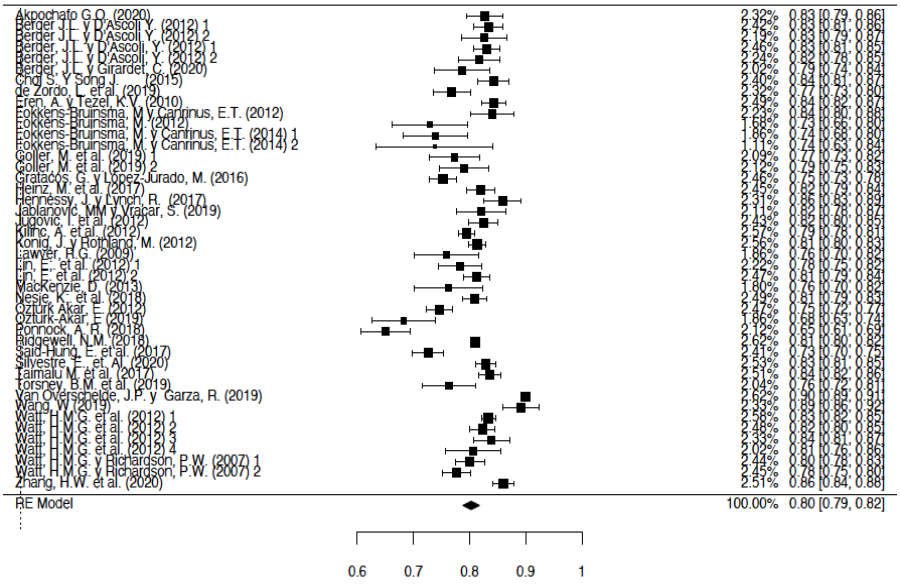
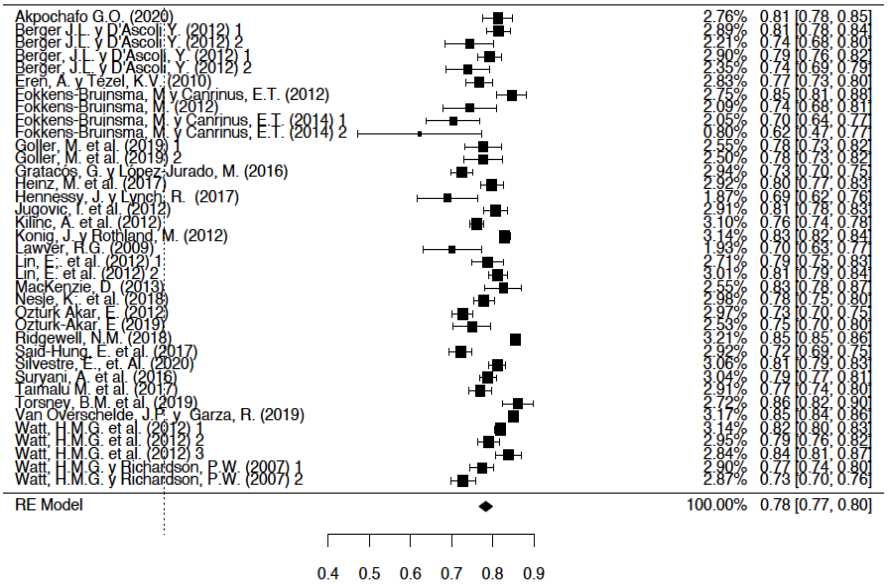
Of the 12 subdimensions that relate to teacher motivation (from M1 to M12), 7 (58.33%) display good reliability, 3 (25%) have acceptable values and the reliability of the other two (16.66%) is questionable, that is to say, it is below .7 (M4 and M6). In any case, it is worth noting that in general terms the "personal utility" and "social utility" dimensions and the "motivations" construct have reliability values that can be regarded as good (mean reliability of 0.8). Figure III shows the average reliabilities of each study that provides data relating to the motivations construct, along with their respective confidence intervals.

FIGURE III. *Forest plot* of the "motivations" construct



In the case of the "beliefs" construct, average reliability is close to 0.8. The "high demand" dimension and, in particular, one of its subdimensions (C14) have the worst psychometric properties. For their part, the reliabilities of the C15 and C16 subscales associated with the "task return" dimension can be regarded as good. Figure IV shows the variability of the estimated reliability for this construct in the different studies that provide data in this regard.

FIGURE IV. *Forest plot* of the "beliefs" construct



Regarding the heterogeneity in the psychometric properties reported by the different studies, the I^2 values, which are greater than 75% in all of the subdimensions and dimensions of the scale, and the probabilities associated with the Q statistics, which are lower than 0.01, reflect significant differences in the reliability values obtained when using FIT-Choice with different groups of subjects. This heterogeneity is shown in Figures III and IV, where the intervals for the average reliabilities of the scales are easily identifiable.

It is also important to note that possible publication bias, evaluated using Egger's regression test, occurs in five subdimensions (M5, C13, C14, C15, and C18) and in the second-order factors. This problem primarily affects the beliefs scales and so these results should be interpreted with caution.

To achieve the **third specific objective**, we estimated models that include moderator variables linked to the characteristics of the instrument and to the samples used. Firstly, the effect of the dispersion of the scores on the reliability results is analysed. This dispersion affects reliability

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in M5 (Z=2.93; p=0.003), M8 (Z=3.17; p=0.02), M11 (Z=2.30; p=0.021), C13 (Z=2.37; p=0.018) and C15 (Z=3.24; p=0.001). Next, the effect of the type of FIT-Choice and of the samples is considered. In the first case, the results are presented below by subdimensions:

- In subscale M2, the test translated into German has a positive effect (Z=2.04; p=0.041).
- In M5, use of a translated version of the instrument does not appear to be problematic (Z=2.48; p=0.013). Even the test in its original language (English) displays a negative effect in reliability (Z=-2.03; p=0.043). In the works that use this scale without the aim of performing some type of validation of the instrument, there is a negative effect (Z=-2.26; p=0.024), including when the work attempts to validate the instrument using only a reliability study (Z=-2.10; p=0.036). In contrast, in studies that use confirmatory analysis techniques to study validity, the effect is positive (Z=2.90; p=0.004).
- In subdimension M6, in works that do not include validation there is a negative effect on reliability (Z=-2.23; p=0.026).
- In M7, the change of construct with regards to the original model has a negative effect (Z=-2.26; p=0.024) and use of the test in the original language displays a positive effect on reliability (Z=2.74; p=0.006).
- In M8, using the test in the original language displays a possitive effect (Z=2.07; p=0.039).
- In M10, the change of construct with regards to the original model has a positive effect (Z=2.26; p=0.024). If the study is not a validation study, the effect is negative (Z=-4.61; p<0.001). This is also the case if a translated version of the instrument is used (Z=-2.03; p=0.043)
- In subscale C16, the translation into German has a positive effect (Z=2.61; p=0.009). In contrast, the Spanish translation has a negative effect on reliability (Z=-2.09; p=0.036).
- And in C18, a negative effect is observed (Z=-3.57; p<0.001) if the work does not have the aim of validating the instrument. In contrast, confirmatory studies have shown a positive effect on reliability (Z=3.78; p<0.001).

Finally, in the personal utility second order factor, the test translated into German has a positive effect (Z=2.53; p=0.011).

In addition, to present the sample characteristics that can affect the variability, the results are grouped by variables.

The teacher training specialism displays significant effects on the reliability of some scales. Primary school teachers have a positive effect on the reliability of the beliefs scale (Z=2.17; p=0.03). The sample of secondary school teachers determines the reliability results for subscale M4 (Z=-2.37; p=0.018), M10 (Z=-2.52; p=0.01) and C18 (Z=-2.99; p=0.003). The sample of language teachers has a positive effect on M6 (Z=2.69; p=0.007), M10 (Z=2.58; p<0.01) and C17 (Z=2.62; p=0.009). In contrast, the effect is negative on the second order factor of social utility (Z=-2.54; p=0.011) and on subdimension C13 (Z=-3.59; p<0.001).

Using a mixed sample of teachers from early years and secondary has a negative effect on the results of subscale M6 (Z=-2.04; p=0.042) and the second order factor of task demand (Z=-2.47; p=0.013). Using a mixed sample of teachers from early years and primary has a negative effect on M7 (Z=-3.18; p=0.001), M8 (Z=-2.16; p=0.031) and M9 (Z=-2.58; p=0.01). The mixed sample of primary and secondary has a negative effect on M6 (Z=-2.18; p=0.030) and a positive effect on the second order factors of personal utility (Z=1.98; p=0.048) and social utility (Z=2.52; p<0.012), on the general motivations construct (Z=2.02; p<0.044) and on the estimation of the total reliability for the beliefs scale (Z=2.96; p=0.003) as well as on subscale C18 (Z=3.11; p=0.002).

The sample comprising students has a negative effect on reliability in subscales M6 (Z=-2.78; p=0.05), M8 (Z=-2.05; p=0.041), C16 (Z=-2.09; p=0.036) and C18 (Z=-2.03; p=0.042).

Finally, the age of participants has a positive effect on variables M7 (Z=2.41; p=0.016), M8 (Z=3.17; p=0.02), M9 (Z=2.11; p=0.034) and C16 (Z=2.03; p=0.043); it negatively affects the second-order social utility factor (Z=-2.50; p<0.012) and the high demand factor (Z=-2.50; p=0.012).

Discussion and conclusions

Given the current concern about teachers' efficacy, it is of interest to establish whether similar factors explain the choice of teaching as a career in all countries. To do this, measurement instruments are needed that have validated reliability in international studies and therefore allow this comparison. FIT-Choice, designed in 2007 and initially validated for

a sample of 1653 Australian students (Watt & Richardson, 2007) has been confirmed to be a useful tool for this objective following its long history of applications.

The present study has set out to analyse, compare and synthesise quantitatively the reliability of the FIT-Choice scale following its use with various international samples to measure the motivations and beliefs of pre-service teachers and practising teachers. Given that it is an extensively used instrument, it is appropriate to reflect on its internal consistency, through a systematic review and a meta-analysis of generalisation of its reliability. The results obtained reflect significant heterogeneity in its reliability, which is adequate on the whole, although differential psychometric behaviour is observed in some of its dimensions and subdimensions. In general terms, the personal utility and social utility dimensions and the motivations construct have reliability values that can be regarded as good (mean reliability of 0.8). In contrast, the beliefs construct and its subdimensions have a mean reliability close to 0.8, except for subscale C14, high demand, which is below 0.6.

The creators of the questionnaire argue that the instrument allows for international comparison of motivations for pursuing a career in teaching. Watt et al. (2012) analyse results from Australia, the USA, Norway and Germany and conclude that the dimensions structure is stable between countries, although beliefs linked to the profession vary considerably. Their findings led them to reject the "job transferability" and "fallback career" subscales (M4 and M6) owing to their low reliability. The results of this meta-analysis show that the personal utility scale and good salary have greater reliability in the German version of the instrument. Nonetheless, the estimation of the good salary of the profession is less reliable in the Spanish version, which is also used in Latin America.

The results indicate that the scale relating to choosing this career to help social equity is more reliable in the original English version, although it is also more affected by the dispersion of scores. This could suggest that the scale has different meanings according to the context, and so it should be adapted to each situation. This limitation already appears in the previous meta-analyses. One possible explanation, as the authors of expectancy-value theory (Klassen et al., 2011) noted, is that quantitative instruments can conceal cultural differences in these motivations because they assume that the ones that are dominant in Western countries are in other settings as well. In future, it would be

advisable to perform a systematic review of works that consider the theory that explains these differences between cultures or types of teacher. It would also be desirable to perform a meta-analysis of differences of means between groups (the West compared with others), educational level (early years, primary, secondary), pre-service teachers compared with practising teachers and educational stage. Furthermore, the sample of studies could be expanded by including works that apply other types of instrument.

One complicating factor when studying the overall reliability of FIT-Choice is the dimensionality of the construct. Contextual differences could be the root of the variations in the structure of dimensions observed, which would require further study. These modifications normally relate to the combination of scales and at other times involve the addition of new dimensions. For example, the work of Suryani et al. (2016) incorporates a new religious influences scale and another to identify dissuasion caused by the media. Van Overschelde and Garza (2019) include a motivational dimension of the choice of the profession to contribute to social change, combining items from the social utility value scales; and Zhang et al. (2020) define an extrinsic value scale. Akpochafo's work (2020) groups together the skill and intrinsic motivations dimensions on the one hand and contextual antecedents with scales of motivations on the other (such as prior teaching–learning experiences with choosing the profession to make a social contribution or the social influence with job security). The works by Berger and D'Ascoli (2012a & 2012b) combine scales that relate to social utility, such as helping shape the future or making a social contribution, while also adding new dimensions such as constructivist beliefs and direct transmission beliefs. Overcoming the limitation of the heterogeneity observed in the dimensionality of the construct raises the possibility of a meta-analysis of construct validity as future work.

Despite the existing difficulties, with the meta-analysis carried out, complemented by the study of the effect of the selected moderator variables, this work represents an important step towards elucidating the metric properties of FIT-Choice, which is an instrument with international scope. It also makes a contribution on the line deriving from the meta-analysis by Heinz (2015), which recommends greater depth in comparative studies of motivations for choosing a career in teaching as these could vary by profile. The average reliability figures found support the usefulness of the questionnaire and its value not only

as a tool for comparative study of the motivations and beliefs involved in the choice of teaching as a profession in international studies but also as an appropriate instrument for research into the dimensionality of a construct that is as complex as it is interesting.

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Admission Test Model for Pre-service Teacher Training Courses Based on a Participatory Design Approach

Modelo para las pruebas de admisión a los estudios de maestro a partir de un proceso de diseño participativo

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Abstract

This paper describes and presents the design, development and implementation process of an *ad-hoc* test for student admission to pre-service teacher training bachelor's degrees (both early childhood and primary education). Admission tests for teaching training courses were designed and validated over several years through a participatory methodology involving over 500 participants. The tests were proposed within the framework of a programme aimed at establishing and applying various measures to improve initial teacher training at the University of the Balearic Islands. The final result of the process is a model for the design and implementation of admission tests from a participatory perspective that may be useful for the development of similar tests at other universities.

Keywords: Teacher education, initial training, admission criteria, participatory research, teacher recruitment, teaching profession.

Resumen

En este trabajo se presenta el proceso de diseño, elaboración e implementación de unas pruebas de admisión ad-hoc para el ingreso de alumnado a los Grados de Maestro. A lo largo de varios cursos, mediante una metodología participativa y con la implicación de más de 500 participantes, se proyectaron y validaron unas pruebas de admisión para acceder a los Grados de Educación Primaria e Infantil. Estas pruebas se plantearon en el marco de un programa orientado a establecer y aplicar diversas medidas para la mejora de la formación inicial docente en la Universidad de las Islas Baleares. El resultado final del proceso es un modelo para el diseño y la implementación de unas pruebas de admisión desde una perspectiva participativa que puede ser de utilidad para la elaboración de pruebas similares en otras universidades.

Palabras clave: Formación de profesores, formación inicial, criterios de admisión, investigación participativa, selección del profesor, profesión docente.

Introduction

Nearly all countries set criteria for admission to teacher training studies, whether through a general system used for all courses (mainly based on high-school grades and university entrance exams) or through a specific procedure with supplementary requirements to the general admission criteria (Egido-Gálvez, 2020; Eurydice, 2018). The first option is the most common both internationally and in Spain. However, 21 Spanish universities (five public and 16 private) use some type of specific test. In terms of what these tests cover, ten universities exclusively focus on cognitive aspects (five public and five private); two solely run non-cognitive tests; and nine private universities combine cognitive and non-cognitive tests. At this time, no public university assesses non-cognitive abilities (Manso 2019, Generalitat de Catalunya, 2021 and Universidad de Deusto, 2021).

The main reasons given to justify setting selective criteria for admission to teacher training degrees are equity, social justice, market saturation and improving course quality (Holden and Kitchen, 2017). The latter argument is the most common in Spain. It appears repeatedly in highly diverse documents which, in recent years, have agreed on the need to re-think the entry system for initial teacher training. These documents have

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emerged from reflections by different academic institutions (Conferencia de Decanos/as de Educación, 2017), analyses by professional associations and groups (Foro de Sevilla, 2014; REDE, 2018; Grupo Palma, 2018) and results from government-led forums (Marina, Pellicer and Manso, 2015; Ministerio de Educación y Formación Profesional, 2018).

With regard to research on the topic, current reviews (Menter, Hulme, Elliot and Lewin, 2010; Parker, 2018) highlight that the issue of Admission Tests (AT) is one of the least studied in the area of initial teacher training. Generally, these reviews have focused on analysing admission models in different countries and putting recommendations forward for their implementation (Casey and Childs, 2007; Martínez-Martin, Prats-Gil and Marín-Blanco, 2015; Klassen, Dolan and Afzal, 2015; Childs and Ferguson, 2015; The Australian Secondary Principals' Association, 2015; Darmody and Smyth, 2016; Holden and Kitchen, 2017; Egido-Gálvez, 2020; Pérez-Granados, 2015, 2018). Further guiding principles include how to set criteria for the tests, how they are implemented and their effectiveness or predictive ability for professional success (Corcoran, 2000; Corcoran and O'Flaherty, 2018; Katz and Frish, 2016; Mikitovics and Crehan, 2002; Wright, 2015).

Selecting candidates for initial teacher training continues to be a challenge both in terms of policy and educational research: it is not easy to identify applicants whose personal attributes enable us to foresee them having greater potential for success in their initial training and subsequent professional career. In turn, establishing selective tests or not is an axiological issue that lies outside the evidence that educational research can provide.

In this context, it should be highlighted that the production process for this type of test from a participatory design perspective has not been undertaken previously. This approach is likely to improve efficiency and effectiveness in educational change processes (Janssen, Könings and van Merriënboer, 2017), and has been shown to be relevant in different areas of education (Simonsen and Robertson, 2013; Bustamante, Brendel, Degbelo and Kray, 2018; Könings, Bovill and Woolner, 2017).

Thus, with the goal of improving bachelor's degree courses in early childhood and primary education (GIP), the Faculty of Education at the *University of the Balearic Islands* (UIB) began a participatory process in 2013 that focuses on designing, validating and implementing an *ad hoc* AT for these courses. This article analyses this process and its results.

Method

The general aim of this work is to describe and analyse the AT production process on the Early Childhood and Primary Education Degrees at the UIB from a participatory design approach (Abu-Amsha, Gordon, Benton, Vasalou and Webster, 2019; Engelbertink, Kelders, Woudt-Mittendorff and Westerhof, 2020). Different procedures were undertaken throughout this process aimed at: (1) exploring and identifying problems; (2) reflection and action; (3) planning based on critical contributions and, finally, (4) designing prototypes. The specific aims of the work are set out in Table I. All these aims led to a three-phase strategy: pre-design, design and post-design (see Table I).

With regard to the type and number of participatory strategies used throughout the process, we should highlight that two Delphi panels (Diamond, Grant, Feldman, Pencharz, Ling, Moore, Wales, 2014), four workshops (Lee, Leong and Chan, 2015; Nickelsen y Bal, 2021) and three work teams (WT) (Bayona and Heredia, 2012) were organised. Finally, two validation processes were performed: a context analysis and a literature review from a systematised perspective (Alexander 2020; Codina, 2018).

TABLE I. Objectives, strategies and participants in each of the design process phases

PHASES	SUB-PHASES	OBJECTIVES	STRATEGIES	PARTICIPANTS
Phase 1. Pre-design	1.1. Exploring and identifying problems	- Analysing the status of initial teacher training in the Balearics	- Context analysis of initial teacher training	- Research team
		- Determining measures to improve initial teacher training in the Balearics	- Delphi panel-1 (5 rounds)	- 28 lecturers from the Department of Pedagogy at the UIB that teach most GIP classes
			- Delphi panel-2 (3 rounds)	- 128 lecturers from different departments that teach on the GIP and 157 teachers-placement tutors at schools
	1.2. Agreed strategic design based on reflection	- Designing a collaborative programme to improve initial teacher training	- Work team-1: producing an intervention proposals document	- 28 lecturers from the Department of Pedagogy at the UIB who teach most on the GIP and consultation with all course lecturers

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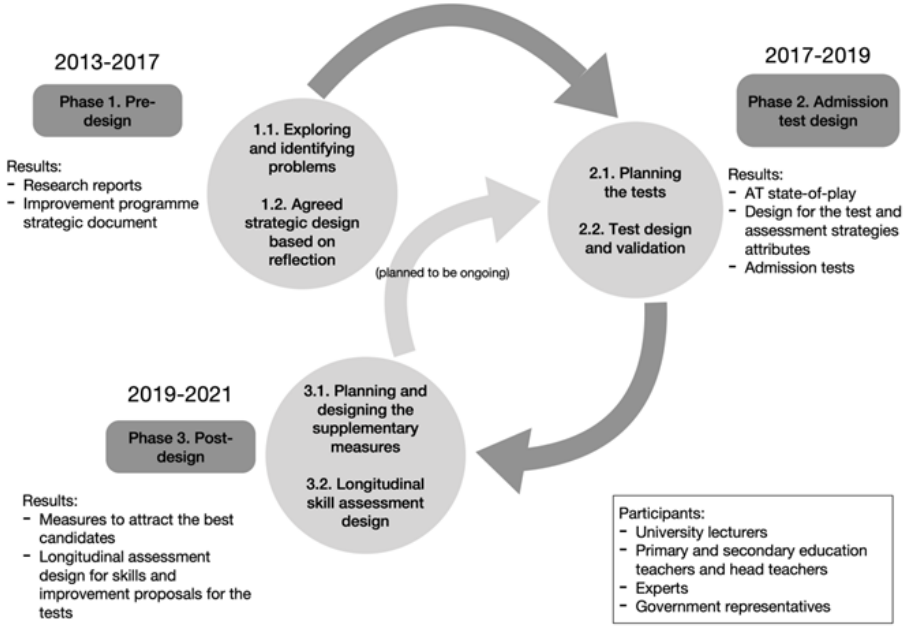
Phase 2. Design.	2.1. AT planning	- Producing a scientific literature review on the topic	- Systematic review of admission tests and criteria	- Research team
		- Determining the purpose, attributes and assessment tools for the AT	- Workshop 1 and 2 on analysing two key experiences	- Research team with: a team from the Finnish Institute for Educational Research (Workshop-1) and a team from the MIF programme in Catalonia (Workshop-2)
			- Workshop-3 on the purpose and attributes of the test	- 41 specialists from five Spanish universities; teachers and head teachers from early childhood and primary education centres, and representatives from government education bodies
	2.2. AT design and validation	- Designing and validating the AT	- Work team-2**:** initial and final test design	- 12 university lecturers and 2 teachers
			- Validation-1 (internal and external)	- 13 experts (university lecturers and teachers) - 10 teachers, counsellors and heads from secondary education centres - 107 baccalaureate and VET students
Phase 3. Post-design	3.1. Planning and designing supplementary measures to attract the best candidates	- Planning and designing supplementary measures to attract the best prepared and most motivated candidates	- Workshop-4 on 'Defining supplementary measures for admission tests'	- 39 specialists (university lecturers and working teachers)
	3.2. Designing a longitudinal assessment study of the skills shown in the tests and their evolution during the GIP degree programmes	- Designing an assessment system of student skills to assess the predictive validity of the AT	- Work team-3: designing the assessment system	- Research team
			- Validation-2 by experts	- 13 experts (university lecturers and teachers)

Source: Prepared by the authors

Results

This section sets out the dynamic and main results of each of the three phases for the process followed.

FIGURE I. AT planning cycle and main results from the phases



Source: Prepared by the authors

Phase 1. AT pre-design (2013-2017)

Exploring and identifying problems

After a highly detailed analysis of the status of initial teacher training in the education system of the Balearic Islands and at the UIB (Sureda-Negre and Oliver-Trobat, 2015), and with a view to identifying agreed measures to improve courses, Delphi Panel-1 was organised with 28 participating department lecturers at the UIB who taught the most on the early childhood and primary education degree courses. This resulted in 14 proposed measures. 'Establishing selective admission criteria for courses' (Sureda-Negre, Oliver-Trobat, Comas-Forgas, 2016, p. 158) received the widest agreement.

