

## ARTICLE

# Beliefs on the teacher professionalism and teaching models in initial teacher education

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### ABSTRACT

The aim of this paper is to know student teachers' beliefs on the teaching profession as well as its relation with diverse teaching methods. A Likert scale questionnaire collected the opinions of 361 students enrolled in the master's degree in secondary education teacher training. A descriptive methodology was applied through a questionnaire in order to collect the data. The most extended beliefs concerning the teaching profession are identified, emphasising future teachers' interests in more practical teaching and student-centred approach. This investigation highlights the importance of including within the curriculum of pre-service secondary education teachers, activities that enable students reflect about their own beliefs regarding the teaching profession for the reasons that they are decisive to introduce changes in the teacher training curriculum.

### KEYWORDS

initial teacher training; teaching profession; educational models.

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## ***CRENÇAS SOBRE O PROFISSIONALISMO DO PROFESSOR E MODELOS DE ENSINO NA FORMAÇÃO INICIAL DE PROFESSORES***

### **RESUMO**

O objetivo deste artigo é conhecer as crenças dos professores universitários sobre a profissão docente, bem como sua relação com diversos métodos de ensino. Um questionário da escala Likert coletou as opiniões de 361 alunos matriculados no curso de mestrado para professores do ensino médio. A coleta de dados foi conduzida por metodologia descritiva, por meio de um questionário. Crenças sobre a profissão docente são identificadas, enfatizando o futuro interesse de professores no ensino mais prático e na abordagem centrada no aluno. Essa investigação ressalta a importância de incluir a reflexão de alunos sobre suas próprias crenças em relação à profissão docente no currículo das atividades dos professores do ensino médio, uma vez que estas podem ser decisivas para a introdução de mudanças no currículo de formação de professores.

### **PALAVRAS-CHAVE**

formação inicial de professores; profissão docente; modelos educativos.

## ***CREENCIAS SOBRE LA PROFESIONALIDAD DOCENTE Y LOS MODELOS DE ENSEÑANZA EN LA FORMACIÓN INICIAL DEL PROFESORADO***

### **RESUMEN**

El objetivo de este estudio es conocer las creencias del profesorado de Educación Secundaria en formación sobre la profesión docente y su relación con diversos métodos de enseñanza. Un cuestionario de escala Likert recogió las opiniones de 361 estudiantes matriculados en el máster en formación de docentes de educación secundaria. Se aplicó una metodología descriptiva a través de un cuestionario para recopilar los datos. Se identifican las creencias sobre la profesión docente, enfatizando los intereses de los futuros docentes en una enseñanza más práctica y un enfoque centrado en el alumnado. Esta investigación resalta la importancia de incluir en el plan de estudios del futuro profesorado de educación secundaria actividades y metodologías que permita a los estudiantes reflexionar acerca de sus propias creencias sobre la profesión docente y el proceso enseñanza-aprendizaje, ya que estas son decisivas para introducir cambios en el currículo de formación docente.

### **PALABRAS CLAVE**

formación inicial docente; profesionalidad docente; modelos educativos.

## INTRODUCTION

In the decade of 2000, the universities in Europe (in Spain in 2007) were preparing themselves for full convergence within the European Higher Education Area (EHEA), known as the Bologna Process. This process aimed to get harmony among European Higher Education Institutions (EHEI) and the development of students' professional and personal competences. Therefore, it brought about great and significant pedagogical and organisational changes (López, Pérez-García and Rodríguez, 2015). In addition, it undergoes a change in the focus from "teaching" on to "learning", requiring teachers' new academic roles and functions (López-Pastor *et al.*, 2013), so as to improve educational quality (Du Plessis, 2015).

Within this context of changes in Spain, a new teaching model emerged around the master's degree in secondary education teacher training.<sup>1</sup> It aims to adapt to new social and political demands as well as to improve secondary education teachers' competences. Diverse reports (Eurydice, 2012, 2013) have analysed the wide range of difficulties involved in the training process of these teachers. The new professional profile of secondary education teacher provokes a debate on which skills they must acquire and develop throughout the formative period (Lorenzo Vicente, Muñoz Galiano and Beas Miranda, 2015).