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Afterwards, Delphi Panel-2 was organised with all UIB lecturers who had at least three years of teaching experience on the GIP courses: in total, 128 university lecturers from 11 departments and 157 teachers-placement tutors were invited to take part (Calvo-Sastre, Sureda-Negre and Oliver-Trobat, 2018). Consequently, 170 took part in the first round, 129 in the second and 149 in the third. This led to agreed improvement measures including 'that establishing more selective admission criteria would be a measure for greatly improving future teachers' training' (Sureda-Negre, Oliver-Trobat and Comas-Forgas, 2020, p. 85).

Agreed strategic design based on reflection

Based on the state-of-play in initial training within the context of experience, and after identifying agreed improvement measures (amongst university lecturers and teachers-placement tutors at schools), the Office of the Vice Chancellor at the UIB was called on to participate in the debate. This led to the creation of the *Improvement Programme for Initial Training on Primary and Secondary Teacher Training Courses (PM_FIP)*[1] (UIB, 2017b; Oliver-Trobat, Sureda-Negre and Calvo-Sastre, 2018).

With the framework of the PM_FIP, Work Team-1 drafted an initial 'Strategic and Intervention Proposals Document' (PM_FIP, 2017; UIB, 2017a) with the participation of 28 lecturers from a department on the early childhood and primary education degree courses. Six objectives were set out alongside their respective action lines and assessment indicators. Objective three included improving the admission system for the GIP degrees, which proposed designing and implementing an experimental student selection system.

Thus, the pre-design phase agreed on the suitability of producing ATs for initial teacher training as an improvement strategy for the early childhood and primary education degree courses.

(1) For further information, see: http://pmfip.uibvirtual.es/comissio/

Phase 2. AT design (2017-2019)

AT planning

Determining the purpose, attributes and assessment tools for the AT was approached in three workshops. Workshop-1, held in mid-2017, focused on analysing the Finnish model whilst Workshop-2, held in late 2017, analysed the *Teacher Training Improvement and Innovation Programme (MIF)* experience in Catalonia (Martínez-Martin et al., 2015).

Workshop-3 was held in May 2018 and was organised into four working groups. It focused on discussing the purposes of the ATs, their attributes and the assessment strategies. The participants included 41 specialists from five Spanish universities, teachers and head teachers from early childhood and primary education centres, and representatives from government education bodies.

A bibliographic review had been undertaken previously with a systematised research focus into programme admissions. Up to 22 databases were consulted and, based on different criteria (including only focusing on empirical studies published from 1980 onwards), 137 documents were selected. The resulting document was made available to the Workshop-3 participants so that they had an overview of the state-of-play for the topic when making decisions.[2]

AT purpose

It should firstly be noted that the ultimate purpose of the entire process was established in the pre-design phase. Both the results from the Delphi panels and the production of the PM_FIP made it clear that establishing selective criteria for admission to the GIP degree programmes was an important strategy for improving the courses. Nonetheless, it was deemed appropriate for Workshop-3 participants[3]—who had viewed the systematised literature review from the previous phase—to reflect on this purpose. The aim was to ascertain the reasons why implementing ATs could lead to an improvement in the degree programmes. The analysis

(2) The bibliography selection can be viewed at this link: https://bit.ly/2YqaQ6Y

(3) 41 specialists from five Spanish universities, teachers and head teachers from early childhood and primary education centres, and representatives from government education bodies took part.

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of the conclusions from the workshop working groups highlighted four broad core reasons:

- The need to identify and recruit the best candidates since places are limited (setting value)
- The advisability of not accepting unsuitable students for the programmes (suitability value)
- The need to design ATs based on academic (in terms of skills) and non-academic attributes (attribution value)
- The advisability of knowing candidate strengths and weaknesses for optimum future development in initial training and in their professional career (predictive value).[4]

AT attributes and assessment strategies

Based on the consensus achieved in Workshop-3, it was decided that ATs should focus on three cognitive or academic attributes (communication skills in both official languages of the Balearics, logic and mathematical skills, and oral communication) and several non-cognitive skills (interpersonal abilities, motivations, prior experience, etc.). In turn, the assessment strategies for these attributes were also agreed.

AT design

Once the attributes to be included and the assessment strategies to be followed were decided on, WT-2 comprising UIB lecturers and current schoolteachers was set up to undertake and specify the AT design, based on the scientific literature review on the topic and the consensus reached in Workshop-3. The result was a test prototype split into three phases: (a) cognitive selection through written tests; (b) mixed selection (cognitive and non-cognitive) through oral tests; and (c) eligibility verification.[5] The cut-off mark for all tests (after a logical analysis of the items included in them) was set at five on a scale of 0 to 10 (González and Jornet, 2009).

(4) The predictive value will be subject to more in-depth research in a longitudinal study.
(5) The pilot test prototypes can be viewed at: https://bit.ly/3pu9Qeb

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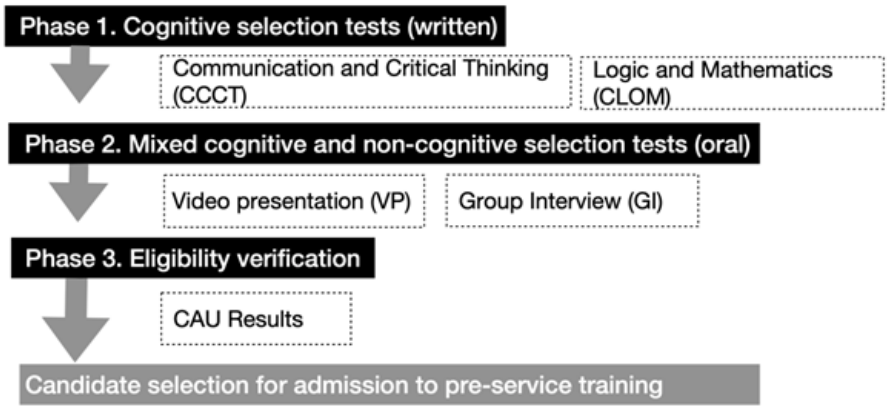
FIGURE II AT phases



Source: Compiled by authors

Cognitive selection phase (written)

The prototype for this phase was structured into two tests aimed at assessing Communicative Competence and Critical Thinking (CCCT) and Logic and Mathematical Competence (CLOM). Assessment for the CCCT was via a test comprising: (a) understanding and interpreting texts (a commentary on two texts: one in Spanish and one in Catalan with a similar content); (b) writing skills (two essay questions); and (c) language system mastery (three exercises on basic language knowledge). With regard to assessing the CLOM skills, a test with ten exercises and five scenarios from different content blocks was drafted: numbers and equations, geometry, algebra, probability, statistics and measurement.

Candidates would have to pass these two tests in order to move on to the oral selection phase.

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Mixed selection phase: cognitive/non-cognitive (oral)

In order to score attributes from the mixed selection stage[6], two complementary tests were chosen: a Video Presentation (VP) and a Group Interview (GI).

The VP comprised individual production of a so-called *written profile* but in video format.[7] Candidates were requested to make an 'introductory letter-style' video responding to a series of questions: Who am I? What am I like? What are my interests and hobbies? Why do I want to train to be a teacher?, etc.

With regard to the GI, applicant groups were formed who were given a news item on education and discussed, reasoned and argued their views until they reached a common position. Each interview was led and assessed by a university lecturer and a current schoolteacher.

To attain objective results from the interview, WT-2 designed a score sheet with six indicators for cognitive attributes (communication skills) and three non-cognitive attributes (interpersonal skills). In addition to the assessment indicators, it also highlighted their performance levels (with four attainment levels) and the weighting of each test in the final grade (30% for the VP and 70% for the GI). Interviewer training activities were also run, including role-play instruction.

(6) A mixed model was selected incorporating cognitive attributes that could only be assessed orally, in addition to the non-cognitive attributes (see Table II).

(7) A key element for selecting this type of test was the session held with a team at the Pompeu Fabra University who were running an admissions experiment for the Masters in Teacher Training by using a VP.

TABLE II. Cognitive and non-cognitive attributes of the ATs

Phase 1. Cognitive tests (written)	**Phase 2. Mixed tests (oral)**	
Cognitive attributes	**Cognitive attributes**	**Non-cognitive attributes**
- Understanding the meaning of written texts on useful topics, the ability to summarise and incorporate information, expressing thinking in a clear and concise manner, and mastery of the language system enabling communication at an appropriate language level in the two official languages of the Autonomous Region - The ability to apply scientific and technical thinking and knowledge about the social setting to interpret information received and to predict and take decisions independently and with initiative, as well as differentiate and assess scientific knowledge by contrasting it with other forms of knowledge - The ability to formulate, use and interpret mathematics in different contexts, solving problems that require basic calculation operations, basic geometric knowledge, estimates that require data processing, probability and chance	- The ability to discuss and argue, and knowing how to orally express ideas fluently and clearly, using correct language, varied vocabulary and a variety of grammatical structures	- Interpersonal skills - Psychological adaptation - Intrinsic motivation - Professional development orientation - Prior experiences, beliefs and motivations

Source: Compiled by authors

Eligibility verification stage

This phase verified whether the participating students had attained the University Admission Grade (CAU), thus ensuring they fulfilled the eligibility criteria. This would be the equivalent of the 'eligibility checks' stage proposed by Klassen and Kim (2017, p.19).[8]

AT validation

The plausibility of the tests (Ebel and Frisbie, 1991; Bachman, 1990 and López, 2009) was ensured in one external and three internal validation processes. Internal validation was performed by consulting: (a) experts not involved in producing the test; (b) secondary education teachers, counsellors and head; and (c) the candidates. External validation was performed by applying statistical methods to determine likeness

(8) This phase was not subject to experimentation as the pilot test was run during the school year.

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between the results obtained by students in the pilot test and those in the assessment tests performed at their home school centre during the school year.

Internal validation

Validation by experts

With regard to the expert validation (Callejo-Gallego and Viedma-Rojas, 2016; Díez-Gutierrez, 2020), a group of 13 specialists was established who had experience in the topics in the different tests (see Table III). These experts provided advice throughout the process whilst suggesting proposals to improve the prototypes and the assessment criteria, in line with indicators on clarity; importance; coverage; relevance; plausibility (to assess candidates for the degree courses); comprehension, and knowledge.

TABLE III. Composition of the external advisor group for expert validation

Tests	Group members
CCCT	- Two lecturers from the University of Girona (one of whom was a coordinator for the communicative competence admission tests in Catalonia)
CLOM	- Two schoolteachers from primary education centres who were experts in logic and mathematical training - Two lecturers from the University of Barcelona (one of whom was a coordinator for the logic and mathematical admission tests in Catalonia) - A lecturer from the University of Girona
VP and GI	- Five lecturers from the University of the Balearic Islands - One lecturer from the Pompeu Fabra University

Source: Compiled by authors

Validation by secondary education teachers

Ten teachers, counsellors and heads from different schools involved in the pilot test took part in this validation process. The assessors were asked to score (from 0 to 10) the need to run admission tests, returning an average score of 9.4.

The validation process comprised assessing the clarity, suitability, quantity and quality of the tests on a four-level Likert scale (see Table

IV), as well as the efficacy, number of questions and length of the test (see Table V).

TABLE IV. Score for the instructions and information to answer the questions in the cognitive tests

	Mean (4=excellent; 1=poor)	
	CCCT	**CLOM**
Clarity	3.6	3.7
Suitability	3.4	3.5
Quantity	3.3	3.2
Quality	3.4	3.6

Source: Compiled by authors

TABLE V. Score for the overall design of the cognitive tests

	Mean (4=excellent; 1=poor)	
	CCCT	**CLOM**
Efficacy in providing useful information to assess the suitability of future students	3.4	3.9
Number of questions	3.3	3.3
Test length	3.5	3.4

Source: Compiled by authors

They also assessed the instructions, information and design of the tests quantitively (with average scores between 3.2 and 3.9). In all but two instances, the top score was four and the lowest three, meaning agreement was high amongst the assessors.

The assessors made several suggestions to improve the test content. The most significant are highlighted below:

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Suggested improvement for both tests:

– Include skill scoreboards for SEN / SLD / ADHD students for dyslexia or dyscalculia in order to assess how this may affect their teaching future.

Suggested improvements for CCCT:

– Include a question where they have to write a text with a register more suited to the pupils they will teach
– Include some critical thinking activities that assess the psychological profile of the students
– More clearly separate between Spanish and Catalan to avoid confusion
– Change the font size and line spacing. Perhaps also clearly separate questions in Catalan and in Spanish.

Suggested improvements for CLOM:

– Make them argue in different resolution strategies or in an activity
– Add more logic tests and remove a mathematical exercise
– Take into account the methods: knowing how a result is attained.

This process enabled content validity for the tests to be established through expert agreement (Pedrosa, Suárez-Álvarez and García-Cueto, 2013).

Validation by students

Students participating in the pilot test (n=107) were asked to fill in an anonymous questionnaire about the difficulty and duration of the tests, the clarity of the information and the number of questions. The aspects that scored highest amongst students were (on a 10-point Likert scale): clarity of information and instructions in the GI (9.5); the CCCT (9.1); the number of questions in the GI (9.5), and the length of the test (9.1 for the CCCT and 9.3 for the CLOM and GI). The aspect that scored lowest was the level of difficulty: CLOM (7.7) and CCCT (7.8) (see Table VI). Most students gave scores between seven and ten, representing a fairly high level of consensus.

TABLE VI. Scores for the tests given by students

Test features	Average (10 = very suitable; 1 = not at all suitable)		
	CCCT (n=107)	CLOM (n=107)	GI (n=16)
Level of difficulty	7.8	7.7	8.9
Clarity of information and instructions to help answer the questions	9.1	8.8	9.5
Number of questions	8.6	8.8	9.5
Length	9.1	9.3	9.3

Source: Compiled by authors

Pilot test

The pilot trial was performed with the sample of 107 students who took part in the validation (from the second year of baccalaureate and upper level VET) from 14 centres (nine public schools and five charter schools). In light of the impossibility to run a random sample *in the strictest sense*, it was decided to do an *ad-hoc* sample with representation from different types of centres. The students at these centres who showed interest in registering on one of the two GIP degree programmes were invited to sign up for the pilot test and, if they passed the first phase, to take part in the mixed selection phase.

Descriptive statistics of central tendency (mean, mode and median), absolute dispersion (standard deviation) and relative dispersion (coefficient of variation) were used to analyse the results from each test. The Pearson correlation coefficient was used with a view to determining the possible link between different analysed variables. The SPSS v.24 statistical analysis program was used to process and analyse the data.

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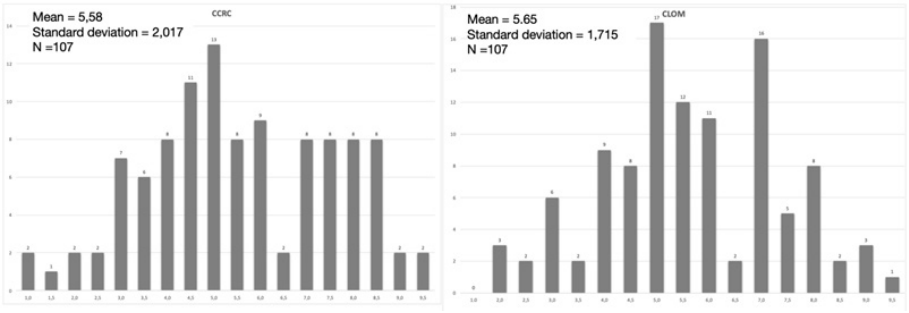
FIGURE III Histogram for result frequency in the cognitive tests



Source: Compiled by authors

The bivariate analysis shows a low correlation between the CCCT and CLOM tests, with a Pearson correlation coefficient of 0.313 (p=0.001). This makes sense since the tests measure different attributes.

Nearly half of the candidates (49.6%) failed to pass one of the tests in the first phase in line with the set criteria; 50.4% moved on to the next phase. The *screening* effect of this phase is clear (Klassen and Kim, 2017), ensuring that candidates who pass it have a high level of cognitive attributes.

With regard to the mixed tests, it should be noted that from the 55 students who agreed to take part, 25 passed Phase 1. A representative group of 16 was selected from this set (sex, selected course—early childhood or primary—, home centre and marks from phase one) who had given their consent to take part in this phase. Students were split into two equal groups for the VP and GI.

TABLE VII. Descriptive statistics results for students who did the mixed tests

Descriptive statistics	VP Score	GI Score
Mean	7.61	7.05
Median	7.22	6.94
Mode	8.88	10
Standard deviation	1.55	2.09
Coefficient of variation	0.20	0.30
n	16	16

Source: Compiled by authors

All candidates passed the VP, whilst four students failed the GI. After applying percentages (30% VP and 70% GI), only one candidate failed the test globally by not attaining the necessary mean, with low scores in most cognitive skill indicators but, especially, communicative and interpersonal skills which were not detectable in the cognitive phase.

External validation

In order to determine the relationship between the students' results and other assessment tests performed at their home centre, a similarity indicator was used for the cognitive tests based on an analysis of the information provided about the participating students from their tutors. This information showed to what extent the test results matched the usual results for said students during the year at their home education centre. It was noted that coincidence was high for both the CCCT (79.4%) and CLOM tests (75.7%) (see Table VIII). After calculating the central tendency and variability measures, it was observed that the differences in means were very low, meaning the indices of dispersion were very small. In this sense, it was concluded that the score given by the judges was convergent.

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TABLE VIII. Coincidence level for the cognitive test results with the usual results for students at their home centre

Coincidence level	CCCT		CLOM	
	Frequency	Percentage	Frequency	Percentage
No coincidence	5	4.7%	3	2.8%
Low coincidence	17	15.9%	22	20.6%
Fairly similar	53	49.5%	50	46.7%
Total coincidence	32	29.9%	31	29%
Missing	0	0%	1*	0.9%
Total	107	100%	107	100%

* One student was not taking mathematics during this school year.
Source: Compiled by authors

Based on all the information collected in the validation, WG-2 reformulated and improved[9] the AT proposal, which was approved by the UIB Governing Council in July 2019 and received a positive report on modifying course syllabi from the National Agency for Quality Assessment and Accreditation (ANECA) in April 2020[10].

Phase 3 Post-design (2019-2021)

Within the framework of planning and designing supplementary measures based on critical contributions, Workshop-4 was run with 39 specialists (university lecturers and current schoolteachers) with a view to designing measures to attract the best prepared and most motivated students.

The main measures adopted by consensus included:

- Offering pre-candidates the chance to visit innovative educational centres

[9] The changes made can be viewed at the following link: https://bit.ly/3orRSr9
[10] Information on the test and the exam templates are available at: https://estudis.uib.es/es/grau/acces/admissio_pap_edu/

- Running a promotion and awareness campaign aimed at families and students to reappraise the teaching profession (press, education debates, etc.)
- Organising guidance sessions in primary and secondary education on the teaching profession, where students from the later years of the degree would take part
- Enhancing ongoing training for secondary education teachers with a skill focus
- Initiating the transformation process for the university entrance examinations in the Balearics (PBAU) so that they included a more skill-based approach
- Undertaking longitudinal monitoring of students who joined the degree programmes through the admission test in order to analyse their progress throughout their training and career.

Discussion on the results, conclusions and outlook

Beyond developing admission tests to be used for teacher training at a specific university, the results from the case study in this article propose a template (see Figure IV) to broach the topic from a participatory perspective—a methodology not used to date for this type of work based on current literature on the topic.

In terms of the tests produced, it should be stated that the case study confirms there is no single focus to approach the candidate selection process for pre-service teacher training (ASPA, 2015). Based on the evidence, establishing a universal template to identify and assess the necessary student qualities for this training is an extremely complicated task (Darmody and Smyth, 2016). It should be approached by considering the specificities of each cultural and educational context. In any event, a series of general guidelines has emerged from the results obtained. The most prominent is perhaps the finding that based on an analysis of eligibility, the *Grade Point Average* (GPA) as sole criterion is an unsuitable selection system. The data underscore that suitable selection processes should be based on both cognitive and non-cognitive candidate abilities. In this regard, it should be highlighted that the consensus-based options for attributes to be considered in the design process (phase 2) are in line with current evidence (Casey and Childs, 2007; Klassen and Kim, 2017;

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Klassen, Durksen, Kim, Patterson, Rowett, Jane, Warwick and Wolpert, 2017; Klassen, Durksen, Hashmi, Kim, Longden, Metsäpelto, Poikkeus and Györi, 2018). In turn, the low correlation between the CCCT and CLOM test results underscores this appropriateness.[11]

Including the *written profile* in the tests (VP) is in line with current proposals, given that it is the second most common strategy in ATs (Casey and Childs, 2011). With regard to the group interview (GI), it should be stated that it is a widely used strategy in other countries as part of the ATs for admission onto teacher training courses (Casey and Childs, 2007; Klassen, Dolan and Afzal 2015). Although it is a complex process, it has shown itself as having a better predictive capacity than cognitive criteria alone (Shechtman, 1992); it may also be deemed a fair selection system for applicants (Bye and Sandal, 2016), as well as being particularly useful for detecting students with unsuitable profiles (suitability score) for education courses (Leshem, 2012) and for ranking students (setting value).[12] Nonetheless, experiments have demonstrated the difficulty of this type of test and the importance of using scorecards and assessor training, since candidates may skew their responses to increase their chances of success (Johnson and Saboe, 2011).

Attracting the best candidates to the teaching profession is a major challenge and, therefore, an important topic for educational research (see, Morris, Gorard, Kokotsaki and Abdi, 2020). The results from Workshop-4 on 'defining supplementary measures for admission tests' are in the same vein as the results from work by Klassen, Gragner and Bardach (2020). They are also consistent with education policies from the UK *Department for Education* that proposes candidates undertake testing days at teaching centres within the framework of the *Discover Teaching* programme (Department for Education, 2019). These steps, as well as those agreed in Workshop-4, enable candidates to perform *realistic job previews* (RJP) based on *person-environment* and *person-vocation* theories (Klassen et al., 2020).

The research team is aware that the designed prototype and its validation are an initial contribution that will need to be supplemented by using more robust instruments and statistical tests. This process

(11) In Spain, it would be the CAU grade.

(12) In our case, 31.25% of students obtained scores equal to or above 8; 25% obtained scores above 6 and below 8; and 47.75% obtained scores equal to or below 6.

is planned to take place with the currently ongoing design for the longitudinal assessment.

In terms of the template, it should be highlighted that just as using participatory and group approaches in university teaching has significance for wider and better learning and student motivation (Calvo-Sastre, 2020; Martínez-Dominguez, Arandia-Loroño, Alonso-Olea and Castilla Prieto, 2011), their adoption in improvement processes for training or management programmes is fundamentally supported by involving stakeholders as key elements in organisational success (Wilcox, 1994; Involvement and Participation Association, 2014; Karasti, 2014; Abu-Amsha et al., 2019). In this context, selecting a participatory approach to producing ATs involves consulting, mediating, negotiating and seeking consensus in decision-making (Booker and Goldman, 2016; Engelbertink et al., 2020)—activities that were closely followed in the different phases of the process presented here. Nevertheless, one should ask whether these activities could have been investigated even further. Since a global evaluation of the process has not yet been performed (a limitation that the authors are aware of), a clear answer cannot be provided. Thus, issues such as to what extent the process widened involvement and commitment from lecturers on the GIP degree courses or how using ATs could have contributed to improving the training programme remain to be answered through evidence that will be looked at in future works.

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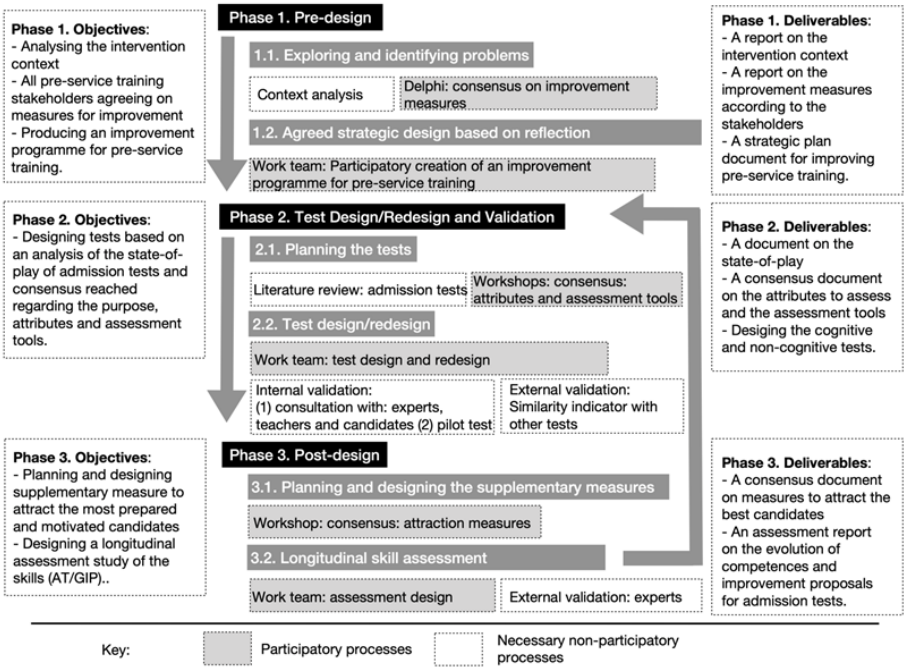
FIGURE IV. Admission test design based on a participatory process[13]



Source: Compiled by authors

Finally, it should be noted that when writing this article, the longitudinal skill assessment study is currently being designed, based on contributions from current experiences (Bieri and Schuler, 2018) and expert validation. This study has enabled data to be obtained that aids in drawing inferences to improve the selection process.

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This article is one of the outcomes of the project: 'Producing Student Selection Tests for Admissions onto Pre-service Early Childhood and

(13) The participatory process aims to continue over time and, therefore, when the tests are in place, phase 2 shall be repeated so that the ATs are redesigned as many times as necessary, based on the results from the analysis of the longitudinal assessment in phase 3.

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Initial training and access to the profession: teachers' demands[1]

Formación inicial y acceso a la profesión: qué demandan los docentes

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Abstract

Initial teacher education programs are under great pressure because they are expected to train teachers who are highly prepared for the complexity that their professional practice requires. However, we know that the teaching profession is extremely complex, and its professional development must be progressive. In this sense, initial training is an essential element. For this reason, this paper analyzes the perceptions about initial teacher education and access to the profession of active teachers of compulsory education in schools in Spain. The research followed an ex post facto design. An ad hoc questionnaire has been designed with a robust validation in four phases, applied to 1148 teachers. The analyses include both descriptive (percentage and median) and nonparametric inferential statistics (U-Mann Whitney and H de Kruskal Wallis tests). Results show a negative evaluation of the current systems for both initial training and access to the profession. However, significant differences are also found. In initial teacher education these exist, on one hand, between teachers who work in Primary Education and those who work in Secondary Education and, on the other hand, in questions related to access to the profession, significant

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differences are observed depending on the type of center in which they teach. There is general agreement among teachers on the relevance of modifying both initial training and access to the profession. It has also been confirmed that the teaching profession is a heterogeneous group and, therefore, the measures cannot be the same for all.

Key words: preservice teacher education, access to the profession, teacher professional development, teacher training, basic education, preservice teacher curriculum, teacher education programs.

Resumen

Los programas de formación inicial del profesorado están sometidos a una gran presión dado que se les estima la función y la exigencia de formar a docentes altamente preparados para la complejidad que su ejercicio profesional requiere. Sin embargo, sabemos que la profesión docente tiene una enorme complejidad y su desarrollo profesional debe darse de forma progresiva. En este sentido, la formación inicial constituye un elemento esencial. Por ello, en este artículo se analizan las percepciones sobre la formación inicial y el acceso a la profesión de los docentes en activo de la Educación Obligatoria en España. La investigación ha seguido un diseño ex post facto. Se ha diseñado un cuestionario *ad hoc* que cuenta con una validación robusta en cuatro fases, con una muestra 1148 docentes. Los análisis incluyen tanto estadística descriptiva (porcentajes y mediana) como inferencial no paramétrica (mediante las pruebas U-Mann Whitney y H de Kruskal Wallis). Los resultados manifiestan una valoración negativa de los actuales sistemas tanto de formación inicial como de acceso a la profesión. Sin embargo, también se encuentran diferencias significativas relevantes en la formación inicial; estas existen, por un lado, entre de los docentes que ejercen en Educación Primaria y los que lo hacen en Educación Secundaria y, por otra parte, en las cuestiones relativas al acceso a la profesión se observan diferencias significativas en función de la titularidad del centro en la que ejercen la docencia. Se confirma un acuerdo generalizado entre los docentes en la pertinencia de modificar tanto la formación inicial como el acceso a la profesión. También se ha confirmado que la profesión docente es un colectivo heterogéneo y, por tanto, las medidas no pueden ser las mismas para todos.

Palabras clave: formación inicial docente, acceso a la profesión, desarrollo profesional docente, formación del profesorado, educación básica, planes de estudios, programas de formación docentes.

Introducción

Hattie (2003) reaffirmed that teachers are the most powerful element in the education system when it comes to student achievement. This was subsequently internationalized by the OECD (2005) and the Mckinsey report (Barber and Mourshed, 2007). This recognition has brought about a two-edged movement: on one hand, that of promoting a great number of policies geared toward how to define the profession, and on the other, making ever greater demands on the teaching collective along with an unprecedented pressure on them professionally (Edling and Simmie, 2020; Lubienski and Brewer, 2019). We must not forget that while teachers are important, so are the ways schools are organized and managed (Bolívar and Pérez-García, 2019), the resources made available to them (Imbernón, 2019;) Tidball and Krasny, 2011) and the social consideration given to the profession (Fernández Enguita, 2019; Hargreaves, Elhawary, and Mahgoub, 2008) and many other aspects. In this context, teacher training constitutes and essential element. From an international perspective (Eurydice, 2018; OECD, 2019a) there are two main interventions on the matter of teachers: one is the recognition of permanent/ongoing/continuous/life-long training in the paradigm of Lifelong Learning and the other is the accent on initial training and the early years of their career. This latter aspect is the one discussed in this article. It is also in line with the United Nations Sustainable Development Goals for 2030, and specifically with Goal 4 as defined in the Incheon Declaration (UNESCO, 2015).

As Caena (2014) states, initial teacher training is the first step in a teacher's career. It lays the foundations for a professional mentality that gives the teacher a set of basic tools to make classroom teaching meaningful. Darling-Hammod (2010) reminds us that this is the stage that shows new teachers the future day-to-day practice, offers them the chance to experiment in the reality of schools from within a "safe" environment, and fosters a culture of contrasting, discussion, reflection, and sharing of ideas and experiences. Initial training not only provides knowledge and experiences, but also allows for the construction of pedagogical criteria (Hargreaves and Fullan, 2015) suited to the specific needs and situations of each context. Initial teacher training is an intensive experience and is intellectually demanding, since it requires analyzing, questioning, and

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revising ideas within the context of theory and practice (Esteban, 2016; López-Rupérez, 2014).

Nowadays, initial teacher training programs are under increasing pressure from being expected to produce teachers completely capable of addressing the needs of schools today as well as able to positively influence student achievement (Appel, 2020; Duffin, French and Patrick, 2012). Teacher training should be progressive (Darling-Hammond and Hyler, 2020; Imbernón, 2019). It should take into account the fact that those who join initial training programs do so bringing in a vast amount of prior knowledge regarding classrooms, schools, teachers, and instructional practices based on their own school experiences (Clark and Newberry, 2019; Landon-Hays, Peterson-Ahmad and Frazier, 2020).

Future teachers and currently practicing teachers alike insist on the need to better connect initial training with the reality of teaching, and thus, on increasing and improving the practical dimension of this period (Romera and Ruiz, 2017; Valle and Manso, 2011). The academic nature of initial training as well as of entry into the profession is one of the causes why teachers negatively assess this initiation period (Domínguez-Fernández and Prieto, 2019; Manso and Martín, 2014). However, there is no better moment that the university period to delve deeper in the conceptual bases (Alonso-Sainz and Thoilliez, 2019) that will later provide solid underpinnings for educational actions and practices.

This debate on the purpose of professional initiation is directly related to the contents that must included in this period as well as their organization and their quantity. Eurydice (2018) identifies three broad contents: disciplinary, didactic, and psychopedagogical. The three models of initial training that arise from their organization and integration are *consecutive* (doing disciplinary training first, then didactic and psychopedagogical afterwards), *concurrent* (doing the disciplinary, didactic, and psychopedagogical training simultaneously), and *mixed* (choosing ways to become a teacher with concurrent and consecutive modalities alike).

Regardless of the model, the different initial training programs always include a practical dimension at schools. As Zabala (2011) points out, the practicums constitute the first real insertion into a school, making their potential undeniable. There are a multitude of approaches on how to organize and understand the practical dimension of initial training. Salazar and McCluskey's qualitative research (2017) confirms the

relevance that practicum experience at schools during initial training has on subsequent professional learning and on developing teacher identity. This becomes even more important considering the relationship between the future teachers' view of their professional identity and the development of educational competencies linked to socioeducational and methodological aspects (Pérez, Serrano, and Pontes, 2019). Furthermore, the practicums at schools constitute a vital space in the formative process that new teachers begin. Thus, in a recent study, Orland-Barak and Wang (2021) identify at least four approaches to school practicums depending on where the main emphasis is placed: (i) personal growth, (ii) situated learning, (iii) the basic practice, or (iv) the transformational critique of the practice. In Spain, a study by Gortazar and Zubillaga (2019) showed that 81% of the teachers surveyed said they disagreed with the statement "the relationship between university and schools is suitable to promoting a model of the teaching profession".

Given the complexity of integrating all the elements in initial training, countries such as Germany, Australia, Japan, and Chile have for decades been implementing new teacher induction programs (OECD, 2019b). And over the last decade, more than ten other European countries have done the same (Eurydice, 2018). This measure is directly related to entry into a profession whose relevance has relevant consequences and on which empirical evidence has existed for several decades (Barber and Mourshed, 2007; Hattie, 2003; Melgarejo, 2006). The Gortazar and Zubillaga (2019) report shows that 72% of the teachers "consider it necessary for there to be a paid transition phase to the teaching profession based on an insertion period at schools."

In Spain, the latest TALIS report (OECD, 2019a) also highlights the importance of initial training as the basis for teacher training and development. It also insists on the need to increase and improve training in regard to "training in general pedagogy", and quite specifically in the case of Secondary Education teachers; although 96% of the Primary Education teachers responded that they had received psycho-pedagogical training, the percentage drops to 85% in the case of Secondary Education teacher (putting the OECD average at 94% for this stage in education). However, it should also be noted that in Spain while there are great differences initial training between future teachers of Primary Education and Secondary Education, the main differences for entry into the profession and subsequent career development are between teachers

working in state schools and those at private or chartered schools. This was already made apparent in the teacher survey study by Martín (2010) and was refuted in Gortazar and Zubillaga (2019). Lastly, entry into the profession is heavily influenced by the type of contract and the status acquired by the teacher on one hand, and the autonomy of the schools in hiring new teachers on the other (Caena, 2014; Valle and Manso, 2018).

Method

This research has followed an ex post fact design for the main purpose of analyzing perceptions on initial teacher training and the teacher selection process for Basic Education at schools in Spain. This purpose has been further broken down into the following two specific objectives: (i) to characterize teacher perception on initial training and selection for entry into the profession; and (ii) to analyze the existing differences in said perceptions as a function of the ownership of the school, the educational stage, and the teacher's years of experience. From the second specific objective, the following three contrast hypotheses are derived: there are differences in teacher perceptions on initial training and selection for entry into the profession with respect to (i) ownership of the school (state-owned vs private/chartered); (ii) the educational stage (primary vs secondary); and (iii) the teacher's experience (years of work).

Sample

The study population are teacher currently working in Basic Education (primary and compulsory secondary education) at schools in Spain. The sample consists of 1148 subjects who voluntarily answered a questionnaire on perceptions. This sample is significant and complies with minimum sample sizes of the general population as well as by strata of ownership, educational stage, and Autonomous Community (Andalusia, Catalonia, Comunidad de Madrid, Comunidad Valenciana and the Basque Country) with a reliability of 99% and error of 1%. The sample consisted of 70% men and 30% women, although no significant differences were found between them, or between Autonomous Communities.

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We considered two independent variables to check for differences in age: age itself and years of experience. Both are initially quantative variables. Our findings showed that both variables behaved similarly, with a significant Pearson correlation of 0.01 (r=.839). Consequently, the study only shows the years of experience, which have been grouped into a 6-level scale cut off by homogenous percentiles. Note that the same sample does not exist, because of the different sample size for any particular year of experience. Therefore, the sample from each of these 6 levels corresponds to a percentage of the total (see Table I) that ranges from 14.4% to 19.6%.

TABLE I. Description of the sample

		How many years have you been working as a teacher?						
		0-5	**6-12**	**13-16**	**17-21**	**22-29**	**30-42**	**Total % (N)**
Primary Education	**Public**	1.7%	5.9%	5.7%	4.8%	5.1%	5.8%	**29.1% (334)**
	Private/ Charter	2.4%	2.3%	1.4%	2.3%	2.2%	1.2%	**11.8% (135)**
Secondary Education	**Public**	10.1%	8.7%	6.1%	7.3%	7.7%	7.2%	**47.1% (541)**
	Private/ Charter	3.0%	2.7%	1.2%	1.6%	2.1%	1.5%	**12.0% (138)**
	Total % (N)	**17.2% (198)**	**19.6% (225)**	14.4% (165)	15.9% (183)	17.1% (196)	15.8% (181)	100% (1148)

Source: original work.

Regarding school ownership, because of the sample and of seeing that the behavior of private and charter school teachers was similar, it was decided to turn this variable into a dichotomy, leaving two groups: public and private/charter. With this first decision made, there are two variables regarding this first classification matter: where the teacher first started working and the ownership of the current school. In this regard it was important to find out the variability and movement from one ownership to another. It was seen that only a dozen subjects went from charter or private schools to public schools, and the rest of the changes were the

opposite way. Because of the low variability among systems, when we refer to school ownership we refer to the teachers who work at public schools or at charter/private schools, depending on the item "ownership of the school where you worked most recently." Thus, 23.8% of the teachers sample are from the charter and private system (21.6% and 2.2% respectively) and 76.2% are from the public system. With respect to the educational stage they teach at, 59.1% are teachers of secondary education and 40.9% are primary education teachers.

Instrument

The instrument used is a questionnaire devised and validated in four phases (Garrido, Álvarez, and Alonso, 2015). The selection of items and design of dimensions were created ad hoc for the research. A 6-point Likert scale was chosen for the perception answers to avoid the average tendency by exclusively nominating the extreme values. Moreover, this scale allowed us to group the perceptions into slight agreement (1-2), medium agreement (3-4), and high agreement (5-6). The content was validated using an inter-rater reliability process of 12 experts in methodology and teacher training who assessed the pertinence of the categories and their items. 11 items with a value below the minimum content validity ratio of (CVR<.56) established by Lawshe (1975) were eliminated, split, or merged to ensure the unlikelihood of random agreement. We also obtained a high content validity ratio (CVR=.91). In order to analyze internal consistency, a pilot test was carried out with 63 teachers participating (with homogeneity in the number of teachers between the independent variables) that made it possible to identify several errors that were recorded to modify the final version. That final version was used to perform a statistical validation. To determine the reliability of the instruments, i.e., their internal consistency, after eliminating 6 items, Cronbach's alpha coefficient was used, the result being α= .856. Construct validity was determined by carrying out sampling adjustment measures to verify the possibility of performing factor analysis Therefore, Barlett's test of sphericity was carried out, rejecting the null hypothesis of no correlation among variable, and the Kaiser-Meyer Olkin measure of sample adequacy, with a result of >.80; making the matrix suitable for factorization. All the items were also checked for a communality of

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>.50. With these values taken into account, a main component analysis was used since our objective was the one-dimensionality of the items proposed, previously defined with the Item Response Theory, for each dimension in a single factor whose explained variance was greater than 60%. The instrument consisted of a total of 66 items.

Procedure

The instrument, administered online, was sent by e-mail on two occasions to a previously created database of more than 15,000 schools in Spain with Primary and/or Compulsory Secondary Education, respecting the guidelines set by the ethics committee[2].

For our study we only used 33 items distributed in four blocks: (i) assessment of their own initial training; (ii) assessment of potential measures to improve the initial training period; (iii) assessment of their entry into the profession; and (iv) assessment of what entry into the profession should be like.

The independent variables taken into account in this work are the ownership of the school (public - private/chartered), educational stage (Primary Education - Secondary Education), and teaching experience (its ordinal transformation). Other factors analyzed for which no significant differences were found were whether the student had had another previous professional career, the selection processes by which he/she had entered the teaching profession, the type of initial training, and the main reason for becoming a teacher.

A non-parametric inferential analysis was performed since we worked with ordinal variables whose distribution does not meet the assumption of normality (Thoilliez, López-Martín, Expósito-Casas, and Navarro-Asencio, 2013). Thus,we used a Mann-Whitney U analysis to interpret significant differences between dichotomous variables and the Kruskal Wallis H test for categorical variables with more than two variables. With respect to the descriptive analysis, it was considered more pertinent to use the median and variance, and not having to take the ordinal variables as continuous in order to use averages. For dichotomous variables (stage

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and ownership, carried out with the Mann-Whitney U test) effect size was calculated using Rosenthal statistics ($r=Z/\sqrt{n}$), and for the years of experience (carried out with the Kruskal-Wallis H test), the epsilon square value ($E_R^2 = \frac{H}{(n^2-1)(n+1)}$), since the "n" is sufficiently large.

For "r", following Cohen's guidelines, we considered a small effect size for values less than .30, intermediate effect from .30 to .50, and strong effect greater than .50. All epsilon squared values were .00 and r<.30, except for two items that will be discussed in the results section.

Results

The results are presented per the four blocks stated in the section above and which are themselves grouped into two sections: initial training and entry into the profession.

Initial teacher training

With respect to the first block, Table II shows that teachers gave a low score to the contribution initial training had on their later professional activity: on the 11 items the medians range between values of 2 or 3. Of all of them, the scores that teachers give in relation to "tutoring and guidance", "attention to comprehensive development", "promotion, organization and participation in the school" and "educational innovation" are noticeably very low. In the case of "collaboration with families" and "attention to the ANEE" the score is even lower since nearly 70% of the teachers scored them between 1 and 2. At the other extreme, the most positive scores are the ones on "curricular content" and the "construction of a climate of respect, participation, and freedom": they are the only items where the median is 3.

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TABLE II. Assessment of aspects of their initial training.

Item		Percentages						Me	Var
		1	2	3	4	5	6		
Your initial training prepared you in...	curricular content	13.68	16.55	21.17	16.46	17.86	14.29	3	2.62
	lesson planning	25.44	24.65	21.60	15.33	9.67	3.31	2	2.01
	evaluation	24.48	29.01	22.56	14.11	6.97	2.87	2	1.78
	student tutoring and guidance	36.76	30.14	17.86	8.62	4.62	2.00	2	1.59
	attention to special needs students	44.60	27.09	13.59	7.23	5.05	2.44	2	1.71
	attention to the comprehensive development of students	35.98	26.66	18.64	11.41	5.31	2.00	2	1.71
	promotion, organization, and participation in the school	36.06	27.00	19.69	10.10	4.97	2.18	2	1.68
	building a climate of respect, participation, and freedom	27.96	22.04	19.08	13.59	11.59	5.75	3	2.40
	collaboration with families	41.46	26.31	16.11	9.49	4.09	2.53	2	1.70
	educational innovation	35.98	22.04	16.90	11.59	8.36	5.14	2	2.32

Source: original work.

Considering the significant differences (see Table III), we see that the independent variable "stage" is the one in which there are significant differences in all the items between the evaluation made by Primary and Secondary Education teachers. This does not occur with the other two independent variables ("years of experience" and "ownership"). Once again, the item on "curricular content" proves noteworthy in that it is the only one of the 11 items in which there is a significant difference between "stage", but not between "years of experience" and "ownership". Th primary school teachers' responses are mainly at the medium level, with only 23% of them considering that they were prepared in curricular content at a high level (5-6). However, among Secondary Education teachers, the results are polarized, with 38.4% of the responses at a high level (5-6) of preparation and 31.2% at a low level (1-2).

TABLE III. Significant differences in the evaluation of aspects on their initial training.

Item		Stage		Years Experience			Ownership	
		Mann-Whitney U	p	Kruskal-Wallis H	gl.	p	Mann-Whitney U	p
Your initial training prepared you in...	curricular content	144614.0	.007*	7.592	5	.180	153854.0	.585
	lesson planning	120807.0	.000*	8.013	5	.156	136054.5	.000*
	evaluation	143233.5	.003*	12.971	5	.024*	149206.0	.154
	student tutoring and guidance	136443.0	.000*	6.542	5	.257	140875.5	.002*
	attention to special needs students	114869.0	.000*	18.153	5	.003*	140724.5	.002*
	attention to the comprehensive development of students	117554.0	.000*	7.279	5	.201	137594.5	.000*
	promotion, organization, and participation in the school	122023.0	.000*	4.777	5	.444	143274.5	.010*
	building a climate of respect, participation, and freedom	133981.0	.000*	11.008	5	.051	143550.0	.013*
	collaboration with families	132725.5	.000*	19.217	5	.002*	146719.0	.053
	educational innovation	148484.5	.044*	75.274	5	.000*	141979.5	.005*

* $p < .05$

Source: original work.

In relation to the second block of questions regarding teachers' scores assessing potential measures to improve the initial training period (see Tables IV and V), teachers consider that aspects referring both to entry into initial training and to its content should be modified for both Primary and Secondary Education.

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TABLE IV. Assessment of measures on initial training.

Item	Percentages						Me	Var
	1	2	3	4	5	6		
Access to degrees in Education should be much more demanding than it is at present	5.05	6.10	15.24	13.50	19.77	40.33	5	2.33
Primary school teachers should master the curricular content of all the subjects they teach	1.66	4.70	13.85	16.81	23.78	39.20	5	1.73
The most important thing for a primary school teacher is their didactic-pedagogical training	1.57	5.49	14.98	24.30	28.48	25.17	5	1.57
The most important thing for a secondary school teacher is his/her mastery of his/her subject matter	5.14	10.63	22.04	31.79	20.82	9.58	4	1.66
Secondary school teachers need more didactic-pedagogical tools	1.57	1.83	7.32	10.98	26.31	52.00	6	1.32
In initial teacher training for secondary school teachers, both pedagogical content and curricular content should be taught at the same time	2.53	2.79	9.23	14.29	27.96	43.21	5	1.59
Teachers need initial training with more weight on theoretical matters	9.84	17.68	23.61	26.83	12.72	9.32	3	2.00
The practicums are much more useful than theoretical training	0.70	2.09	10.45	17.16	24.65	44.95	5	1.34

Source: original work.

The statement the teachers agreed most with is that "Secondary school teachers need more didactic-pedagogical tools" (almost 80% of them score their agreement as 5 and 6 out of 6 and the median is 6). This fact is reinforced by not finding significant differences in the responses according to the stage (p=.738), years of experience (p=.520), or school ownership (p=.050). This datum on Secondary Education teachers should be seen together with data on the other item related to secondary teachers: When asked if "the most important thing for a secondary school teacher is his/her mastery of his/her subject matter", the values tend to be intermediate, which means that, although there is an explicit recognition of disciplinary knowledge, it is not what they consider to be the most important. In this case, we did find significant differences (p=.001) regarding the educational stage in which they teach. Low-scoring responses behave very differently: only 11.9% of Secondary Education teachers do not agree with the statement that the most important thing is the content whereas 21.3% of Primary Education students responded that way as well. The other item teachers disagreed

most with (and the only one in which more disagree than agree) is that "teachers need initial training with more emphasis on theoretical subjects", which reinforces the idea mentioned above. To conclude with regard to Secondary Education teachers, when asked whether "in the initial teacher training of Secondary Education teachers, pedagogical content and curricular content should be studied at the same time", most teachers (more than 70% with high values of 5-6) agree with this statement. However, significant differences were found depending on the educational stage (p=.002); 12.1% of Secondary Education teachers do not agree with this system (low level 1-2) while in Primary Education this same figure drops to 1.7%. There are also differences by years of experience (p=.038), with the group of novice teachers (0-5 years) showing less agreement with the model.