In this sense, future teachers play an important role within this process so it is both necessary and important to know not only their beliefs on the profession, but also the training needs they point out (González Sanmamed, 2009; Serrano, 2013). Future teachers' voices are relevant because they are useful to introduce possible changes in training programmes (Korthagen, Loughran and Russell, 2006).

Accordingly, several research studies about the effects of preservice preparation evince the influences they have on teachers' instructional decision-making processes and practices. Furthermore, there are changes on teachers' rationales because of the difficulty to implement concrete strategies in their school contexts as well as the growing awareness of the great distance between their beliefs and their practices, between theory and practice (Jones and Saye, 2018).

## BELIEFS ON THE TEACHER PROFESSIONALISM

The students enrolled in the master's degree in secondary teacher training have ideas, attitudes and motivations regarding teaching, learning and many other educational aspects that influence the construction of professional knowledge for the teaching practise as well as the teachers' professional identity (Sanya Pelini, 2017; Sanz, Hernando and Mula, 2015).

In regard with teacher thought, it is necessary to highlight that literature frequently includes wide diverse terms (previous ideas, preconceptions, beliefs, conceptions, implicit theories etc.) in order to refer to the opinions and thoughts that characterise teachers' professional knowledge (Nilsson, 2008; Porlán and Martín, 2004). In this sense, Pontes, Serrano and Poyato (2013) explained some differences among these terms used when analysing the teachers' initial teaching

1 Royal decree n. 1.834/2008. It defines the training conditions for teaching in compulsory secondary education level and establishes the different specialties (fields of knowledge).

thinking. Moreover, previous literature includes five terms that are used to refer to various types of ideas among pre-service teachers. According to Solís *et al.* (2013), they are defined as follows:

- “conceptions” which is generally used to refer to broader answers to open questions about a specific topic;
- the term “beliefs” is mainly used to characterize brief and concise ideas on any topic using multiple choice questions or even rating scale questionnaires (*e.g.*, Likert);
- the terms “conceptual schemes”, “though models” and “implicit theories” generally make reference to a broader set of basic ideas on a topic considering that there is some degree of articulation or internal interrelation among the ideas that make up the model or scheme.

This paper focused on the term “beliefs” to refer to pre-service teachers’ ideas regarding the teaching profession, since a Likert scale questionnaire composed of a set of very specific proposals on this subject has been used.

The development of teaching professionalism is an important issue within the educational field, but it is a complex term, which is related to many factors and has been approached from a wide range of perspectives (Darder, 2009; Ingleby, 2017). Most scholars, who have researched about this concept agree that it is a rather complex topic (Korthagen, Loughran and Russell, 2006; Mellado, Blanco and Ruiz, 1999; Pro, Valcárcel and Sánchez, 2005), given that there are many aspects to consider regarding the teachers’ professional activity (didactic content knowledge, teaching planning, design and use of educational resources, communication in the classroom, interaction with students, evaluation of learning, relationship with families and with other professionals in the same context etc.). Some studies on the teaching thinking of science teachers have tried to address teachers’ beliefs about a broad set of educational issues (learning processes, teaching methodology, nature of scientific knowledge, teacher’s teaching model etc.) (Porlán and Martín, 2004; Solís *et al.*, 2013) that involve working with many variables. As opposed to that, the research project in which this study is included was focused on very specific issues such as professional identity, initial teacher training demands and teaching competences (Serrano, 2013) so as to be able to make a deeper analysis of the data collected. Therefore, the conclusions of this study will be limited to the results obtained on this matter.

These aspects are linked to teaching professionalism and they allow considering three dimensions within the teaching profession, which are respectively related to the field of knowledge or theoretical thinking, the field of emotions or motivations and the scope of skills. Thus, pre-service teachers’ beliefs on the profession are related to these three areas but within them, a wide range of elements has been mentioned in literature (Pontes, Serrano and Poyato, 2013). Some studies reveal that they give great importance to the expertise in the field of knowledge so as to become an efficient teacher (Recchia and Puig, 2011; Reoyo *et al.*, 2012) identify other relevant aspects such as the ability to awake interest in learning among students and the development of methodological competences, whereas Valdés and

Bolívar (2014) added the skills in designing teaching resources as well as teachers' communicative competences and information and communication technology (ICT) management. Furthermore, Sutherland, Howard and Markauskaite (2010) reference to the pedagogical training and placement period as decisive factors and the interactions with other education professionals.