Regarding the three items on future Primary Education teachers, there is a high degree of agreement on all of them (with a median of 5). Teachers agree that "Primary teachers should master the curricular contents of all the subjects they teach" and that "the most important thing for a Primary teacher is his or her didactic-pedagogical training". In this second item, there are significant differences depending on the stage in which they work (p=.003). Primary Education teachers outscore Secondary Education teachers by more than 10 percentage points in their high degree of agreement (5-6) and in their years of experience (p=.015), where more experienced teachers give less value to this training. Furthermore, around 75% of teachers agree that "entrance requirements into teaching degree programs should be much more demanding than at present"; in this case, there was no significant difference in terms of the educational stage (p=.108).

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TABLE V. Significant differences in the scoring of measures on initial training

Item	Stage		Years Experience			Ownership	
	Mann-Whitney U	p	Kruskal-Wallis H	gl.	p	Mann-Whitney U	p
Access to degrees in Education should be much more demanding than it is at present	150704.0	.108	5.731	5	.333	139139.0	.001*
Primary school teachers should master the curricular content of all the subjects they teach	154795.5	.403	4.642	5	.461	154114.5	.609
The most important thing for a primary school teacher is their didactic-pedagogical training	143484.0	.003*	14.150	5	.015*	151691.0	.337
The most important thing for a secondary school teacher is his/her mastery of his/her subject matter	141443.0	.001*	1.331	5	.932	156584.5	.968
Secondary school teachers need more didactic-pedagogical tools	157536.5	.738	4.208	5	.520	146908.5	.050
In initial teacher training for secondary school teachers, both pedagogical content and curricular content should be taught at the same time	143217.0	.002*	11.790	5	.038*	143581.0	.011*
Teachers need initial training with more weight on theoretical matters	146017.0	.015*	11.837	5	.037*	140861.0	.003*
The practicums are much more useful than theoretical training	147633.5	.026*	21.914	5	.001*	142561.5	.006*

* $p < .05$
Source: original work.

The last item consulted relates to practices, and is the one on which teachers show the greatest agreement. Almost 90% of them consider that "practicums are much more useful than theoretical training". Furthermore, there are no significant differences ($p \geq .05$) between teachers in terms of any of the three independent variables.

Selection to enter the profession

In relation to the third block (see Table VI), teachers consider that the main aspect that was taken into account in their selection processes was "curricular knowledge" (median of 5). The second highest score (median

of 4) went to "personal aptitudes to be a teacher". And from there, most teachers (with more than 50% of them giving it a score of 1, 2, or 3) consider that the rest of the items were not particularly relevant.

TABLE VI. Assessment of aspects included in the access to the profssion

Item		Percentages						Me	Var
		1	2	3	4	5	6		
I believe that in my selection/ hiring process they valued…	the adequacy of my curricular knowledge of the subjects I would teach	8.19	8.36	14.20	17.33	25.35	26.57	5	2.48
	my skills at putting together didactic programs	17.94	15.51	18.38	17.42	20.56	10.19	3	2.64
	my knowledge of different types of educational methodologies and innovations	20.56	17.25	20.12	17.86	16.99	7.23	3	2.48
	my skills with regard to tutoring and/or guiding students	30.31	20.56	18.38	13.33	9.76	7.67	2	2.57
	my skills with regard to giving guidance and support to families	36.50	22.91	15.59	10.80	9.15	5.05	2	2.35
	my possibilities of attending to the comprehensive development of the students	24.91	18.12	16.64	13.50	14.72	12.11	3	2.98
	my knowledge of educational policies and legislation	29.09	18.73	17.25	14.11	13.07	7.75	3	2.69
	my personal aptitudes to be a teacher	15.59	12.11	12.46	13.68	19.86	26.31	4	3.25
	my commitment to the school's ideology	39.11	13.15	10.19	10.89	11.41	15.24	2	3.62
	my linguistic competence in English	55.05	9.58	9.67	6.01	6.97	12.72	1	3.40

Source: original work.

Beyond the results of the sample overall, the significant differences are also relevant (see Table VII) given that they are found ($p<.05$) in all the items, both in terms of the educational stage at which they teach (except in one item) as well as the type of school. It should be noted that, in this dimension, for ownership, the sample effect size on "my personal aptitudes to be a teacher" is intermediate ($r=.39$) whereas on "my commitment to the ideology of the school" is strong ($r=.53$).

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TABLE VII. Significant differences in the assessment of aspects of entry into the profession.

Item		Stage		Years Experience			Ownership	
		Mann-Whitney U	p	Kruskal-Wallis H	gl.	p	Mann-Whitney U	P
I believe that in my selection/ hiring process they valued…	the adequacy of my curricular knowledge of the subjects I would teach	125566.0	.000*	21.429	5	.001*	139597.0	.001*
	my skills at putting together didactic programs	127518.5	.000*	12.160	5	.033*	118686.0	.000*
	my knowledge of different types of educational methodologies and innovations	118926.5	.000*	10.146	5	.071	146063.5	.046*
	my skills with regard to tutoring and/ or guiding students	112401.5	.000*	9.908	5	.078	111050.5	.000*
	my skills with regard to giving guidance and support to families	114727.5	.000*	9.191	5	.102	109331.0	.000*
	my possibilities of attending to the comprehensive development of the students	108065.5	.000*	9.895	5	.078	104466.5	.000*
	my knowledge of educational policies and legislation	133216.5	.000*	25.512	5	.000*	107607.0	.000*
	my personal aptitudes to be a teacher	141040.5	.001*	3.675	5	.597	85816.5	.000*
	my commitment to the school's ideology	126459.0	.000*	6.724	5	.242	61277.0	.000*
	my linguistic competence in English	151857.5	.143	91.553	5	.000*	119160.0	.000*

* $p < .05$
Source: original work.

Turning to the statements on how the selection process for entry into the profession should be (see Tables VIII and IX), teachers clearly disagree with the suitability of the "current system of teacher selection/ hiring" in public schools (competitive examinations). Indeed, only 12% of them strongly agree with the statement. A comparison of independent variables shows significant differences for this item depending on the ownership of the school (p=.014), given that teachers who work at private/charter schools give a worse score to entry into the public system. Significant differences are also found according to age (p=.000), with a tendency in which the less teaching experience, the worse the competitive examination system is valued. No significant differences were found by

educational stage (p=.293). Continuing with entry into teaching at public schools, we find a high distribution of teacher responses regarding the statement that "public schools should have greater autonomy to hire their teaching staff", with roughly 20% of teachers strongly agreeing and the same percentage strongly disagreeing. An analysis of the significant differences by ownership (p=.000) shows that 39.9% of public school teachers have a low level of agreement (1-2) with the statement, while 47.5% of teachers in private/charter schools have a high level of agreement (5-6). Similarly, with respect to the stage (p=.000) 45% of Primary Education teachers agree (levels 5-6) with greater autonomy in hiring, while 36.3% of Secondary Education teachers do not agree (levels 1-2) with it.

TABLE VIII. Assessment of measures on entry into the profession.

Item	Percentages						Me	Var
	1	2	3	4	5	6		
The current system for selecting teachers to enter the teaching profession in public schools (competitive examinations) is adequate	25.20	25.72	19.79	17.09	8.11	4.10	2	2.04
Public schools should have greater autonomy in hiring their teaching staff	20.52	11.18	16.33	15.02	17.29	19.65	4	3.23
The current system for selecting teachers to enter the teaching profession in private and charter schools is adequate	34.25	19.59	23.04	11.21	8.38	3.53	2	2.09
The Education Administrations should define common criteria for selecting teachers to enter public and chartered schools	5.34	4.99	11.47	13.40	20.84	43.96	5	2.25
In teacher selection systems, more importance should be given to knowledge of the subject matter to be taught than to didactic-pedagogical training	23.93	26.29	24.72	14.76	6.29	4.02	2	1.86

Source: original work.

In their assessment of the "current system for selecting teachers to enter the teaching profession in private and charter schools", teachers do not consider it to be suitable: nearly 35% consider it very unsuitable. As in the previous item, significant differences are found according to both the

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educational stage (p=.000), with a worse score from Secondary Education teachers, and ownership (p=.000), where there is a difference of more than 20 percentage points from that low score of 1 (21.8% of those who work in private/charter schools compared to 42.2% in public schools). In addition, teachers are in majority agreement (more than 80% gave scores from 4 to 6) with defining "common criteria for teacher selection and entry into public and charter schools"; This statement is qualified by the significant differences found according to both the educational stage (p=.013) and ownership (p=.000), where Secondary Education teachers and public school teachers are more in agreement with standardizing criteria. Finally, teachers were asked about the contents of these selection and hiring systems, and most of them disagreed (almost 80% gave a score of 1 to 3) that "more importance should be given to knowledge of the subject matter to be taught than to didactic-pedagogical training". In this case, no significant differences were found in terms of the ownership of the school (p=.071), although differences were found according to the stage (p=.000), where the lower scores (from 1 to 3) fall from 83% of Primary Education teachers to 69% of Secondary Education teachers.

TABLE IX. Significant differences in the assessment of measures on entry into the profession.

Item	Stage		Age			Ownership	
	Mann-Whitney U	p	Kruskal-Wallis H	gl.	p	Mann-Whitney U	P
The current system for selecting teachers to enter the teaching profession in public schools (competitive examinations) is adequate	153220.0	.293	35.593	5	.000*	143380.5	.014*
Public schools should have greater autonomy in hiring their teaching staff	128685.5	.000*	8.231	5	.144	120543.0	.000*
The current system for selecting teachers to enter the teaching profession in private and charter schools is adequate	135526.5	000*	3.420	5	.636	105597.0	.000*
The Education Administrations should define common criteria for selecting teachers to enter public and chartered schools	144650.0	.013*	9.526	5	.090	126703.0	.000*
In teacher selection systems, more importance should be given to knowledge of the subject matter to be taught than to didactic-pedagogical training	125343.0	.000*	1.688	5	.890	146146.0	.071

* $p < .05$

Source: original work.

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Conclusions

For more than a decade there have been reports in Spain in which in-service teachers insist that their initial training could have been much improved (Gortazar and Zubillaga, 2019; Martín, 2010; Valle and Manso, 2018). The research presented here confirms the low scores teachers give to their initial training and the process of entry into the profession. It also offers important new insights into the interpretation and understanding of these data.

In the results on initial formation, what can be seen is a double tension: on one hand, between the distribution, integration, and relevance of the contents of initial training programs and, on the other hand, between Primary and Secondary Education teachers as a result of the differentiated models in which they are trained (concurrent and consecutive, respectively).

With regard to the content of initial training programs, the results point to a first consideration regarding the weight of the theoretical and the practical. Teachers gave a very positive assessment of the module of practicum teaching at schools during their initial training. This holds especially true compared with the rest of the contents (of a theoretical nature) of the initial training they were asked to score. The data point to the important role that professional practicums should play in this first stage for teachers. However, their integration with the rest of the training modules is known not to be easy (Orland-Barak and Wang, 2021).

The greatest contribution of the research on the initial training block lies (within the theoretical content) in the relationship between training in disciplinary content (mastery of the content to be transmitted) and in didactic and psycho-pedagogical content. Although all the aspects consulted receive some negative evaluations, training in disciplinary content is the one that teachers score the highest stands out, which indicates that the university prepares them especially well in this aspect. This is in line with the historical purpose of the university, although it clashes with the growing social and professional demands towards this institution. As some authors point out (Alonso-Sainz and Thoilliez, 2020; Esteban, 2016) initial training in universities has to help reinforce the teachers' strong and solid passion for knowledge. However, this itself does not necessarily contradict (Valle and Manso, 2018) the fact that, in addition, student teachers must begin to acquire the competencies

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of their profession. It is essential for initial teacher training to ensure a high degree of mastery of both disciplinary and didactic and psycho-pedagogical content. Even so, the results of the research seem to indicate (when teachers are asked about what is "most important") that teachers (also those of Secondary Education) consider didactic and psycho-pedagogical training to be more necessary than disciplinary training.

This assertion induces discussing the results in light of the concurrent and consecutive models (and their consequences), which are so different for Primary and Secondary Education teachers, respectively, in Spain. The concurrent model emphasizes didactic and psycho-pedagogical training, while the consecutive model emphasizes training in the discipline. The results obtained show that teachers are in favor of there not being such great differences in the training received by those who teach at one stage or another. The majority of teachers (including those in Secondary Education) support concurrent initial training models that integrate training in disciplinary, didactic, and psycho-pedagogical content.

In regard to the selection and hiring processes for entering the profession, as in the case of initial training, teachers consider that only "curricular content" was clearly taken into account in their own selection. This fact is related to the same discussions that have been held about initial training. Furthermore, these results may also explain why, in general terms, teachers disagree with the current system of competitive examinations, as well as with the hiring procedures in private and charter schools, and, on the contrary, they agree with harmonizing the selection processes between public and charter schools. As we saw in the introduction, in Spain entry into the profession is determined by the ownership of the school where the teacher will work. Accordingly, it is consistent to have found repeated differences in this block between teachers who work at public schools and those at private and charter schools.

The main limitations of our study were, on one hand, related to sampling, given that, on the recommendation of the Ethics Committee, the instrument could not be disseminated through social media (or other similar channels) but only by email to the schools and, on the other hand, related to the statistical analyses, since non-parametric tests had to be performed because the ordinal variables did not comply with normality. An attempt was made to construct an index through factor analysis with factor loadings and indicators, but no consistent model was found.

Based on the results, a number of prospective measures should be noted given that teachers highlighted a need to improve how to get started in the profession. All the recommendations in this regard require, first of all, an intensive relationship between the educational administration authorities, universities, and schools. In relation to initial training, it is essential to work on achieving correct integration of theory and practice, as well as disciplinary, didactic, and psycho-pedagogical contents. This debate needs to take place within the framework of initial training models: we know that initial training is essential for configuring a professional identity and the fact of opting for one model over another conditions these differences. It would be opportune to be able to consider mixed models of initial training for both stages. Indeed, this recommendation would align nicely with international trends (Eurydice, 2018; OECD, 2019a). In addition to the models, we must bear in mind that the qualifications for Primary Education teachers and Secondary Education teachers are not the same (requiring a bachelor's degree and master's degree respectively) and this also has enormous implications for the configuration of the profession (Bolívar and Pérez-García, 2019; Imbernón, 2019). For example, those who work in public schools will belong to different groups of civil servants, which means their working conditions will be different even though their professional practice is very similar. In this sense, teachers recognize that the current system of competitive examinations is inadequate. Moreover, it seems appropriate to generate some kind of mechanism by which the education administration authorities can dictate some specification regarding teachers at charter schools, if only because their salaries are paid by the public treasury. All of this points to the recommendation to implement an induction system for hiring new teachers. The recently approved LOMLOE includes in its seventh additional provision the obligation to make a normative proposal that regulates teacher training. This is a historic opportunity to address a long-standing debate in Spain in which there is a broad consensus among civil society, the educational community, and political parties.

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Training for inclusive education in preservice programs for Primary Education teachers in Spanish universities

La formación para la educación inclusiva en los títulos de maestro en educación primaria de las universidades españolas

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Abstract

The recent approval of the new education law in Spain –LOMLOE– represents a firm commitment to inclusion as the guiding principle of the educational system, enhancing compliance with the agreements signed by Spain after the ratification of the Convention on the Rights of Persons with Disabilities and with the 4th objective of the 2030 Agenda, to ensure the right to inclusive education. Moving towards an inclusive school is a complex process, with implications for educational policies, school cultures and the role of teachers and consequently, their initial training is a key issue. Recent studies reveal that primary education teachers do not feel prepared to provide adequate educational attention to diverse students, stating not having received appropriate initial training on this subject. Therefore, it is relevant to consider what kind of inclusive education training is being taught at universities to future teachers. In the present study, the curricula of the current and active teaching degree for Primary Education of the 39 Spanish public universities have been reviewed, to identify the specific subjects on inclusive education and attention to diversity. Also, the syllabuses for these subjects have been analyzed to specify the underlying training approach, based on a predefined frame of reference. The results show variability among universities both in the number of compulsory subjects, which varies in a range

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from zero to three, and in the training focus, finding an unbalanced presence of different approaches. The implications of the unequal attention paid to inclusion in the different universities are discussed and recommendations are made to guarantee the adequate handling of this subject in the academic programs, which may be useful for the forthcoming reform of the teaching profession, foreseen in the LOMLOE.

Keywords: Pre-service teacher education, Inclusive education, Primary education, Teacher education curriculum, Syllabus.

Resumen

La reciente aprobación de la nueva ley educativa en España – LOMLOE – supone una apuesta decidida por la inclusión como principio rector del sistema educativo, avanzando en el cumplimiento de los compromisos adquiridos con la ratificación de la Convención de Derechos de las Personas con Discapacidad y con el objetivo de la Agenda 2030 de hacer efectivo el derecho a la educación inclusiva. Transitar hacia una escuela inclusiva es un proceso complejo con implicaciones para las políticas educativas, las culturas de los centros y el rol de los docentes, resultando clave su formación inicial. Recientes estudios revelan que el profesorado de educación primaria no se siente preparado para proporcionar una adecuada atención educativa a la diversidad, declarando no haber recibido suficiente formación inicial al respecto. Resulta relevante, pues, examinar qué formación sobre educación inclusiva se está proporcionando a los futuros docentes desde las universidades. En el presente estudio se han revisado los currículos de los grados de Maestro en Educación Primaria de las 39 universidades públicas españolas con el grado en vigor para identificar las asignaturas específicas sobre educación inclusiva y atención a la diversidad, y se han analizado las guías docentes de dichas materias para precisar el enfoque formativo subyacente a partir de un marco de referencia predefinido. Los resultados muestran variabilidad tanto en el número de asignaturas obligatorias presentes en las distintas universidades, que varía en un rango de cero a tres, como en la orientación de la formación, encontrándose una presencia desequilibrada de los diferentes enfoques. Se discuten las implicaciones de la desigual atención que recibe la inclusión en las diferentes universidades y se apuntan recomendaciones para garantizar el adecuado tratamiento de esta materia en los planes de estudio, lo cual puede resultar útil de cara a la próxima reforma de la profesión docente, prevista en la LOMLOE.

Palabras clave: formación inicial del profesorado, educación inclusiva, educación primaria, plan de estudios, guía docente.

Introduction

The growing heterogeneity of students in Spain represents a real challenge for its educational system. Between the 2011-2012 and 2018-2019 academic years, the number of students with specific needs of educational support (known in Spain by the acronym ANEAE) increased by 72% in primary education, representing an increase from 6.8% to 11.7% of the total number of students enrolled in school. Furthermore, in 2018-2019 the percentage of students of foreign origin reached 10.5% for this stage of education (MEFP, 2020). This challenge is of particular concern to teachers, who are expected to provide learning opportunities for all students in a competent manner, while considering their different needs and abilities. However, the available evidence shows that a large part of the active teaching staff does not feel prepared to attend to diversity. In the latest edition of the TALIS study, 27% of Spanish primary education teachers stated that the area in which they had the greatest need for training was teaching students with special educational needs (known in Spain by the acronym ANEE). In addition, 18% recognized the great need for learning about teaching in multicultural or multilingual settings (MEFP, 2019). Both percentages are higher than the OECD and EU averages (OECD, 2019). This perceived lack of preparedness already appears during preservice teacher training. Studies carried out in different Spanish universities reveal that students in teacher training do not feel competent to give an adequate response to diversity, despite presenting a positive attitude toward inclusive education (Cardona, 2009; Izuzquiza et al., 2015).

This data leads us to question whether preservice training programs for teachers in our country are falling behind in regard to this issue. Various authors have pointed out that attention to diversity is an aspect that is not addressed enough in these programs (Cotán and Cantos, 2020; López-Torrijo and Mengual-Andrés, 2015). The TALIS results support this statement, with Spanish teachers declaring having received the least training during their teaching studies in two areas: teaching in mixed ability settings and teaching in a multicultural and multilingual setting, which was reported by 57% and 39%, respectively. This places us at the back of the line, lagging behind the rest of the countries. For those who have joined the profession during the last five years these percentages barely reach 68% and 60% (MEFP, 2019).

In this context, European institutions have already pointed out that, although there are general requirements at the national level that universities must adhere to when designing their teacher training curriculum, they do not establish the obligation to incorporate specific subjects on educational attention to diversity (Commission, 2017a). Although the teaching profession is a regulated professional activity in Spain, which allows the government to establish the degree requirements and the conditions that the curriculum must meet, the truth is that universities are given a lot of autonomy to adjust the subjects they offer to these conditions.

As Tiana (2013) argues, the 2007 reform gave universities a wide margin to design the teacher training curriculum. The regulations that govern the teaching degree for Primary Education[1] since 2007 include a series of competences to be developed, in which we find those related to diversity issues. However, it does not determine the obligation to offer subjects in this regard. This is a contrast with previous regulations[2] to the 2007 reform that, unlike this one, detailed the compulsory subjects very precisely (along with the contents and credits associated with them), including the so-called "Psycho-pedagogical Foundations of Special Education".

Although the Commission (2017b) does not deny certain advantages derived from this decentralization, it also warns that it can be detrimental with regard to the introduction of diversity content in the curriculum, drawing attention to the fact that in many countries the educational offer has been reduced to one single, often optional, subject.

In addition to the weight assigned to attention to diversity in preservice teacher training, the underlying approach should be considered. For a time, the training revolved almost exclusively around issues related to students with special educational needs, being able to differentiate two approaches (Parrilla, 1992): categorical or traditional (training focused on the deficit of the students with special educational needs and on special methodologies for each category of students) and non-categorical or polyvalent (aimed at implementing educational programs of an integrative nature), also called deficit and integrative (Muntaner, 1999) or categorical and non-categorical (Gallego and Rodríguez, 2007). More recently, the European Agency for Special Needs and Inclusive Education

(1) Order ECI / 3857/2007, of December 27, which establishes the requirements for the verification of official university degrees that enable the professional practice of the Primary Education Teacher.

(2) Royal Decree 1440/1991, of August 30, which establishes the official university teaching qualification, in its various specialties and the general guidelines of the curriculum leading to its completion.

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(Agency, 2011) identified two opposing positions between EU countries: one focused on disability and special needs versus the other concerned with responding to the diversity of the student population.

In this duality we can recognize two underlying perspectives regarding which students are considered to make up the so-called "diverse" group: a restricted vision, circumscribed to the students with special educational needs and based on the classic assumptions of special education, and a broad vision that considers the diversity as a transversal quality for all people and that is typical of the inclusive education paradigm. Despite the fact that this last broader interpretation is being taken on at an international level, there is no solid consensus on the concept of inclusive education, leaving some countries relying on a concept of "inclusion" as the education of people with disabilities (UNESCO, 2020a). Different authors recognize a greater variability of approaches when considering the subject. Clough and Corbett (2000) refer to five perspectives from which the thinking and understanding of inclusive education has been articulated: 1) *Psycho-medical legacy*, focused on the deficit of students and their diagnosis and treatment; 2) *Sociological response*, which emphasizes how sociocultural variables influence the educational experience; 3) *Curricular approach*, concerned with the curriculum meeting the educational needs of all; 4) *School improvement strategies*, interested in organizational factors and in promoting inclusive schools; and 5) *Disability studies critique*, which incorporates the vision of other disciplines. Likewise, Ainscow et al. (2006) identify six ways of conceptualizing inclusion through: 1) *disability and special educational needs*; 2) *behavioral issues*; 3) *groups vulnerable to exclusion*; 4) *school for all*; 5) *"Education for All"*; and 6) an approach based on *principles and values*.

The truth is that the broad conception of inclusion as the paradigm aimed at increasing the presence, participation, and success of all students (Booth and Ainscow, 2011) is being consolidated both in academic and social discourses and in national and international educational policies. The Convention on the Rights of Persons with Disabilities - CRPD (UN, 2006) established inclusive education as a right for all people. Furthermore, the 2030 Agenda has set a calendar to make this right effective through the sustainable development objective SDG-4: "Ensure inclusive education" (UN, 2015), referring to all students, with a special focus on those groups most affected by the processes of educational exclusion due to variables such as disability, gender, migration, sexual identity and

orientation, or economic capacity, among others (UNESCO, 2020a). In regard to Spain, the recently approved LOMLOE[3] has adopted inclusive education as a fundamental principle in basic education, explicitly committing itself to the CRPD and the 2030 Agenda, and has established that within ten years, educational centers must be prepared to meet the needs of students with disabilities, which has important implications for teacher training.

Teachers are a key factor to advance toward inclusive education (Durán and Giné, 2011; Echeita, 2014; UNESCO, 2017; Zeichner, 2010) and preservice training constitutes an essential element in their ability to shift this paradigm (Muñoz- Fernández et al., 2019; Rebolledo, 2015; Tárraga et al., 2013). It has been pointed out that focusing training exclusively from a deficit categorical approach can be counterproductive and inappropriate for teaching (Agency, 2011; Slee, 2012; Thomas and Loxley, 2007). By contrast, betting on broader approaches (Arnaiz, 2003), focused on the curriculum, teaching methods or interculturality, has shown greater effectiveness for the training of inclusive teachers (Commission, 2017b). This latest Commission report, which analyzes the role of preservice teacher training on attention to diversity in European countries, clearly states that competency-based systems with transversal and comprehensive curricular approaches are the best way to pedagogically address this question. This transversality is also referred to by UNESCO (2020b), which also bets on inclusive approaches becoming the fundamental element of the general readiness of teachers in terms of attention to diversity, and does not reduce it to managing specialized content for certain types of students. Several countries have incorporated this approach into their educational policies. For example, the Education Department of Upper Austria integrates inclusive pedagogical competences in all its subjects, from the proposed transversal approach; or in South Africa, the guidelines for inclusive teaching revolve around the principle of inclusion and putting into practice the adaptation of the curriculum to the needs of the student body (UNESCO, 2020b). This effort to plan teacher training from a framework of transversality not only contributes to increasing inclusion, but also avoids the divergences that occur between the training itineraries for special education teachers and general teachers.

The data from the studies to which we have been referring to in previous lines, question whether or not preservice teacher training in our

(3) Organic Law 3/2020, of December 29, which modifies Organic Law 2/2006, of May 3, on Education.

country is adequately responding to the challenge of preparing teachers to make inclusive education effective. In fact, in a recent report by the European Agency (2018), the Spanish political authorities themselves recognized that teacher training in universities should be improved to incorporate more aspects related to inclusion. The LOMLOE foresees the development of a regulation for preservice teacher training, which will probably entail modifications of Order ECI / 3857/2007 and, consequently, a reformulation of the academic programs of university teaching degrees. This represents an excellent opportunity to address potential gaps in these programs, if any, with regard to inclusive education.

It therefore becomes relevant to review to what extent Spanish universities are currently training future teachers in diversity issues and, if so, whether the focus of the training is aligned with the premises of inclusive education, aspects that are addressed in the study that we present below. Unlike previous works, such as that of López-Torrijo and Mengual-Andrés (2015), focused on the training curriculum for secondary school teachers, or that of Vélez-Calvo et al. (2016), whose results refer exclusively to the presence of specific subjects in quantitative terms, our study provides information both on the presence and on the approach used in the inclusion subjects in the academic program for the teaching degree for Primary Education. This review, carried out at the end of the stage that began with the 2007 reform, may be useful to guide decision-making for the new reform.

Method

The general objective of this work was to understand the training in inclusive education and attention to diversity (IEAD) that students in Primary Education degrees from Spanish universities are receiving through the offer of specific subjects on the matter. For this, we proposed an exploratory descriptive research study which implied, on the one hand, the review of the academic programs of the different universities that offer the degree to identify the subjects specifically designed to cover content on IEAD, and, on the other, the analysis of the respective programme of study (syllabus) to determine the underlying approach of the training provided as well as the content included.

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Sample

The review covers the curriculum currently in place at all the Spanish publicly owned universities that teach the Primary Education degree[4]. To identify the sample, we relied on the information available in the Registry of Universities, Centers and Titles (RUCT) of the Ministry of Universities [5], according to which there are 39 public universities that offer the degree for the 2020-2021 academic year.

Based on the official statistics on university education, the number of students enrolled in this degree stood at 75,192 for the 2019-2020 academic year, with 57,154 belonging to the 39 public universities included in our analysis. Thus, the results that we present refer to the training received by 76.01% of future primary school teachers.

Our focus was placed on compulsory subjects, given that they constitute the common training that all students receive. The optional subjects were excluded from the study because it is only possible to guarantee that the students who take these courses receive the respective training in IEAD, which in turn also depends on multiple variables, such as the willingness to choose said subjects or their availability. In addition, in most universities the credits necessary to obtain a specialization are linked to elective credits, thus reducing the possibilities of choice for students seeking a specialization. In fact, in 21 of the 39 universities (53.8%) the credits associated with the specialization cover the totality of the elective ECTS of the academic program, which eliminates the possibility of taking any optional subject not connected to the specialization, including, when available, those related to IEAD.

Analysis framework and instruments

The review of the syllabuses focused on three nuclei of analysis, using the contents in them as the main source of information. First, to identify whether the subjects provided basic training aimed at developing a conceptual framework on inclusive education (e.g., contents related to the history and stages in educational attention to diversity, schooling models

(4) The name varies from one university to another.
(5) RUCT: https://www.educacion.gob.es/ruct/home. Date retrieved: 23/10/2020

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-exclusion, segregation, integration, inclusion-, distinction between special and inclusive education, international policies, etc.) and/or regulatory information (state and regional legislation in this regard). Second, to recognize the approach or perspective underlying the training. Third, to specify what type of diversity or what specific groups of students are explicitly referred to in the contents: students with special educational needs, gender equality, affective-sexual diversity, socioeconomic differences, issues related to migration and multiculturalism, etc.

To identify the underlying approach of the subjects, a reference framework was defined based on the different perspectives surrounding inclusive education (Ainscow et al., 2006; Clough and Corbett, 2000) and on the training approaches in attention to diversity (Parrilla, 1992; Muntaner, 1999) referred to in the theoretical introduction. Four non-exclusive approaches were identified in terms of their focus or content:

- **Curricular**. Seeks to respond to diversity from the curriculum, overcoming learning barriers: teaching methods, flexible evaluations, classroom organization, scaffolding, grouping, etc.
- **School improvement**. Contents aimed at moving toward an inclusive school for everyone: organization of the center, learning communities, participation of the educational community, barriers in the cultures and policies of the center, coexistence, etc.
- **Psycho-pedagogical**. Attention is directed to the study of specific groups of students, mainly students with specific needs of educational support but also other profiles (e.g.: risk of social exclusion or behavior problems). Importance of psycho-pedagogical evaluation and intervention. We distinguish two sub-approaches:
  - ***Traditional or categorical***: each topic focuses on the diagnosis, etiology, classification, and treatment of a type of disability, developmental disorder, or learning disability.
  - ***Polyvalent or non-categorical***: the contents on students with specific needs of educational support do not occupy the entire agenda and are approached from a broader perspective in which other approaches are present.
- **Based on values**. Contents related to the development of the values and principles of a diverse school: Human Rights, equal opportunities, tolerance, democratic schools, participation, non-violence, sustainability, etc.

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To ensure the systematic review of the syllabuses, an *ad hoc* rubric was designed consisting of a series of indicators that made it possible to verify the presence or absence of specific content on IEAD and to assign the identified approaches.

Procedure

The study was developed in the last quarter of 2020 with updated information on the current academic programs during the 2020-2021 academic year, covering three phases:

- Phase 1. Identification of universities and compilation of current academic programs through the RUCT (with access to the official publication of the programs in the Spanish official gazette BOE) and the university web pages. After that, the specific compulsory subjects on IEAD were identified based on their name, establishing an inclusion criterion that expressed reference be made to the subject from any perspective or approach, with terms such as diversity, educational inclusion, special education, educational needs, disorders, learning difficulties, inclusive school, interculturality, equality, values, etc. Four subjects belonging to the disciplines of Sociology and Anthropology were discarded despite containing some of these terms in their name, as they were not specific subjects on IEAD.
- Phase 2. Compilation and analysis of the syllabuses for the identified subjects. These were reviewed by one of the researchers using the designed rubric, attending to the three nuclei of analysis previously identified: basic content, underlying approach and types/groups of diversity referred to.
- Phase 3. Systematization and statistical processing of the information. All the information referring to the identified subjects, contents and assigned underlying focus, resulting from the review of the academic programs and syllabuses, was systematized in a summary table that can be found in Annex I. The data was treated quantitatively, calculating the number of subjects and the percentage they represented on the total for each of the three nuclei of analysis. Given that several universities had more than one subject on IEAD, which could imply that an aspect not covered in one subject was covered by another one in the same academic program, the corre-

sponding calculations were carried out taking the university as the unit of reference, instead of the subject.

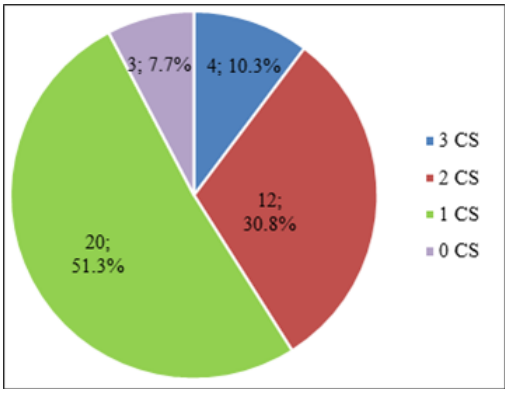
Results

A summary of the results can be found below. In the first place, we refer to the data associated with the number of compulsory subjects on IEAD identified in the set of academic programs, as well as a preliminary analysis of their names. Second, we describe the findings derived from the review of the programmes of study for the identified subjects for each of the three pre-established analysis nuclei.

Presence of subjects on IEAD and analysis of their names

The review of the academic programs reveals the variability in the number of compulsory subjects on IEAD offered by the universities, ranging from zero to three. As shown in Figure 1, we find that of the 39 public universities, 4 include three subjects in this regard (18 ECTS), 12 offer two subjects (9-12 ECTS) and 20 universities only have one (6 ECTS). The remaining three universities do not offer any. In total we have identified 56 subjects.

FIGURE 1. Number of universities according to the number of compulsory subjects on IEAD.



If we look at the number of primary education teaching students enrolled in the different universities, we observe that 8.2% of future teachers will have completed three subjects with content on the subject by the end of their studies, 36.0% two subjects, and 48.8% a single subject. The percentage of students enrolled in one of the three preservice teacher training programs without compulsory subjects on IEAD represents 7.1%.

As a first step to understand the contents and approaches present in the academic programs, we analyzed the title of the subjects. As can be seen in the list of subjects in the annexes, there is hardly any literary coincidence, with the greatest consensus found surrounding three names: Difficulties and/or Disorders of Development and Learning (N=8) (if we only consider "development" or "learning", the number is greater), Psycho-pedagogical/psychological Foundations/bases of Attention to Diversity (N=5) and Attention to Diversity (N=3). The key terms that appear most frequently in the titles are diversity (N=19), difficulties (N=14), inclusion/inclusive (N=11), disorders (N=9), bases/foundations (N=9), psycho-pedagogical/psychoeducational (N=7) and psychology/psychological, school, coexistence and values (N=4 each term).

Grouping the subjects around thematic affinity (see Annex II), we verify that the biggest group is made up of those that have the words difficulties or disorders in their title (30.4%), followed by the groups of those that refer to attention to diversity (23.2%) and bases and foundations (19.6%). With less presence are those that refer to inclusion (14.3%) and the ethical component of educational intervention (12.5%).

The terminological analysis reveals the existing heterogeneity in terms of the name of the subjects, which seems to point to a lack of consensus in relation to what future teachers have to learn about IEAD in their preservice training.

Basic contents: conceptual and regulatory framework of reference

As can be seen in Table 1, 27 out of 39 universities (69.2%) have at least one subject that includes a topic/block with content aimed at providing teaching students with a conceptual framework of reference on inclusive education. In the case of the regulatory framework, only 15 universities (38.5%) include training on the legislation that regulates attention to diversity in the Spanish educational system. If we group the universities

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according to the number of compulsory subjects offered and we disaggregate the previous data for each of the resulting groups, we verify that said contents are covered in 100% of the academic programs that include 3 CSs, while the percentage decreases for programs that have 2 or 1 CS. This drop is especially appreciated in the case of the regulatory framework, which is only addressed in 50.0% of the universities that offer 2 CSs and 25.0% of those that offer 1 CS.

TABLE I. Number of universities with basic contents related to the conceptual and regulatory framework.

	N° OF OFFERED CS	N° UNIV / GROUP	N° (%)UNIVERSITIES WITH TRAINING IN BASIC CONTENTS	
			Conceptual Framework	Regulatory Framework
GROUP	3 CS	4	4 (100%)	4 (100%)
	2 CS	12	9 (75.0%)	6 (50.0%)
	1 CS	20	14 (70.0%)	5 (25.0%)
	0 CS	3	-	-
	TOTAL	**39**	**27 (69.2%)**	**15 (38.5%)**
ENROLLED STUDENTS		**57,154**	**42,251 (73.9%)**	**24,574 (43.0%)**

Paying attention to the number of enrollments of each university, the proportion of teachers in primary education that will have completed a compulsory subject by the end of their initial studies in which a conceptual and/or regulatory framework of reference is provided reaches 73.9% and 43.0%, respectively.

Training approach on IEAD

Most of the identified subjects address content on inclusive education and attention to student diversity from more than one perspective. However, these approaches do not appear in a balanced way in the academic

programs as a whole, as can be seen in Table 2. At a first glance, we observe that there is a clear predominance of the psycho-pedagogical approach, which is present in 36 out of the 56 subjects (64.3%). By far, it is followed by the contents closest to the curricular and school improvement approaches, present in both cases in 21 subjects (37.5%). Finally, those subjects that consider the subject from a values-based approach are limited to 7 (12.5%).

TABLE 2. Number of subjects that include each approach (by university group).

	N° OF OFFERED CS	N° UNIV / GROUP	N° OF TOTAL SUBJECTS / GROUP	N° (%) SUBJECTS INCLUDING EACH PERSPECTIVE/APPROACH			
				Curricular	School Improvement	Psycho-pedagogical	Values
GROUP	**3 CS**	4	12	4 (33.3%)	5 (41.7%)	6 (50.0%)	2 (16.7%)
	2 CS	12	24	7 (29.2%)	12 (50.0%)	13 (54.2%)	5 (20.8%)
	1 CS	20	20	10 (50.0%)	4 (20.0%)	17 (85.0%)	0 (0%)
	0 CS	3	0	-	-	-	-
	TOTAL	**39**	**56**	21 (37.5%)	21 (37.5%)	36 (64.3%)	7 (12.5%)

The preeminence of the psycho-pedagogical approach over the rest of perspectives is found in all university groups, regardless of the number of compulsory subjects offered; although, this becomes more pronounced in the group of those that only have 1 CS. Thus, the psycho-pedagogical perspective, whose presence in the 3 CS and 2 CS groups is around 50%, shoots up to 85.0% in the 1 CS group. The greater weight of this approach coincides with a lower focus on the school improvement perspective, present in 20.0% of the subjects, and with the disappearance of the values approach in this group.

The previous analysis can be complemented by using the number of universities in which each approach is present as a reference, data that we have collected in Table 3. This data informs us about how many universities incorporate each of the approaches through any of their offered

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compulsory subjects. Consequently, it allows us to calculate how many students will have received training from different perspectives throughout their academic career. For example, Table 2 shows that the school improvement approach is present in 21 out of 57 subjects (37.5%), while as reflected in Table 3 we know that these 21 subjects are taught in 18 of the 39 universities (46.2%), which enroll 51.5% of all students.

TABLE 3. Number of universities including each approach (by university group).

	Nº OF OFFERED CS	Nº UNIV / GROUP	Nº (%) UNIVERSITIES INCLUDING EACH PERSPECTIVE/APPROACH				AVERAGE Nº OF APPROACHES / GROUP
			Curricular	School Improvement	Psycho pedagogical	Values	
GROUP	3 CS	4	4 (100%)	4 (100%)	4 (100%)	2 (50.0%)	3,5
	2 CS	12	7 (58.3%)	10 (83.3%)	11 (91.7%)	5 (41.7%)	2,8
	1 CS	20	10 (50.0%)	4 (20.0%)	17 (85.0%)	0 (0%)	1,6
	0 CS	3	-	-	-	-	-
	TOTAL	**39**	**21 (53.8%)**	**18 (46.2%)**	**32 (82.1%)**	**7 (17.9%)**	**2,0**
ENROLLED STUDENTS		**57,154**	**32,319 (56,6%)**	**29,445 (51.5%)**	**48,605 (85.0%)**	**9,182 (16.1%)**	-

As we have already pointed out from the data referring to the subjects, we observe that the different approaches have also been present very unevenly in the total set of 39 universities. In descending order, we find the psycho-pedagogical approach in 32 universities, curricular in 21, school improvement in 18 and, finally, the values-based approach in 7. This imbalance is not manifested with the same magnitude in all universities, but there are substantial differences depending on the number of subjects offered on IEAD. Thus, in those that offer 3 CSs, it turns out that all the approaches are present in 100% of the universities that make up this group, with the exception of the value-based one, which is included

in half of these institutions. At the opposite end we find the group of universities that only have 1 CS in their academic program, in which the greatest disproportion between approaches is revealed, with a presence of the psycho-pedagogical perspective in 85.0% of the cases, curricular in 50.0% and school improvement in 20.0%, the values-oriented perspective disappearing.

In light of the data presented so far, we can make two observations. In the first place, that in universities that have more than one compulsory subject and, therefore, allocate a greater number of credits to training in IEAD, the opportunities for students to receive a more comprehensive training are increased, by having the possibility of accessing more content and from different approaches. This can be corroborated considering the average number of approaches present in each group of universities (collected in the last column of Table 3). In the 3 CS group, the mean of approaches is $\bar{x} = 3.5$, while in the 1 CS group the value decreases to $\bar{x} = 1.6$. This assessment also applies in relation to the aforementioned contents intended to provide a basic conceptual and regulatory framework on the subject, an aspect that, as we have seen, is only guaranteed in universities with 3 CSs.

Secondly, it is found that in the preservice training that teachers receive on IEAD, a psycho-pedagogical preference is indisputably imposed. The data indicate that a large majority of future teachers (85.0%) will have been trained in this regard from a psycho-pedagogical approach by the end of their studies. However, only slightly more than half will have received training to respond to the diversity of the student body from a curricular perspective or focused on school improvement (56.6% and 51.5%, respectively) and only 16.1% from a values-based approach. In fact, in universities that allocate the least ECTS for compulsory subjects on the topic (1 CS), the approach that seems to be least affected by this limitation is the psycho-pedagogical one, prevailing in 17 of the 20 universities, coinciding with a lower presence of other approaches (e.g., school improvement in 4 universities and values-based in none).

Within the group of subjects in which we have identified the psycho-pedagogical approach, and according to our predefined frame of reference, we can distinguish two sub-approaches: traditional or categorical and polyvalent or non-categorical. In Figure 2 we have represented the distribution of these sub-approaches in the 36 subjects in which the psycho-pedagogical perspective is present. The number of subjects most

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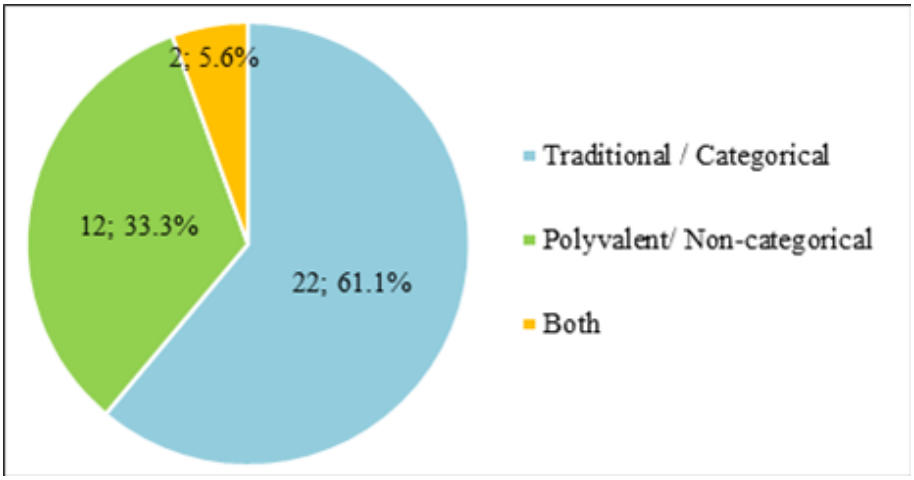
aligned with the traditional approach amounts to 22 (61.1%), while those closest to the polyvalent approach stands at 12 (33.3%). In 2 subjects (5.6%) we found both approaches, being divided into two differentiated blocks, taught by two different departments.

FIGURE 2. Distribution of traditional and polyvalent approaches in psycho-pedagogical subjects.



Going a little deeper in this regard, the data show that 10 out of 20 universities that only offer 1 CS (and in which 24.0% of all students from public universities are trained), offer training that follows an exclusively psycho-pedagogical approach, with apparently no other perspective present. The contents collected in the syllabuses reflect that 8 of them underlie a marked traditional or categorical approach.

Reference to different groups of students or "types" of diversity

As pointed out in the theoretical introduction, the term "diversity" referring to students has traditionally been associated with students with special educational needs. Although, in the current discourse of inclusive education, a broader conception that encompasses other variables such as gender or migrant status, for which educational models such as coedu-

cation or interculturality have come to gain prominence in the paradigm of inclusion has been adopted.

In our review of the programmes of study we have analyzed what types of diversity are explicitly referred to, finding that 37 out of 56 subjects (66.1%) refer to one or more groups of students with specific needs of educational support, especially to students with needs derived from disability, learning difficulties or developmental disorders. In a much smaller number, 12 subjects (21.4%) mention foreign students or incorporate multiculturalism/interculturalism. At a smaller scale, 5 subjects (8.9%) deal with the issue of gender equality, 4 (7.1%) with socioeconomic inequalities and 3 (5.4%) with questions about affective-sexual diversity. Only in 1 subject have we found allusions to ethnic minorities, such as the Roma population. Finally, in 14 subjects (24.6%) no direct reference is made to any specific group or source of diversity.

Discussion

Our study aimed to explore the teacher training provided to students of Primary Education qualifications on issues related to inclusive education and attention to student diversity, both from a quantitative point of view (number of compulsory subjects in this regard) and qualitative (content and approach of the training), for which the current academic programs in the 39 public universities offering the degree have been reviewed and the syllabuses for the identified subjects have been analyzed. The results for this group of universities shows that training is notably insufficient: more than half have only one subject and in three of them no compulsory training is provided in this regard, which supports the discourses on the scant attention that the subject receives in preservice training (Cotán and Cantos, 2020; López-Torrijo and Mengual-Andrés, 2015) and would explain, in part, the feeling of lack of preparation manifested in various studies by both teachers in training (Cardona, 2009; Izuzquiza et al., 2015) and in-service teachers (MEFP, 2019; OECD, 2019). The scarce presence of specific training on IEAD compromises the preparation of future teachers. In this sense, we have been able to verify, for example, that around six out of ten students will obtain the degree without having received a training that allows them to become familiar with the current legislation on educational attention to diversity. In addition, it places our

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academic programs in a position that is certainly far from the EU's recommendations in this regard, which explicitly states that incorporating one or two subjects on inclusion is clearly insufficient (Agency, 2015).