Pre-service and in-service teachers' conceptions regarding their profession directly influence the development of their teaching practice and their commitment to this profession (Eirín Nemiña, García Ruso and Montero Mesa, 2009; Moses *et al.*, 2017). Thus, some teacher educators are afraid of the fact that the challenges of daily classroom practices may lead early career teachers to set aside their pre-conceptions once they face their real teaching practices (Hawley, 2010; McDonough, 2017) because of the transition shock they could suffer (Chong, 2011).

One of the most controversial questions in the investigations about teachers' initial thought is that of the stability of their beliefs and resistance to the influence of training interventions. In this sense, the pedagogical beliefs of future teachers are flexible and modifiable through influence of the training program (Clark, Byrnes and Sudweeks, 2015).

The results presented in this study are part of the project<sup>2</sup> being developed to help future secondary education teachers to explicit and discuss, in the classroom, the conceptions and attitudes related to aspects that may be useful to reflect on education and teaching activity during the initial teacher training process (Ezquerro, De-Juanas and Ulloa, 2014). The problems, which can be tackled around such a general theme, can be very broad since teacher professionalism is linked to aspects such as interest in teaching, teachers' professional profile, research activities, development of teaching competences, vision of secondary education level, teachers' professional problems and the role of motivation in professional development (Beijaard, Meijer and Verloop, 2004; Bender *et al.*, 2015).

Moreover, teacher professionalism goes further than the classical concept of this profession understood as an expert in a specific subject matter. It is a dynamic process of action and cooperation reflection, of inquiry and experimentation, where teachers learn that they teach because they learn (Demirkasimoglu, 2010). Professionalism does not mean the final state to which diverse occupations are directed, but rather it is a continuous process in pursuit of a useful and responsible exercise of each profession. This process requires specific attention in the field of teachers due to the wide range of responsibilities they have and the enormous challenges society places upon them. As adults immersed in the knowledge society, beyond the traditional role of transmitters of content, it is demanded that teachers act as guides of the knowledge of their students and the learning process (Darling-Hammond and Belsford, 2005).

Most of the research studies on the development of the professionalism of secondary education teachers focus on the field of lifelong learning (Korshagen, Loughran and Russell, 2006) and teacher training (Pro, Valcárcel and Blanco, 2005), but there are also investigations that point out the need to reflect

2 This study is supported by the Research Plan of the University of Córdoba (Spain); and the FEDER funding Operational Programme in Andalusia.

on the professional development of teachers since their initial training (Pool, Reitsma and Mentz, 2013).

### TEACHING MODELS

In line with the main interest of this study, it is necessary to mention the work of Solís *et al.* (2013). Its results present interesting connections between the curricular beliefs of students and the main didactic models reflected in the literature on initial teacher thinking (Fuentes, García and Martínez, 2009). They also find a scarce evolution both in their expectations about training and in their beliefs regarding education, from which the need to introduce methodological changes in the master's degree that favour the construction of a pedagogical knowledge adequate to the needs of current secondary education (Keeley, Christopher and Buskist, 2012).

As pointed out above, the different teacher training models are related to the diverse ways of conceiving education as well as to the varied aspects that are implicitly related to teaching (Subramaniam, 2013). Based on the proposals of authors such as Witte and Jansen (2015), the literature reveals diverse educational perspectives that are related to different models of teacher training (Prats, 2016).

On the one hand, the transmissive perspective — also known as traditional perspective — gives the whole prominence to the teacher, considering them as the expert and the only responsible for transmitting discipline (Richter *et al.*, 2013). Theoretical knowledge is prioritised, understanding pedagogical training as superficial and unnecessary, even presenting an obstacle to teacher education (Reoyo *et al.*, 2012). However, Recchia and Puig (2011) warn of the need to learn skills related to their pedagogical capacities, communication, empathy, working with others, reflectivity etc (Manso and Martín, 2014; Valdés and Bolívar, 2014).

On the other hand, the technical perspective seeks solutions to take them into practise without taking into account the diversity of students, teachers and family contexts (Imbernón, 2007). In this way, the technical perspective establishes a gap that inevitably implies a hierarchical relationship among those professionals who elaborate and decide the techniques to be applied (González, 2010).

The student-centred teaching model is considered as a possible solution to the problems derived from the academic and technical perspective. Dewey (1989), a pioneer in these practical approaches, established the need to unite practice and reflection when considering that only through this binomial will the future teacher be able to contrast their theories and perfect their knowledge (Conklin, 2012). The study of Buendía *et al.* (2011) is concluded by indicating the need to acquire disciplinary knowledge and pedagogical and didactic skills so as students can develop a critical thinking that allows them to reflect and look for different alternatives of resolution according to the characteristics of the students (Kopzhassarova *et al.*, 2016).

This student-centred tendency has been shaped by the development of a professional teaching profile in order to improve the learning process (Perales *et al.*, 2014), the command of ICT (Ramírez, Cañedo and Clemente,

2012), diversity management competences (Henley, 2014), the development of motivating competences and the promotion of collaborative work (León *et al.*, 2011).

These three teaching models, whose main beliefs about teaching professionalism are analysed in this study, coincide with previous investigations on teaching thinking (Fuentes, García and Martínez, 2009; Porlán and Martín, 2004; Solís *et al.*, 2013), since not only they point out the three of them but they also refer to a supplementary model called “Spontaneous or Activist Teaching Model”, which is not reflected in the beliefs analysed here. However, there are scholars who define two antagonistic models such as the transmissive and the technical ones (Gow and Gember, 1993; Rodríguez-Arteche and Martínez-Aznar, 2018; Wallace and Kang, 2004), and others that consider up to seven models (Samuelowicz and Bain, 2001) or the five models described by Kember (1997) and lately analysed in a review carried out by Hernández and Maquilón (2010). Given this variety of positions, many authors choose to consider only three teaching models that coincide with two opposing viewpoints on educational processes (traditional or transmissive *vs.* innovative or constructivist) and an intermediate one which is more ambiguous and integrate dual or ambivalent beliefs (Hugo and Sanmartí, 2003; Mellado, Blanco and Ruiz, 1999).

All in all, there is still a long path to walk regarding initial teacher training in order to provide future teachers with the main and necessary tools to implement teaching models different from the traditional one and lessen the distance between scientific and professional (pedagogical and practical) training (Lorenzo Vicente, Muñoz Galiano and Beas Miranda, 2015).

This paper presents the results of an empirical study, which focuses on these beliefs, trying to establish useful relationships among such ideas and the underlying educational models in order to be able to introduce reforms in the formative processes according to the current educational demands. This investigation highlights the importance of including activities that enable students reflect about their own beliefs regarding the teaching profession within the curriculum of pre-service secondary education teachers (Asensio and Ruiz, 2017; Solís *et al.*, 2013).

## METHOD

### OBJECTIVES

The main aim of this study is related to the need of progressing in educational research focused on teachers’ thoughts and the teaching profession. Specific objectives are:

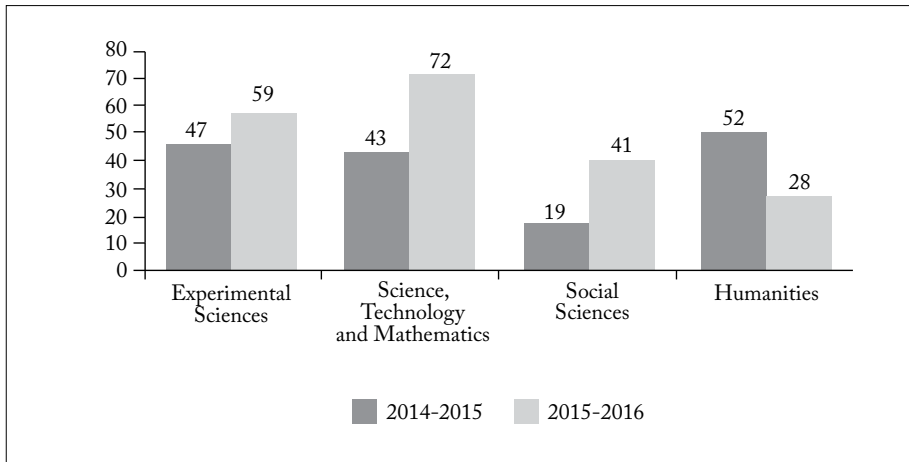
- to study the extension of the beliefs regarding the teaching profession of the students enrolled in the master’s degree in secondary teacher training; and

- to know the existing relationship between students' beliefs and the main teaching models found in literature.