Beyond the weight given to the IEAD, it is crucial to consider the approach that the training follows. As we have pointed out, the psycho-pedagogical approach, centered on knowledge and specific intervention on the students with specific needs of educational support, is predominant, with almost nine out of ten students receiving this training. On the other hand, it is striking that other approaches, such as curricular or school improvement, are present in the training of just over half of future teachers, which is a significant gap for the rest, who may join the profession without the necessary knowledge to provide adequate educational attention to the diversity of the student body. However, not all universities observe these training "gaps": in those that allocate more ECTS to IEAD, the training is more comprehensive, being able to identify a greater number of approaches, which, without a doubt, offers students the possibility of developing a wider range of competences for inclusion.

Finally, a good part of the subjects revolves around students with needs derived from disabilities or learning difficulties, while references to other types of diversities, such as socioeconomic, cultural, or affective-sexual, are anecdotal in the whole of the academic programs. Given the excessive focus of training on the students with specific needs of educational support in some cases and the "invisibility" of certain diversities in others, there is a risk that the message that the "diverse" are exclusively the students with disabilities or learning difficulties permeates the understanding of preservice teaching students, thus perpetuating a more traditional concept of diversity, which is far from the fundamental assumptions of inclusive education (UNESCO, 2000a).

In short, initial training on inclusive education received by teachers in various universities is insufficient and incomplete, not covering certain essential content for the proper professional activity.

Conclusions

Preservice teacher training cannot be kept out of the evolution that our educational system has to undergo in order to comply with the commitments made by Spain in recent years in pursuit of inclusive education

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(Convention on the Rights of Persons with Disabilities, Agenda 2030). Not surprisingly, the LOMLOE has assumed inclusive education as a fundamental principle and has determined that by 2025 teachers must be qualified to meet the goals of the 2030 Agenda. In this context, it should be guaranteed that any academic program leading to a teaching degree enable students to face the challenge of inclusive education, which would imply acting in two areas.

In the first place, it would be convenient for the regulations of these degrees to establish the obligation to include compulsory training in this regard in the academic programs, as recommended by the EU (Commission, 2017b). In this sense, a specific module of inclusive education could be defined, as is already the case in Order ECI / 3857/2007 with subjects related to other academic subjects (mathematics, natural sciences, physical education, etc.). Furthermore, it is important that the regulations emphasize the inclusive approach which training should follow, which would not exclude the possibility of incorporating specific content related to the students with specific needs of educational support. It is necessary to ensure that IEAD training is approached from multiple perspectives, following a comprehensive approach, and especially considering the development of competences to intervene in the classroom following a curricular approach, which would be more adequately aligned with the precepts of the LOMLOE, which establishes that attention to diversity should be focused according to the principles of Universal Design for Learning, a teaching model aimed at the design of a curriculum for all.

Second, it is necessary for universities to commit to the paradigm of inclusion, enabling its philosophy to permeate teacher training academic programs. The inclusive teacher profile prepared by the Agency (2012) can be an excellent framework to guide training in this regard and, given its European scope, incorporating it into our programs could give them added value, making them even more attractive and international in terms of mobility programs (e.g., Erasmus).

This commitment involves reserving an adequate amount of ECTS for content on inclusion. It is true that inclusive education should be present across the entire academic program, however, this cannot justify the non-incorporation of specific compulsory subjects in this regard, given that it is a field of knowledge with its own content that needs to be treated independently. Furthermore, as Izuzquiza et al. (2015, p. 200) state, a transversal approach *"has the risk of being inefficient - as is often the*

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case with what belongs to everyone but for what no one has, in the end, a specific responsibility".

Similarly, inclusive education training cannot be relegated to optional subjects either. Given that it is a fundamental aspect for the activity of the teaching profession, this training cannot depend on the will of the students. In addition, as we have already pointed out previously, on many occasions these subjects are not eligible for all students, especially for those who take on a specialization.

Ultimately, it is about acting with foresight to ensure that the general interest of shaping an academic program that responds to the social demands of the profession is prioritized over potential particular interests, as Imbernón suggests avoiding:

> *It cannot be that every time the teaching curriculum is revised, it becomes, in many universities, a burden (or continuation) of the worst part of the academic culture […] And it keeps repeating itself, more of the same, because it is difficult to discard certain subjects given that sometimes the "what about mine?" predominates, having been taught for years though no longer valid* (2017, p. 64).

Limitations

Our study is not without its limitations. In the first place, this work does not reflect the reality surrounding the training that students receive for teacher qualifications in Primary Education on inclusive education, but rather the results are based on the information that appears in the syllabuses. Thus, it could happen that there are teachers who introduce content in this regard in their subjects, even if they deal with other topics. Second, we have not reviewed the contents of all the compulsory subjects, but only those whose names indicated that they dealt specifically with IEAD. We are aware that these topics are occasionally treated briefly in core subjects such as General Didactics or Educational and Development Psychology (in its various names). However, the transversal or superficial treatment that can be done from these subjects (often a single topic or block of contents) does not seem sufficient to guarantee the adequate preparedness of future teachers. For this reason, our study focuses on compulsory subjects that are specifically aimed at training in inclusive education.

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Annex I.
Summary table of compulsory subjects on IEAD

	UNIVERSITY[1]	STUDENTS[2]		SUBJECT	AREA	FRAME		APPROACH[3]				TYPE OF DIVERSITY					
		N	%			Conceptual	Regulatory	Curricular	School improv.	Psychopedagogic	Base don values	SEN[5]	Gender issues	Affective Sexual	Foreign / Cultural	Socioeconomic	Other
3 COMPULSORY SUBJECTS	02.UNIZAR	2,120	3.71	Attention to diversity	DOE	•	•	•	•								
				Social and intercultural education	THE						•				•		
				Evolutionary processes and diversity	PEE					T		•					
	04.UIB	1,033	1.81	Specific learning difficulties	DOE		•			P		•					
				Inclusive Education	DOE	•		•	•								
				Psychoed. interv. in language difficult. in…	PEE					T		•					
	10.UJI	920	1.61	Learning difficulties in primary education	PEE					T		•					
				Education for diversity	DOE	•	•	•	•			•	•	•	•		
				Developmental disorders	PEE					T		•					
	17.UNIRIOJA	588	1.03	Inclusive educ. and response to divers.: 6-12	DOE	•	•	•	•								
				Education for coexistence	DOE THE				•		•		•	•	•		
				Develop. disorders & learning difficulties	PEE					T		•			•		
2 COMPULSORY SUBJECTS	01.UGR	3,711	6.49	Attention to diversity in primary education	DOE PEE	•	•	•	•	P		•					
				Learning difficulties	PEE					T		•					
	01.US	3,104	5.43	Develop. and learning difficulties	PEE PETRA					T		•					
				Research meth. & attent. to divers. (½ subj.)	DOE	•			•								
	01.UMA	1,905	3.33	Towards inclusive schools: Models & practices	DOE	•		•	•								
				Develop. disorders & learning difficulties	PEE					T		•					
	01.UCO	1,460	2.55	Diversity, coexistence and Inclusive Educ.	DOE THE				•		•						
				Psych. of school coexistence in Prim. School	PEE				•								
	01.UHU	1,154	2.02	Attention to diversity and tutoring (½ subj.)	DOE	•	•	•	•								
				Psychological bases of special education	PEE	•				T		•					
	03.UNIOVI	1,224	2.14	Psychological bases of attention to diversity	PEE					T		•				•	
				Education in values	THE						•		•		•		

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2 COMPULSORY SUBJECTS	07.UVA	2,031	3.55	Education for peace and equality	DOE PEE				•		•		•	•	•		
				Psychoped. foundations of atten. to diversity	DOE PEE	•	•	•		T		•					
	07.USAL	1,205	2.11	Attention to diversity	DOE	•	•	•	•	P							
				Psychology of learning difficulties	PEE					T		•					
	07.UNILEON	538	0.94	Education in values	Hª PENS						•				•		
				Childhood disorders	PETRA					T		•					
	13.UAM	1,221	2.14	Psychoped. bases for educational inclusion	Various	•	•	•	•	P		•					
				Educating for equality and citizenship	Various				•		•						
	15.UNAVA-RRA	748	1.31	Diversity and psychopedagogical response	DOE PEE	•				T / P		•					
				Society, family & inclusive school (1 block)	DOE	•			•								
	16.UPV	2,267	3.97	Bases of inclusive school	DOE	•	•	•	•								
				Developmental and learning difficulties	PEE					T		•					

Notes: (1) The digit inform about the CCAA (region) to which each university belongs (2) Source: Ministry of Universities (see footnote 3). (3) Psycho-pedagogical approach: T (Traditional) / P (Polyvalent). (4) Roma population. (5) SESN: Specific Educational Support Needs.

	UNIVERSITY (1)	STUDENTS (2)		SUBJECT	AREA	FRAME		APPROACH (3)				TYPE OF DIVERSITY					
		N	%			Conceptual	Regulatory	Curricular	School improv.	Psychopedagogic	Base don values	SESN (5)	Gender issues	Affective Sexual	Foreign / Cultural	Socioeconomic	Other
I COMPULSORY SUBJECT	01.UJAEN	1,605	2.81	Psychopedagog. bases of Special Education	DOE PEE	•		•	•	T / P		•					
	01.UCA	1,192	2.09	Educational treatment of learning differenc.	DOE PEE	•		•		P		•					
	01.UAL	923	1.61	Specific educational support needs	PEE	•				T		•			•	•	
	05.ULPGC	1,667	2.92	Difficulties in the learning process	PEE	•	•	•		P		•					
	06.UNICAN	867	1.52	Psychoped. foundations of atten. to diversity	DOE PEE	•		•									
	07.UBU	567	0.99	Psychoped. foundations of atten. to diversity	PEE					P		•					
	08.UCLM	2,627	4.60	Learning and development disorders	PEE					T		•			•		
	09.UB	2,116	3.70	Theory and practice of the inclusive school	DOE	•	•	•	•	P		•	•		•		
	09.UAB	1,054	1.84	Differences and inclusion	PEE	•	•	•	•	P		•				•	
	09.UDL	772	1.35	Attention to diversity	PEE					P		•			•		
	09.URV	682	1.19	Learning difficulties & develop. disorders	PEE	•				T		•					
	10.UV	2,425	4.24	Special educational needs	PEE	•				T		•					
	10.UA	1,681	2.94	Learning difficulties & develop. disorders	PEE					T		•					
	11.UNEX	2,050	3.59	Psychoed. attent. to divers & school coexist.	PEE PETRA	•				T		•					
	12.USC	1,005	1.76	Learning difficulties & develop. disorders	PEE					T		•					
	12.UVIGO	983	1.72	Prevent. and treat. of LD & develop. disord.	PEE					T		•					
	12.UDC	630	1.10	Inclusive and multicultural education	DOE	•		•				•			•		(4)
	13.URJC	1,546	2.70	Attent. to divers. & educational inclusion…	MIDE	•		•									
	13.UAH	1,203	2.10	Psychoped. foundations of atten. to diversity	PEE	•	•	•	•	P		•				•	
	14.UM	2,284	4.00	School organiz. & student divers. (½ subj.)	DOE	•	•	•		P		•					
0 CS	05.ULL	939	1.64	-	-												
	09.UDG	644	1.13	-	-												
	13.UCM	2,463	4.31	-	-												

Notes: (1) The digit inform about the CCAA (region) to which each university belongs (2) Source: Ministry of Universities (see footnote 3). (3) Psycho-pedagogical approach: T (Traditional) / P (Polyvalent). (4) Roma population. (5) SESN: Specific Educational Support Needs.

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Annex II.
List of subjects grouped by main theme according to their name

TOPIC	SUBJECT & UNIVERSITY
Inclusion / inclusive **N=8**	• Inclusive Education - 04.1.UIB • Inclusive and multicultural education - 12.3.UDC • Inclusive education and response to diversity: age 6-12 - 17.1.UNIRIOJA • Bases of inclusive school - 16.1.UPV • Towards inclusive schools: Models & practices - 01.3.UMA • Society, family & inclusive school - 15.1.UNAVARRA • Theory and practice of the inclusive school - 09.1.UB • Differences and inclusion - 09.2.UAB
Foundations / bases **N=11**	• Psycho-pedagogical foundations of attention to diversity - 06.1.UNICAN • Psycho-pedagogical foundations of attention to diversity - 07.3.UBU • Psycho-pedagogical foundations of attention to diversity - 07.1.UVA • Psychological bases of attention to diversity - 03.1.UNIOVI • Psycho-pedagogical foundations of attention to diversity - 13.4.UAH • Educational treatment of learning differences - 01.6.UCA • Psycho-pedagogical bases for educational inclusion - 13.3.UAM • Psychological bases of special education - 01.7.UHU • Psycho-pedagogical bases of Special Education - 01.4.UJAEN • Special educational needs - 10.1.UV • Specific educational support needs - 01.8.UAL
Values **N=7**	• Education in values - 03.1.UNIOVI • Education in values - 07.4.UNILEON • Education for coexistence - 17.1.UNIRIOJA • Education for peace and equality - 07.1.UVA • Social and intercultural education - 02.1.UNIZAR • Educating for equality and citizenship - 13.3.UAM • Psychology of school coexistence in Primary School - 01.5.UCO
Diversity **N=13**	• Attention to diversity – 02.1.UNIZAR • Attention to diversity - 07.2.USAL • Attention to diversity - 09.3.UDL • Attention to diversity & educational inclusion: Didactic implications - 13.2.URJC • Attention to diversity in primary education - 01.1.UGR • Attention to diversity and tutoring - 01.7.UHU • Psycho-educational. attention to diversity & school coexistence - 11.1.UNEX • Diversity and psycho-pedagogical response - 15.1.UNAVARRA • Diversity, coexistence and Inclusive Education - 01.5.UCO • Education for diversity - 10.3.UJI • Research methods in education & attention to diversity - 01.2.US • School organization & student diversity - 14.1.UM • Evolutionary processes and diversity - 02.1.UNIZAR

Disorders / difficulties **N=17**	• Learning difficulties - 01.1.UGR • Learning difficulties & developmental disorders - 09.5URV • Learning difficulties & developmental disorders - 10.2.UA • Learning difficulties & developmental disorders - 12.1.USC • Learning difficulties in primary education - 10.3.UJI • Developmental and learning difficulties - 01.2.US • Developmental and learning difficulties - 16.1.UPV • Difficulties in the learning process - 05.1.ULPGC • Specific learning difficulties - 04.1.UIB • Psychoeducational intervention in language difficulties in the school context - 04.1.UIB • Prevention and treatment of learning difficulties & developmental disorders - 12.2.UVIGO • Psychology of learning difficulties - 07.2.USAL • Developmental disorders - 10.3.UJI • Childhood disorders - 07.4.UNILEON • Developmental disorders & learning difficulties - 17.1.UNIRIOJA • Developmental disorders & learning difficulties - 01.3.UMA • Learning and development disorders - 08.1.UCLM

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STEM Education and Primary Teacher Training in Spain[1]

Educación STEM y formación del profesorado de Primaria en España

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Abstract

STEM education has been characterised by a number of models since it was initially introduced. That diversity notwithstanding, a literature review conducted on the occasion of this study identified three characteristics consistently found in all: problem solving, application to real-life situations, and interdisciplinarity. This study explored the possibility of implementing STEM education that adheres to the primary education pre-service training curriculum in Spain. Pursuit of that objective entailed ascertaining the presence of STEM characteristics in the syllabi for 236 core or requisite subjects dealing with STEM areas (science, technology, enginerering, mathematics) delivered in Spanish public universities. The findings showed that the guides for subjects in the mathematics and science areas in place in most universities envisage all three characteristics, with problem solving the one most frequently mentioned in the four curricular elements addressed in the guides (learning expectation, content, methodology and assessment). The conclusion drawn is that STEM education could be adopted on the multidisciplinary level, in which each subject would have its own objectives but with tasks introduced under a common theme.

Keywords: STEM, primary teacher training, syllabus analysis, university education, educational innovation

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Resumen

Desde sus inicios, la educación STEM ha sido caracterizada a través de distintos modelos. A pesar de esta diversidad, encontramos tres características comunes en la literatura especializada —resolución de problemas, aplicación de contenidos en situaciones reales e interdisciplinariedad—. En este trabajo indagamos hasta qué punto es posible implementar una Educación STEM que se ciña al plan de formación inicial de maestros de Educación Primaria vigente en España. Para ello, hemos realizado un análisis de documentos, en base a las tres características propias de la educación STEM, de las 236 guías docentes de las asignaturas de carácter básico u obligatorio relacionadas con las áreas STEM de las universidades públicas españolas. Los resultados muestran que la mayoría de las universidades contemplan en sus guías docentes del área de Matemáticas y Ciencias Experimentales estas tres características, siendo la resolución de problemas la que mayor presencia tiene en todos los niveles curriculares de las guías (expectativas de aprendizaje, contenidos, metodología y evaluación). Concluimos que, la inclusión de la educación STEM podría ser posible a través de una integración a nivel multidisciplinar, donde cada asignatura tiene sus propios objetivos pero se introducen tareas a través de un tema común.

Palabras clave: STEM, formación de docentes de primaria, análisis de documentos curriculares, Educación Universitaria, innovación educativa

Introduction

The nineteen nineties saw the advent in the United States of a movement, a legacy of the educational reforms prompted by the Sputnik crisis, that pursues a holistic approach to science, technology, engineering, and mathematics (STEM). Beyond the political and economic situation that induced it, the movement soon spilled over into education in response to the social need to prepare citizens for the new challenges arising with the twenty-first century. The know-how, skill and abilities associated with a crosswise command of STEM disciplines are sought in nearly all industries and have become part of people's daily lives (Bergsten & Frejd, 2019; Mpofu, 2020). That educational movement evolved into a separate entity: STEM education, which aims to help students prepare for those changes and respond to the growing demand for STEM area expertise.

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STEM education, understood as an educational approach that fosters the integration of scientific, technological, engineering, and mathematics contents to solve real-world problems, is deemed a complex process (Martín-Páez, Aguilera, Perales-Palacios, & Vílchez-González, 2019). Researcher and educator concern to improve that approach has grown in step with the demand for STEM skills (English, 2016). In countries such as the United States and Singapore the idea of instituting STEM education has been envisaged for decades. Very few teachers know how to practise it in the classroom, however (Kelley & Knowles, 2016), particularly when they themselves entertain a narrow idea of what STEM education entails (Dare, Ring-Whalen, & Roehrig, 2019). These new instructional challenges call for pre-service training tailored to twenty-first century demands (Hernández, 2011).

Teacher training for STEM education is a fairly new area of research. A few studies have been conducted to analyse the efficacy of proposals for science (e.g., Alan, Zengin, & Kececi, 2019), secondary mathematics (e.g., Bergsten & Frejd, 2019) and primary (e.g., Bergsten & Frejd, 2019) teacher training curricula. In Alan et al.'s (2019) quasi-experimental study, students who attended science class for which integrated STEM proposals had been designed improved their problem-solving skills substantially. Bergsten and Frejd (2019) observed that in a brief training course on STEM education, the future mathematics teachers participating proved able to integrate STEM discipline contents with richly designed proposals in which modelling and inquired-based learning were essential elements. Most of their proposals included the use of information and communication technologies (ICT) as tools for developing twenty-first century skills. A number also envisaged creativity, problem solving and decision making as skills related to a way of thinking. In their research on primary school teachers, Bartels et al. (2019) reported that most of the proposals designed were contextualised around the science classes for which they were asked to plan, design, build, test, and collect data and included the integration of at least two disciplines, although most included three or four. At the same time, other more limited visions of what is entailed in integrated technology were also observed.

The foregoing review revealed that although research has identified the possibility of including STEM education in training curricula and attested to educators' ability to draft an educational design for STEM disciplines, such proposed designs are questionable because they do

not always cover all four areas or they focus on one only, broaching the others as mere context or tools to perform the task (Bartels et al., 2019; Bergsten & Frejd, 2019). Their specificity stands as evidence of the need to revise teacher training globally (Bogdan & García-Carmona, 2021). Research along those lines also highlights the need for studies on improving teacher training in respects associated with STEM education (Kelley & Knowles, 2016), in primary school pre-service training in particular, where future teachers face substantial challenges in and hold unfavourable attitudes toward the areas of science and mathematics (Casis, Rico, & Castro, 2017).

Under those circumstances, the question that arises is whether it is possible to institute STEM education in Spain's existing pre-service training for primary school teachers. The study discussed below was not broached from the perspective of assessment, for the implementation of STEM education is not one of the aims of the training programme. The focus was on STEM education rather than more recent approaches such as STEAM because it has been more fully developed in theory and in practice (García-Carmona, 2020). At the same time, whilst one of the primary arguments to justify such more recent proposals is their furtherance of creativity and innovation, both pursuits are inherent in scientific-technological disciplines (Aguilera et al., 2021; García-Carmona, 2020).

Characterising STEM education

From the outset, the literature has interpreted STEM education from different perspectives. Some authors describe it as problem solving based on scientific and mathematical ideas and procedures that integrate strategies applied in enginerering and the use of technology (Shaughnessy, 2013). Other experts note that it aims to view all STEM disciplines as a single coherent entity taught through the integrated and coordinated solving of real-world problems (Aguilera et al., 2021). In light of such diversity experts such as Bybee (2013), Dare (2019), Mpofu (2020), or Martín-Páez et al. (2019) categorise the several ways STEM education has been broached in research and the literature. All four authors identified the following approaches.

The first advocates for teaching the disciplines separately, either as different subjects or as different units in the same subject (Bybee, 2013). This traditional approach, which addresses the content of each area individually, furthers instruction disconnected from real life and may preclude an integrated focus (Martín-Páez et al., 2019; Mpofu, 2020). It also necessitates the presence of all four areas in school curricula, whereas enginerering is excluded from Primary Education.

The second model combines two or three disciplines but fails to integrate all four. The areas integrated may be deemed a new core discipline dealt with in depth and in connection with other STEM areas. Some authors (Dare et al., 2019; Martín-Páez et al., 2019) nonetheless believe that this risks excluding some of the disciplines or emphasising or envisioning them as mere tools or context.

In the third approach some one of the STEM disciplines, normally enginerering or technology, is integrated into the instruction of the other three. Bybee (2013) contends that such a perspective constitutes a first step toward integration.

A final integrated model includes the knowledge and skills characteristic of all the areas in a single instructive experience. The inference is that the teachers entrusted with delivery must have a command of all the areas to enable students to acquire competencies with which to understand and confront real-world problems. This model embodies the interdisciplinary significance of STEM education, combining the content of all in the same unit of a given single subject. It also eludes the drawbacks of teaching the areas separately by mirroring the interdisciplinary nature of real-life problems while enhancing students' learning experience (Martín-Páez et al., 2019; Mpofu, 2020).

In this study one of the essential characteristics for deeming STEM education to be in place was the integration of the four areas, for otherwise it would be scantly distinguishable from earlier educational proposals such as Science, Technology, and Society (STS). Inasmuch as such integration is among the major challenges posed by STEM education (Bogdan & García-Carmona, 2021; Dare et al., 2019), some authors define several levels (Aguilera et al., 2021; English, 2016). On the first, the disciplinary level, content is learned separately for each discipline. On the second or multidisciplinary level, each discipline has its own aims, although they are introduced via the same task under a common topic and the interarea connections are explicitly identified. In

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some cases, the disciplines may be unevenly weighted. On the third or interdisciplinary level, the aims involve several disciplines. The highest or transdisciplinary level involves aims pertaining to all disciplines and is geared to solving real-world problems.