### POPULATION AND SAMPLE

The population of this study is the whole group of students enrolled in the master's degree in secondary teacher training at the University of Córdoba (Spain) during 2014-2015 (44.6%) and 2015-2016 (55.4%) academic years. 94.1% of them have participated in this investigation, which means 361 students. They are between 20 and 25 years old (41.8%). In terms of gender, there is a slightly higher proportion of women (53.7%).

In order to describe the sample, participants have been gathered in four groups according to the areas of knowledge that also coincide with the different specialties of the master's degree, namely: Experimental Sciences (physics and chemistry, biology and geology, health science and sport); Instrumental Sciences (technology, design, computing and mathematics); Social Sciences (history, geography, business studies, tourism and counselling); and Humanities (foreign language, Spanish language and literature and Music) (Figure 1).



**Figure 1 – Data sample distributed by area of knowledge and academic year.**

Source: search database.

Authors' elaboration.

### INSTRUMENT

A Likert-scale questionnaire was designed with a rating scale that includes five categories. The results of a previous qualitative research, based on open questions about teaching professionalism (Pontes, Serrano and Poyato, 2013), were taken into account to design this scale. The original questionnaire was validated through experts and a pilot study.



The questionnaire was made up of 17 variables, which distinguish between general data about the participants (age, gender and field of knowledge) and the other 14 variables, which aim to value to what extent students agree with different propositions regarding beliefs about the teaching profession.

The internal consistency of the instrument generates a Cronbach's alpha value of 0.806. A comparison of means among the groups of subjects corresponding to the different areas of knowledge (Kruskal-Wallis) was carried out. Firstly, this test was applied to the four groups without finding any significant difference. Then, the means were compared between the groups of students who belong to Experimental Sciences and Instrumental Sciences by using the Kolmogorov-Smirnov (K-S) and Mann-Whitney (M-W) tests. It did not show significant differences in the majority of the items either. Therefore, we included the participants of both groups in the macro-area of Science, Technology and Mathematics (STM). The same happened with Social Science and Humanities students so we put them together in the macro-area of Social Sciences and Humanities (SSH).

Then, a comparative study between STM and SSH sub-samples was carried out by applying the K-S test. Table 1 shows the inexistence of significant differences between STM and SSH sub-samples.

**Table 1 – Mean values of items between Science, Technology and Mathematics and Social Sciences and Humanities groups.**

	Variables						
S.T.	1	2	3	4	5	6	7
Z <sub>(K-S)</sub>	.805	.456	.953	1.041	.422	1.566	.392
P	.535	.967	.324	.229	0.979	.014*	0.989
	Variables						
S.T.	8	9	10	11	12	13	14
Z <sub>(K-S)</sub>	1.356	1.055	.552	.515	.390	1.689	.530
p	.059	.216	.921	.954	.998	.007**	.941

ST: Statistical Treatment; Z (K-S): Kolmogorov-Smirnov Z test.

Source: search database.

Authors' elaboration.

To know other characteristic of the instrument, a discriminant analysis was performed by classifying the subjects into three groups (one third for each group). The Kruskal-Wallis test shows significant differences between the subjects of the different levels. The ability to discriminate such subjects can be seen in Table 2. It shows the results derived from applying the K-S to the contrast of mean values of the items among the students at extreme levels I and III of this subscale, with

significant differences ( $p^{**} < .001$ ) in all variables analysed. Therefore, we can consider that all items of the questionnaire have an adequate capacity for discrimination.

**Table 2 – Mean values of items between level I and level III subjects.**

	Variables						
S.T.	1	2	3	4	5	6	7
Z <sub>(K-S)</sub>	3.586	3.912	3.017	3.199	2.630	3.475	3.276
P	.000	.000	.000	.000	.000	.000	.000
	Variables						
S.T.	8	9	10	11	12	13	14
Z <sub>(K-S)</sub>	3.635	4.371	3.828	4.474	2.990	3.515	3.766
P	.000	.000	.000	.000	.000	.000	.000

ST: Statistical Treatment; Z (K-S): Kolmogorov-Smirnov Z test.