Although significant progress has been made to date, no consensus has been reached on a common characterisation of or model for STEM education nor how to put it in practice (Bogdan & García-Carmona, 2021). Nonetheless, the present review, in line with the criticism levelled at the models, revealed three basic characteristics that must be present in STEM education, referred to hereafter as 'STEM characteristics': (i) inclusion of a real-world problem; (ii) interdisciplinarity or interconnection among the STEM areas; and (iii) development of problem-solving skills (Aguilera et al., 2021; Bybee, 2013; Fomunyam, 2020; Kennedy & Odell, 2014)

Official documents on primary school teacher pre-service training in Spain

Primary school teacher pe-service training has evolved over the last few decades due to the introduction of the Bologna Process and the need to adapt university courses to European Higher Education Area standards. That has entailed substantial change, such as lengthening course time by a full year and adopting a skills-based curricular approach. The new curricular design is laid down in a number of official nation, institution and department scale documents, drafted to different levels of detail (Rico, Gómez, & Cañadas, 2014).

The nationwide guidelines establish the number of university credits required and their distribution across different training units: academic (learning and personality development; educational processes and contexts; society, family, and classroom), disciplinary (teaching and learning experimental science; social science; mathematics; languages; music, plastic and visual arts; physical education), and practical (classroom practice and bachelor's dissertation). These guidelines likewise describe the skills that must be acquired by future teachers, as specified by the Ministry of Education and Science (MEC).

On the institutional scale, universities particularise the nationwide guidelines in the course memorandum, which includes curricular design and structure and the descriptors and credits assigned to each subject.

Universities are free to design their own curricula, subject to compliance with nationwide stipulations (Rico et al., 2014).

On the final and most specific or individual scale, the respective university departments are entrusted with fleshing out the subjects included in the national and institutional documents. Known as syllabi, these official documents serve as a reference for professors delivering the subject and their students, for they contain general information on the subject (number of ECTS credits, nature, semester, department, professors in charge, bibliography). They also address essential planning details, which may be arranged around the four basic curricular elements proposed by Tyler (1986): learning expectations, content, methodology and assessment (Rico, 2013).

This study focuses on the most detailed or department scale documents, the syllabi, to answer the question: can STEM education be introduced in Spain's existing primary education pre-service training curriculum? The two objectives posed to respond to that question were:

- To describe the presence of STEM areas in the curriculum for the official university degree that qualifies students to practise as primary education teachers in Spain.
- To identify the presence of STEM education characteristics (problem solving, real-world situations and interdisciplinarity) in Spanish public universities' syllabi for STEM area-related subjects delivered in connection with the aforementioned degree.

Method

The document analysis (Bowen, 2009) covered the 236 syllabi for STEM area-related subjects defined by Spanish public universities as core or requisite subjects[2] to earn official university qualification to practise as primary education teacher ('Grado en Maestro de Educación Primaria' or 'Grado de Educación primaria' [Primary Teacher or Primary Education Graduate]). All the syllabi analysed were in effect in academic year 2020/2021. Of the 236 core or requisite subjects delivered by the 39

(2) Subjects that all students must pass to earn their degree.

Spanish public universities offering the degree, 113 addressed Didactic of Mathematics, 101 Didactic of Experimental Science, and 22 ICTs[3].

Categories

The categories applied in the present analysis were built around two dimensions: STEM characteristics and curricular elements. STEM characteristics were drawn from the features described in STEM education definitions and models:

- Problem solving. A problem is understood to be a task or challenge and that some investigation to determine the procedure applied to determine the solution, which is not known at the outset. This category therefore involves developing problem-solving skills rather than engaging in theoretical considerations associated with the idea such as identification of or distinctions between types of problems (arithmetic, educational, dispute settlement…).
- Application of real-life situations or inclusion of a real-world context. Allusions to the application of content learnt to daily or real-life situations. This category does not cover the content itself such as probability or magnitudes in mathematics, for instance, or the human body or the earth in experimental science.
- Interdisciplinarity. References to one or several STEM areas other than the one associated with the syllabus. This category had in tun to be subdivided into two subcategories due to the large number of references to ICTs: ICT usage (mentions of this matter in a non-ICT subject syllabus) and other STEM areas (mentions of a STEM area other than the area at hand and of ICTs, or explicit reference to interdisciplinarity).

The second dimension, curricular elements, refers to syllabus structure and includes the categories deemed essential in the curriculum and classroom planning (Rico, 2013; Tyler, 1986):

(3) The intention here is not to equate ICTs with technology, but rather identify them as part of that category. They were consequently deemed to form part of the ICT rather than the technology area.

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- Learning expectations. Targets that establish learning priorities, defined in syllabi in terms of skills, learning objectives or learning outcomes.
- Content. References that organise knowledge in terms of ideas, procedures or attitudes. In syllabi they appear as subject content or topics.
- Methodology. Strategies, actions, teaching techniques, tasks or necessary materials that together define how the subject will be delivered.
- Assessment. Guidelines, systems or techniques whose purpose is to identify what students have learned.

The foregoing categories, drawn deductively from the literature, were submitted to experts in the field for their evaluation, and more specifically to three area researchers with ample experience in the area.

Data analysis

The data were analysed by two stages. In the first, references in the documents were coded in keeping with the categories defined with MAXQDA software. A deductive process was deployed because the categories to be coded were formulated on theoretical grounds (Fraenkel, Wallen, & Hyun, 2011). For instance, the skill defined as 'Posing and solving daily life problems' was coded under all three categories: learning expectations, problem solving and application of real-life situations.

Five per cent of the syllabi was first coded separately by the two researchers. Table I gives the number of analytical units consistently coded with the same code (a), along with the number coded by only one of the two researchers (b and c). The likelihood of coding an analytical unit with a random code is minimal in this type of documents, since all pieces of information not chosen can in fact be deemed to have been agreed on. MAXQDA calculated a kappa index of 0.944 with 95% agreement between coders.

TABLE I. Inter-coder agreement

		Coder 1		
		0	1	
Coder 2	0	a = 231	b = 3	234
	1	c = 7	0	7
		238	3	241

Source: author formulation

The non-agreements were reviewed and a consensus was reached for coding the remaining documents. Given the optimal consistency attained, the remaining documents were coded by only one of the researchers.

In the second stage, undertaken after all the data were coded, the frequency tables and statistical descriptors for the categories were calculated by STEM area. That exercise was followed by the formulation of concurrence tables and relationship matrices between STEM characteristics and curricular elements. An inter-code relationship matrix is a visual representation of the intersections of two codes in any given mention (Graph I). The matrix gives the number of mentions where any two specific codes were assigned for all possible combinations of pairs of codes. The size of the symbols at the points where the two members of each pair intersect is proportional to the number of mentions coded with that pair. A cluster analysis was then conducted, establishing the STEM characteristics as the criteria for defining document clusters. More specifically, simple matching was used as similarity measure. That method uses the frequency of code occurrence in a document (which is only included in the calculation if it has been assigned a code) and defines inter-attribute similarity as the number of matches divided by the total number of attributes.

Results

The results are described in the three subsections that follow. The first discusses the overall presence of STEM areas in the course, in reply to the first research objective. The second and third subsections address the

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second research objective. The second focuses on the STEM characteristics found in STEM area-related subjects and curricular elements, whilst the cluster analysis findings are set out and cluster characteristics are described in the third.

Presence of STEM areas in primary education pre-service training

Further to the analysis of the 2020/2021 syllabi, only two of the four STEM areas were present as explicit subjects in the official curriculum for a degree in primary education. The review also showed mathematics and experimental science to clearly prevail over ICT in terms of the total number of requisite subjects defined in all 39 university courses, given in Table II along with the descriptive statistics for the number of subjects and credits per university assigned to each area.

TABLE II. Statistical descriptors for number of subjects and credits assigned to STEM areas in the curricula for primary education courses delivered by Spanish public universities

	No. of subjects						No. of credits					
	N	**Min**	**Max**	**Me**		σ	**N**	**Min**	**Max**	**Me**		σ
Mathematics	113	2	4	3	2.90	0.502	711	12	24	18	18.154	2.368
Experimental Science	102	2	5	2	2.56	0.754	598	12	24	15	15.679	3.617
ICT	22	0	2	1	0.54	4.582	120	0	12	3	3.077	6.235

Note: N= total; Min=minimum; Max=maximum; Me= median; =mean; σ=standard deviation
Source: author formulation

In the academic year reviewed, mathematics, the most predominant area, accounted for a total of 113 core or requisite subjects and a median of 3, ranging from 2 in some institutions to 4 in others. A median of 18 ECTS was assigned to each subject, with a minimum of 12 and a maximum of 24. On the whole, the courses were designed to further future teachers' acquisition of two types of competence: basic mathematical skills such as problem solving or the organisation and interpretation of information; and skills related to mathematics teaching and learning such as 'familiarity with the mathematics curriculum' or

'conveying and assessing curricular content with suitable educational resources and fostering students' acquisition of skills' (MEC, 2007, p. 53750). The subject matter was observed to be organised in one of two ways: (i) via subjects focusing primarily on understanding mathematics and others dealing separately with content delivery; or (ii) combining the two types of skills in all subjects, each dealing with a given area of mathematics (Table III).

TABLE III. Examples of the distribution of credits for requisite subjects in the areas of mathematics and experimental science

	Mathematics	**Experimental Science**
University of Las Palmas de Gran Canaria	Mathematics and Didactics of Mathematics I (6 ECTS) [numbers and algebra]	Didactics of Natural science, Health, Biodiversity, and Environment (6 ECTS)
	Mathematics and Didactics of Mathematics II (7 ECTS) [measurement and geometry]	Didactics of Physics, Chemistry, Geology, and Environmental (7.5 ECTS).
	Mathematics and Didactics of Mathematics III (6 ECTS) [statistics and probability]	
University of Granada	Basic Mathematics for Primary Education (9 ECTS)	Didactics of Experimental Science I (9 ECTS) [physics, chemistry, and geology]
	Teaching and Learning Mathematics in Primary School (6 ECTS)	Didactics of Experimental Science II (6 ECTS) [biology]
	Curricular Design and Development for Teaching Primary Education Mathematics (7 ECTS)	

Source: author formulation

A total of 102 experimental science requisite subjects were identified, with a median of 2 subjects and 15 ECTS. However, data ranged from 2 to 5 subjects, which correspond to 12-24 ECTS. As with mathematics, training in this area was observed to be geared to understanding scientific content such as 'the basic principles and fundamental laws of experimental science' (MEC, 2007, p. 53749) and to acquiring the ability to 'convey and assess curricular content with suitable teaching resources

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and further students' acquisition of basic competencies (MEC, 2007, p. 53749). The syllabi for academic year 2020/2021 fostered both types of knowledge, organised along the lines of the discipline involved (physics, chemistry, biology, geology), although some subjects focused on an understanding of scientific content only.

No specific subjects were identified in the technology area and only 20 universities established as requisites subjects dealing specifically with ICTs. That notwithstanding, further to the national guidelines, one of the 12 general competencies students were to acquire to earn their degree was 'an understanding and classroom application of information and communication technologies' (MEC, 2007, p. 53749). The syllabi for the mathematics and experimental science areas therefore frequently carried references to working with ICTs or software. Explicit references to technology were also observed (such as: 'energy in the social and technological surrounds' and 'science and technological development; technology and social development') in some of the syllabi for experimental science subjects, in particular those focusing on physics.

Not a single subject dealing exclusively with enginerering was identified, nor was any explicit reference to that area observed in any of the syllabi reviewed.

Presence of STEM characteristics in syllabi

Problem solving was the STEM characteristic most frequently found in the syllabi (Table IV).

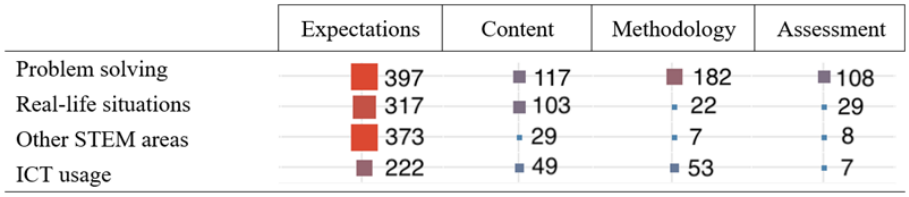
TABLE IV. Statistical descriptors for STEM statistics

	Mean	Standard deviation	Median	Minimum	Maximum
Problem solving	3.43	1.03	3	0	14
Real-life situations	2.02	0.94	1	0	10
Other STEM areas	1.82	0.81	2	0	9
ICT usage	1.45	1.25	1	0	14

Source: author formulation

Problem solving was also the STEM characteristic observed to prevail in all the curricular elements (Graph I), whilst application to real-life situations was found primarily in the first two elements (learning expectations and content). The element with highest frequency of references to interdisciplinarity, in turn, was learning expectations. As a rule, in the syllabi analysed, content, methodology, and assessment focused on subject organisational details, which would explain the low frequency of STEM characteristics under those headings.

GRAPH I. STEM characteristic / curricular element matrix



Source: author formulation

Problem solving

Problem solving was the characteristic with greatest presence in the syllabi analysed (Table IV), identified up to 14 times in one. That finding is reasonable, given the existence of mathematics subjects specifically devoted to such skills, as in the subject 'Problem solving and mathematical connections' delivered at the University of Almería. Although references were found in all areas, problem solving was significantly greater in mathematics than in the other two (Table V).

TABLE V. Presence of problem solving in curricular elements by STEM area-related subject

	Expecta-tions	Content	Methodology	Assessment	Total
Mathematics (N=113)	227	93	116	79	515
Experimental Science (N=102)	154	21	62	25	262
ICTs (N=22)	12	2	4	4	22

Source: author formulation

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In line with national guidelines (MEC, 2007), which in 2020/2021 stipulated the general competency for the science area to be 'posing and solving science-related problems in daily life' (p. 53749) and for mathematics to be 'posing and solving problems associated with daily life' (p. 53759), those skills were included in most of the syllabi as learning expectations. In some cases, however, they were particularised as part of a given discipline in one of the two areas (numbers, geometry; biology, environmental education…) or no reference was made to daily life.

Problem solving was also found to constitute part of the content or as a topic. Under ICTs, the University of the Basque Country's subject 'Information and communication technologies in primary education' contained a chapter on 'Solving conceptual problems with digital media', although tat skill was more frequently observed in mathematics syllabi (Table V).

Methodology included practical lessons devoted to problem solving to illustrate the academic theory involved. In some cases, reference was observed to PBL (problem-based learning) in conjunction with other methodologies.

Under assessment, problem solving was most often included in exams calling for students to solve problems, such as in the stipulation that 'tests will contain questions on academic knowledge as well as problems similar to the ones addressed in the classroom', set out in the University of León's subject 'Experimental science teaching and learning I'. Problem solving was normally deemed to be one of the classroom activities performed throughout the school year liable to assessment.

Real-life situations

Application to real-life situations was not very heavily present in the 2020/2021 syllabi, with over half containing only one or no references (Table IV). As the matrix in Graph I shows, this characteristic was found nearly exclusively under learning expectations (in connection with posing and solving problems associated with daily life) and content. As explained earlier, content was deemed to embrace real-life situations only when reference was made to its application to daily life, with chapters such as 'Chemistry and daily life' in the University of Seville's subject 'Fundamentals of the science of matter' or 'Uses and contexts of natural

numbers' in the University of Cordoba's subject 'Mathematics'. This characteristic was essentially absent from methodology and assessment in the syllabi analysed.

Its weight by area (Table VI) was found to be similar in mathematics and experimental science, although slightly greater in the latter, whereas mention was practically notional only in ICT subjects.

TABLE VI. Presence of real-life situations in curricular elements by area

	Expectations	Content	Methodology	Assessment	Total
Mathematics (N=113)	147	53	9	12	221
Experimental Science (N=102)	166	48	12	16	242
ICTs (N=22)	4	2	1	1	10

Source: author formulation

Interdisciplinarity

Means of two references to the subcategory other STEM areas and of 1.45 to ICT usage were observed in the syllabi reviewed (Table IV). Nearly all the references to the former subcategory were found under learning expectations (Graph I), given the definition in the national guidelines of the skills: 'esteeming the relationship between mathematics and science as one of the mainstays of scientific thinking' (p. 53750) in mathematics; and 'recognising the interconnections among science, society and technological development and the respective civilian behaviours in pursuit of a sustainable future' (p. 53749) in experimental science as course aims. Unsurprisingly, then, references to this characteristic in the syllabi were found most frequently in connection with learning expectations. One notable finding was the inclusion of the item 'STEAM in experimental science education, fundamentals and classroom experiences' under the topic 'Science, technology and society' in Rovira i Virgili University's subject 'Teaching and learning experimental science'.

References to the second subcategory, ICT usage, in the syllabi analysed stressed the importance of future teachers' user-level command

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of such technologies as well as of their acquaintance with specific ICT resources for teaching mathematics and Science and their ability to use and include them in teaching proposals. In contrast to the subcategory on other STEM areas, here the curricular elements content and methodology accounted for the greater number of mentions to ICT usage. Examples include the chapter on 'ICTs in mathematics teaching-learning' in the University of La Laguna's subject 'Teaching numeracy and probability in statistics' or under methodology, the recommendation to 'furthering the use of ICTs' in the University of Valladolid's subject 'Teaching the experimental science curriculum'.

The inter-area differences observed are set out in Table VII. References to ICT usage were more frequent in the mathematics than in experimental science syllabi, whereas the relationship to other STEM areas carried greater weight in Science. The ICT syllabi, in turn, carried practically no reference to interdisciplinarity. That notwithstanding, the difference between areas was narrower in that subcategory.

TABLE VII. Presence of interdisciplinarity and use of ICTs in curricular elements by area

		Expectations	Content	Methodology	Assessment	Total
Other STEM areas	**Mathematics (N=113)**	175	5	4	2	186
	Experimental Science (N=102)	192	24	3	6	224
	ICTs (N=22)	6	0	0	1	7
ICT usage	**Mathematics (N=113)**	133	36	32	5	207
	Experimental Science (N=102)	89	13	21	1	124
	ICTs (N=22)	-	-	-	-	-

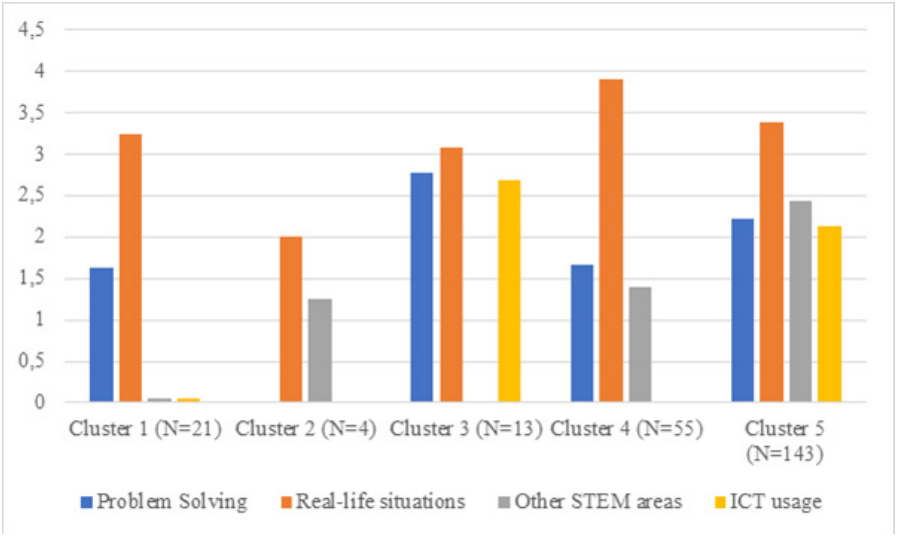
Source: author formulation

Cluster analysis of syllabi by STEM characteristic

As discussed in the preceding section, globally speaking the syllabi reviewed contained references to all three STEM characteristics (problem

solving, real-life situations, interdisciplinarity (sub-divided into ICT usage and relations with other STEM areas). Not all the syllabi mentioned all three categories, however. Cluster analysis was conducted to identify similarities among the syllabi in terms of the STEM characteristics present. Inasmuch as the use of MAXQDA software entails pre-defining the clustering method and number of clusters because the tool does not deploy hierarchical methods, the analysis involved was conducted by adding a new cluster until the next one generated was the result of the division of a minority cluster. That procedure ultimately yielded the five clusters depicted in Graph II, which shows the number of syllabi in each cluster and the mean number of references to each STEM characteristic.

GRAPH II. Syllabi clustered by STEM characteristic



Source: author formulation

The 21 syllabi in the first cluster contained references primarily to problem solving and application to real-life situations. Cluster 2, the smallest of the five, consisted in just four syllabi characterised by the presence of references only to real-life situations and other STEM areas. The third comprised 13 syllabi in which the prevailing characteristic

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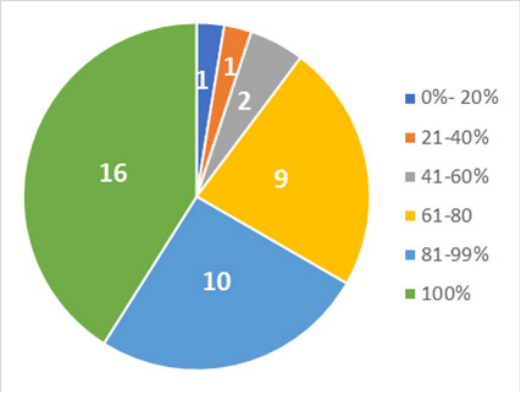
was the absence of inter-relationships between STEM areas, whilst the characteristic lacking in the 55 guides in the fourth cluster was ICT usage. In contrast, all four STEM characteristics were present in the fifth and largest cluster, with 143 guides. In other words, the syllabi in clusters 4 and 5 contained references to the three STEM characteristics analysed: problem solving, application to real-life situations, and interdisciplinarity. Whilst mathematics syllabi were observed to prevail in the third cluster, characterised by the absence of the characteristic other STEM areas, the number of those and science syllabi was similar in the other three. ICT subject syllabi were evenly distributed in the first and fourth clusters.

Once the clusters containing syllabi with references to all the STEM characteristics were identified (clusters 4 and 5), the percentage of each university's syllabi exhibiting those characteristics was found. As Graph III shows, in 16 of a total of 39 Spanish public universities 100 % of the syllabi contained references to all three STEM characteristics; in 10 universities the three characteristics were found in 81% to 99% of the documents; a percentage of 20 % was recorded for one university only. In other words, all the syllabi published by 40 % of the universities mentioned all the STEM characteristics defined here, whilst in approximately 12 % of the universities fewer than half of the syllabi in place contained such references. Nonetheless, all the universities had at least one syllabus in which all three characteristics were mentioned.

GRAPH III. Distribution of universities by percentage of experimental science, mathematics, and ICT syllabi containing references to all three STEM characteristics



Source: author formulation

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Discussion and conclusions

This study aimed to ascertain whether the present primary education curriculum in Spain can accommodate STEM education. The first of the two objectives for that purpose was to describe the STEM areas present in official university degrees qualifying for teaching primary school in Spain. A second aim was to identify the presence of STEM education characteristics (problem solving, real-life situations and interdisciplinarity) in the syllabi for STEM area-related subjects delivered by Spanish public universities.

The only two STEM areas to which subjects were explicitly devoted in the 2020/2021 curriculum were mathematics and experimental science, for they were the only two defined as requisites under the item on course breakdown by discipline in the national guidelines (MEC, 2007). The aforementioned guidelines defined neither the number of subjects nor the credits to be accorded each area, but only the total credits (100 ECTS) assigned to the disciplinary training unit. Hence the wide scatter observed around the median number of subjects (3 in mathematics and 2 in science) and mean number of credits (18 in mathematics and 15 in experimental science) assigned by the universities analysed. No specific core or requisite subjects were found for enginerering or technology, although the syllabi for mathematics and experimental science subjects contained references to technology and ICTs. Only 20 universities delivered core or requisite subjects specifically focusing on ICTs, however, even though one of the twelve general skills to be mastered by future teachers during pre-service training is 'understanding and applying information and communication technologies in the classroom' (MEC, 2007, p. 53748). The explanation for these findings may lie in the structure of the official curriculum for Primary Education (Ministerio de Educación Cultura y Deporte, 2014), which makes no mention of enginerering, includes technology under a nature science unit entitled 'Technology, objects and machines' (p. 17) and defines only two subjects, nature science and mathematics.

In connection with the second objective, of the three STEM characteristics identified (problem solving, application to real-life situations, and interdisciplinarity), only the first was observed to be present in all four curricular elements (learning expectations, content, methodology and assessment). The others were found primarily in

connection with learning expectations, although also on occasion in other elements as well.

The national guidelines proved to address interdisciplinarity, in turn, via the inclusion of 'familiarity with primary education curricular areas and their interrelationships' as one of general skills demanded of pre-service training teachers. Since that characteristic was mentioned under the curricular element learning expectations only, however, the question that arises is whether it actually forms part of pre-service teacher training. In other words, the doubt harboured is whether the syllabi are overly brief in this respect, focusing more intensely on organisational details such as types of activity or marking criteria. Over half the syllabi analysed contained all three STEM characteristics, which were likewise present in nearly all (80 % or over) the guides in place in 26 of the 39 public universities offering a degree in primary education. Admittedly, however, those guides do not necessarily mirror classroom realities and are often too pithy to furnish sufficient information.

In connection with the integration of STEM disciplines in primary education training, Aguilera et al. (2021) recommend that in multidisciplinary proposals each discipline should be introduced with its own objectives but all around a common topic, in which the professor not only describes possible social impact but explicitly relates the disciplines to one another. The present findings suggest the possibility of implementing such experiences in teacher training as it stands. Any such proposal would be most effectively rolled out if, as described by Bartels et al. (2019), the experimental science and mathematics departments cooperate in its design and inclusion and make an effort to understand what is involved in enginerering and accommodate that discipline in their suggestions. Rising to that challenge entails providing lifelong training for the teaching staff delivering the subjects in question. All post-secondary levels are deemed to be in need of substantial curricular reform, which should include a certain degree of STEM competence that today's students are lacking. That said, on occasion STEM educational proposals may be deemed to entail a partial vision of technology, often confined to references to ICT usage only (García-Carmona, 2020). As noted in earlier studies (Bartels et al., 2019), any potential institution of STEM education as part of the primary education curriculum should eschew that misguided approach and define technology in all its depth and breadth.

The conclusion drawn is that inasmuch as the absence of academic staff collaboration is one of the obstacles to the adoption of STEM teaching sequences (Margot & Kettler, 2019), such reluctance should be overcome and STEM experiences included in primary school teachers' pre-service training to prepare them to confront twenty-first century challenges. Teachers would be very unlikely to implement such teaching without the necessary prior training. The present study aims to take a first step in that direction by showing that STEM education proposals are compatible with the primary education curriculum in place in Spain.

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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

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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

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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	Nº 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.

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TABLE II. Variables used

Variable	Name	Categories
Competences. Manifested level		
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	
Recruitment factors		
Languages	V_CIDIO	Likert scale (1 *Not at all,* 2 *Notvery much,*
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 *Somewhat,* 4 *Quite a lot*, and 5 *Very much*)
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 ± 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

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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%
	$\chi2$ =105.144, p<0.000; 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%
	$\chi2$ =107.283, p<0.000; 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 ($\chi2$=10.517, p=0.005 for other professionals in the social welfare system, and $\chi2$ =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%
	$\chi2$ =10.517, p<0.005; 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%
	$\chi2$ =1279.207, p<0.000; 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

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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%).

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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%
	$\chi2$ =235.024, p<0.000; 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%
	$\chi2$ =19.930, p<0.000; 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 ($\chi2$ =70.635, p<0.000; Phi Coefficient=0.112, in the comparison with other professionals in the social welfare system, and $\chi2$ =27.384, p<0.000; 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).

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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; 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; Coefficient Phi= 0.078	

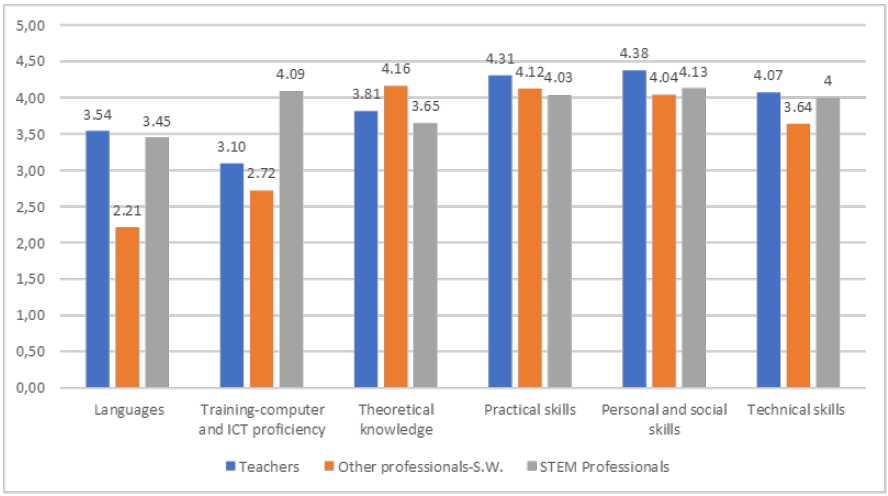
The percentage distribution of the variable *Computer courses in each* of the occupational groups is presented in each cell, together with the corrected standardised residuals. For corrected standardised residuals: ** p<0.05

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.

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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 η2=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 η2=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 η2=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 η2=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 η2=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 η2=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-Viciana 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

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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.

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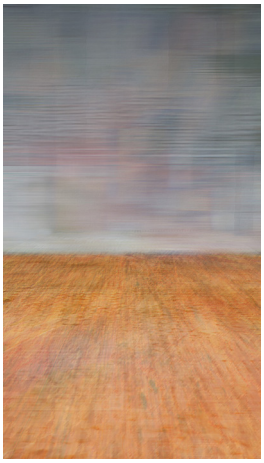


Annual report 2020

Annual report 2020. *Revista de Educación*

José Luis Gaviria
Managing editor

This This report summarizes the editorial activities of Revista de Educación in 2020. It shows the statistical data of the articles received and published, as well as the main advances in the edition of the journal.

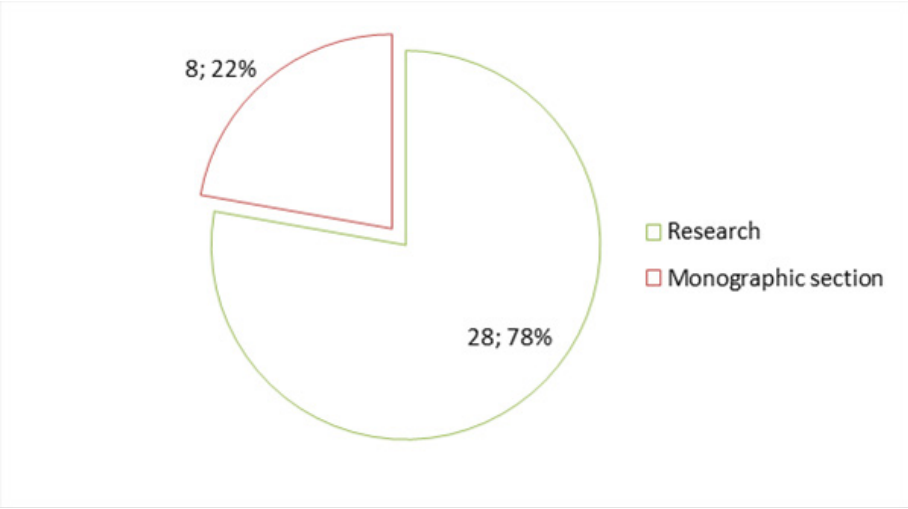
Articles received and published in 2020

Articles received by sections

Our Editorial Office received a total of 368 articles throughout 2020, representing a decrease of about 5,4 % over 2019. In figure I is shown the distribution of articles by section.

The research section still gets the largest number of originals (78%)

FIGURE I. Total number of articles received in 2020 by sections

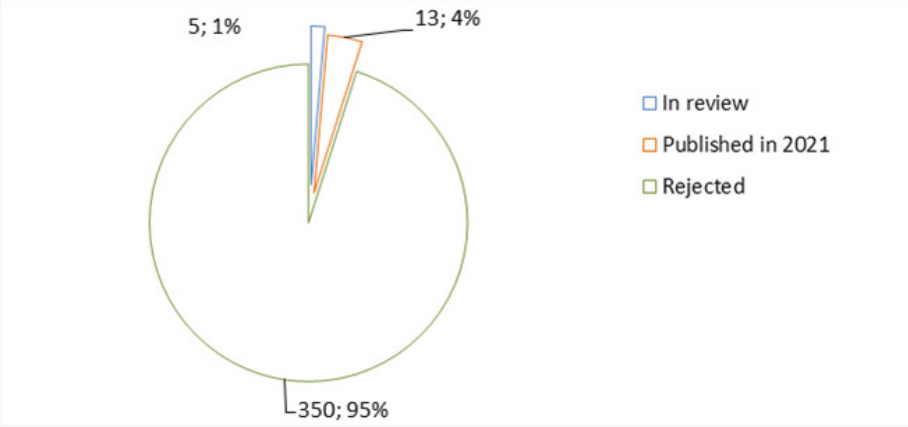


Results of the external peer-reviewed articles: Accepted and rejected articles in 2020

Of all the research articles received by the Editor, 95 % were rejected or discarded.

Of all the research papers received in 2020, 5 are still under review, 350 have been disregarded or rejected, and 13 have been published or are accepted for publication in 2020. The rest of the articles published in 2020 were not received in 2020 and therefore were not counted in this computation.

FIGURE II. Progress of the articles received in 2020



In 2020 the journal published a total of 34 articles.

The following figure shows the distribution of articles published in the different sections by year (2019-2020).

FIGURE III. Comparison of published articles by section (2019-2020)

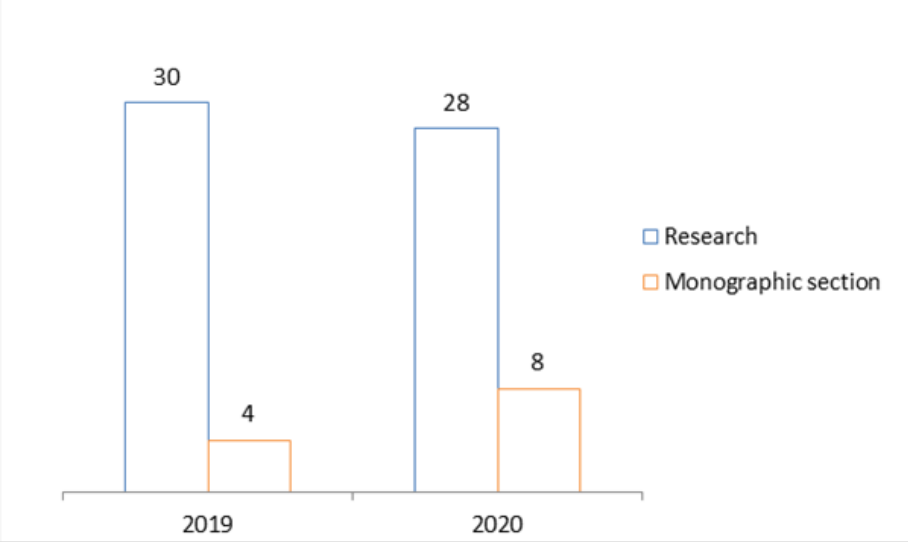
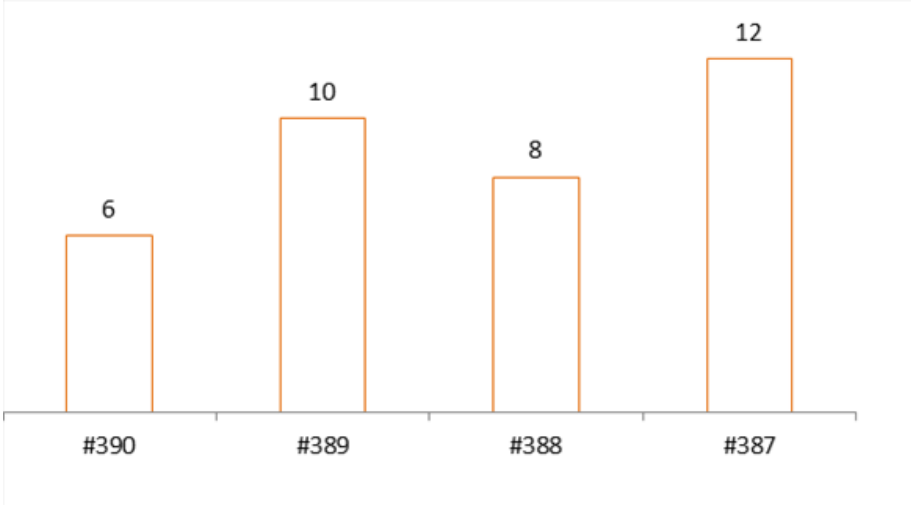


Figure IV shows the distribution of all articles published in 2020 by issue.

FIGURE IV. Articles published in each issue of the journal in 2020



The editorial policy of the journal has as a priority the publication of articles of only the highest scientific quality and the utmost general interest. This implies a reduced number of original articles published with regards to previous periods.

Publishing process: Management, revision and publication of articles

Average time between article reception and its final publication

Figure V shows the average time, in days elapsed from reception of a paper to its final publication.

Time elapsed between the reception of an original and its publication has reduced along 2020. That time depends, in general terms, on the number of articles received and, in particular, on the diligence of external reviewers.

This reduction is a primary objective of our publication, for the benefit of our journal and for the authors' benefit too.

The shorter the time between the ending of a research and its availability to the community, the better for that community and for the authors.

As for the rejected articles, it is for the best interest of the authors to know such information as soon as possible so that they can make the necessary modifications, or to find a more suitable publication mean.

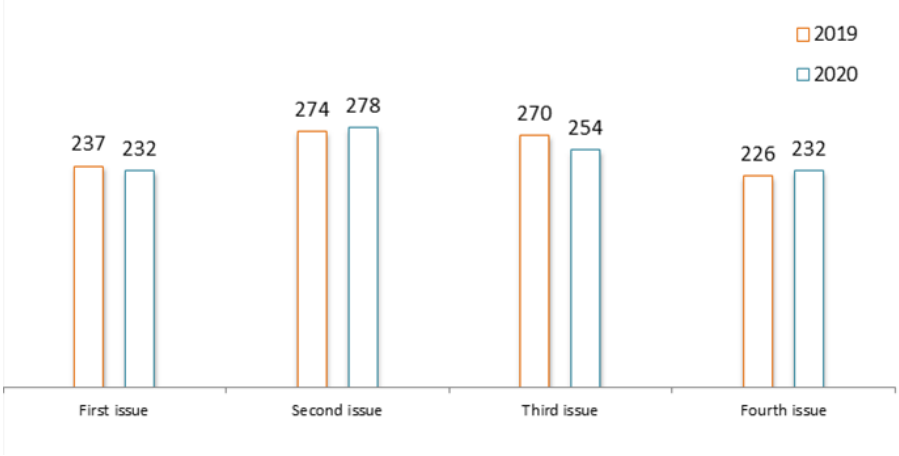
For that reason, Revista de Educación is making an effort to reduce to a minimum the processing time of articles discarded in the first review. This way the authors can look for alternatives for their manuscripts while the pressure over the reviewers of the journal is minimized, being able then to focus on articles that passed the first round.

With this objective in mind, the journal has published a list of categories of works that as a general rule, and but for cases whose exceptionality the editorial board will consider, Revista de Educación will not publish:

- Summaries of literature on a given topic
- Summaries of academic papers
- Instrument validation studies
- Evaluations of particular intervention programs
- Opinion or attitude survey results
- Reports on didactic innovations at local level
- Scientific divulgation works
- Opinion articles
- Studies in which the sample used and the method of its selection, the instruments or their technical characteristics are not clearly specified
- Works based on small or incidental samples, such as groups of students from a single school or University with little possibility of generalization

In this sense, if a work has recently been published on a given subject, it is unlikely that the same topic will be addressed again, except that the new article supposes a very relevant contribution.

FIGURE V. Average time between reception and publication of related issues (2019-2020).



2020 Revision statistics

FIGURE VI. Average time in calendar days to respond to the request for review (2020)

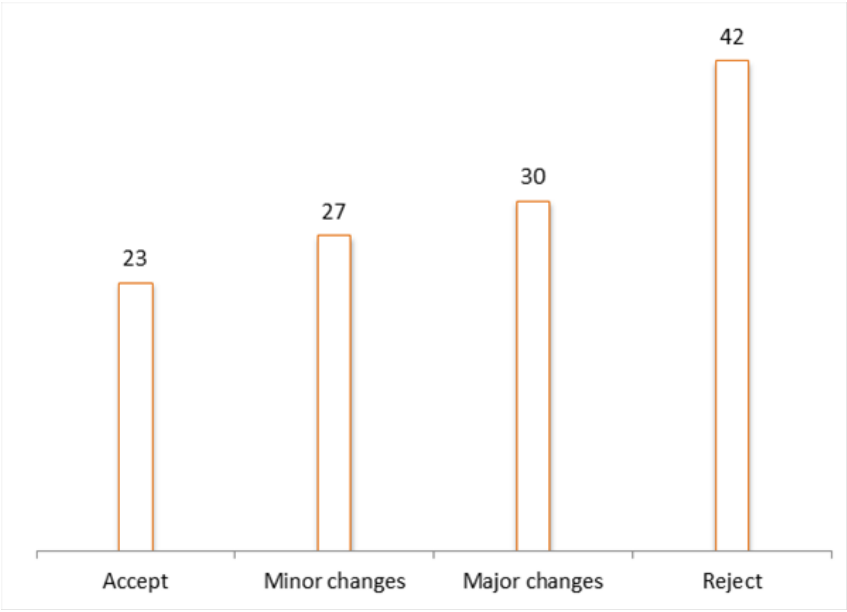
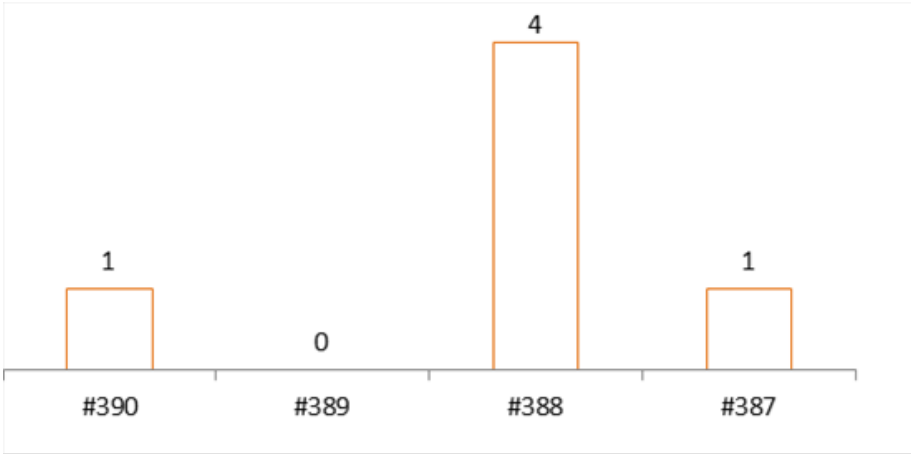


Figure VI shows that, as an average, reviewers met the term of the requested review. These are average values, implying that in some cases the process can take a significantly a longer or shorter time. As can be seen, it is precisely in the case of the rejected articles when the time involved is longer.

Dissemination of relevant works in the field of education

In 2020, 6 book reviews were published. Figure VII shows the distribution of published reviews by issue.

FIGURE VII. Books reviewed and books received in every issue published in 2020



Editorial strategy and results

Along 2020 the process initiated in 2005 has continued. This process has the objective of aligning Revista de Educación with the most demanding quality indicators for scientific journals as well as improving its impact factor, particularly in the most prestigious international databases.

Revista de Educación appears in the following sources of bibliographic documentation:

National Databases

- RESH (Revistas Españolas de Ciencias Sociales y Humanas)
- BEG (GENCAT)
- ISOC
- PSICODOC
- DIALNET
- REDINED (Red de Bases de Datos de Información Educativa)

International Databases

- Social Sciences Citation Index (SSCI)
- Social Scisearch®
- Journal Citation Reports/Social Sciences Edition
- SCOPUS (Elsevier B.V.)
- European Reference Index for the Humanities (ERIH)
- Ulrich's Periodicals Index Directory
- LATINDEX (Iberoamericana)
- Sociological Abstracts (CSA Illumina)
- PIO (Periodical Index Online, Reino Unido)
- IRESIE (México)
- ICIST (Canadá)
- HEDBIB (UNESCO-Higher Education Bibliography)
- SWETSNET (Holanda)

Platforms of journal evaluation

- SCImago Journal & Country Rank (SJR)
- CARHUS Plus+
- Matriu d'Informació per a l'Avaluació de Revistes (MIAR)
- Clasificación Integrada de Revistas Científicas (CIRC)
- Difusión y Calidad Editorial de las Revistas Españolas de Humanidades y Ciencias Sociales y Jurídicas (DICE)

National Catalogues

- Consejo Superior de Investigaciones Científicas (CSIC-ISOC)
- Red de Bibliotecas Universitarias (REBIUN)
- Centro Nacional de Innovación e Investigación Educativa (Ministerio de Educación, Cultura y Deporte)
- Catálogo Colectivo de Publicaciones Periódicas en Bibliotecas Españolas (Ministerio de Educación)

International catalogues

- WorldCat (USA)

- Online Computer Library Center (USA)
- Library of Congress (LC)
- The British Library Current Serials Received
- King's College London
- Catalogue Collectif de France (CCFr)
- Centro de Recursos Documentales e Informáticos de la Organización de Estados Iberoamericanos (OEI)
- COPAC, National, Academic and Specialist Library Catalogue (Reino Unido)
- SUDOC, Catalogue du Système Universitaire de Documentation (Francia)
- ZDB, Zeitschriftendatenbank (Alemania)

Clarivate Analytics published, in Jun 2020, the 2019 impact factor of journals indexed in the Social Sciences Citation Index (SSCI).

Revista de Educación has an impact factor of 0.761 in JCR, occupying the position 224 of 263 in the set of journals belonging to the subject category Education & Educational Research. This indicator is based on articles published in 2018 and 2017.

Comparisons with other journals on yearly basis show us a great deal of variability. That is why our goal is to keep a stable editorial line assuring a good position of the journal with regards to the consideration of the educational and scholarly community it serves.

Further information on Journal Citation Reports and the impact factor can be found at: www.accesowok.fecyt.es/jcr/

Revista de Educación is published only in electronic format, although there is an option to receive a printed version if expressly requested of the Subdirección General de Documentación y Publicaciones del Ministerio de Educación, Cultura y Deporte, which has established a printing service on demand. This same option serves subscriptions (individual and institutional), sales, and exchanges with other prestigious national and international educational journals which are included in the Education Library.

Acknowledgements

We cannot conclude this report without expressing our recognition and appreciation to all those who make Revista de Educación possible.

From authors who show their appreciation by sending us their originals, to reviewers who selflessly and objectively evaluate each paper, to all the staff working for Revista de Educación who make the publication physically possible. With the help of all of them, Revista de Educación will endure in its effort to provide the best service to education and to the educational community, by allowing the fluid and vivid exchange of the results of the best scientific research in this field.

Revista de Educación is a scientific publication of the Spanish Ministerio de Educación y Formación Profesional. Founded in 1940, with the title *'Revista de Educación'* since 1952, it has been an exceptional witness of the evolution of Education in the last decades, as well as a regarded channel for the diffusion of the advances in Research and Innovation in the field of Education from a national and international perspective. *Revista de Educación* is published by the Subdirección General de Atención al Ciudadano, Documentación y Publicaciones, and is at present attached to the Instituto Nacional de Evaluación Educativa de la Dirección General de Evaluación y Cooperación Territorial.

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