Source: search database.

Authors' elaboration.

## DATA COLLECTION AND ANALYSIS

The data were collected at the beginning of the specific theoretical module of the master's degree, specifically in the subject of educational contexts and processes, which has a block that refers to teaching professionalism so it addresses contents regarding the teacher professional profile as well as the access to the teaching profession. Students answered voluntarily to the scale and were informed of the purpose of the study as well as the anonymity of their answers.

The data were coded as numerical data of an ordinal scale and we applied diverse statistical processing (frequencies, mean values, M-W and K-S tests, factorial analysis, relational analysis and cluster analysis). To do so, SPSS software package was used.

## RESULTS

Results are presented according to this study's objectives. Moreover, it should be cleared up that after the previous statistical analyses (K-S and M-W), we have considered that all the subjects, regardless the area of knowledge in which they are enrolled in, are part of a representative sample of the population described above.

### BELIEFS ON THE TEACHER PROFESSION

It is observed that there are some beliefs that are widely spread while others do not count with a high level of agreement (Table 3).

**Table 3 – Results regarding the descriptive analysis about students' beliefs on the teaching profession.**

Items	*Degree of agreement (%)					Level H,M,L
	1	2	3	4	5	
1. To be a teacher, what matters is to have a broad knowledge of the contents and teach them clearly	5.5	17.7	15.8	39.6	21.3	M
2. The teaching profession can be learned and improved with theoretical and practical training	1.9	3.3	10.5	39.9	44.3	H
3. Before being a teacher, it is necessary to acquire deep knowledge about psychology, pedagogy and didactics	4.7	11.4	16.3	38.0	29.6	H
4. Aspects such as authority and the ability to lead students cannot be acquired in a training course	14.1	26.6	10.8	26.9	21.6	L
5. The main goal of teacher education is to develop the ability to engage students in the learning process	0.8	9.1	19.7	46.0	24.4	H
6. Secondary education teacher is mainly a specialist in their subject and that training can only be acquired during their degree studies	20.5	27.4	12.7	28.8	10.5	L
7. To motivate students to learn is necessary to acquire some skills closely related to the teaching profession	2.8	10.8	16.6	41.0	28.8	H
8. The best teachers are people with the innate qualities to communicate and teach	11.1	30.2	12,5	32.7	13.6	L
9. Training must focus on learning how to plan lessons and master communication techniques in the classroom	7.8	24.1	15.8	37.1	15.2	M
10. Teacher training is only acquired through experience	12.2	22.4	15.0	32.4	18.0	L
11. Initial training should help teachers to develop a professional identity focused on educational problems	7.2	26.9	17.5	35.5	13.0	L
12. The main quality is the vocation but it is not acquired through pedagogical training courses	6.4	17.5	29.1	30.5	16.6	M
13. Currently, it is not easy to be a secondary education teacher, especially if you have not been trained before for this purpose	7.2	23.0	13.0	35.2	21.6	M
14. Any graduated student is able to acquire in a postgraduate course the necessary teacher training to properly carry out this task as well as the rest of functions required by the current secondary education trend	4.7	9.1	11.9	43.5	30.7	H

\*Levels of agreement: 1 = Nothing; 2 = Little; 3 = Intermediate; 4 = Quite; 5 = Much.

Source: search database.

Authors' elaboration.

The response variable 4 is the one with the highest percentages compared with the other response variables. Minimum and maximum values range from 9% in item 4 on the acquisition of aspects such as authority or ability to lead and 46% in item 5 on the development of motivational techniques.

If we order these items in term of mean values, we can classify such ideas in three subcategories: beliefs with a low level of acceptance (L), with a medium level of acceptance (M) and with a high level of acceptance (H).

## RELATIONSHIP BETWEEN BELIEFS ON THE TEACHING PROFESSION AND TEACHING MODELS

First of all, an analysis of similarity coefficients and a partial correlation study among the variables, which aim to explore possible clusters of different ideas from the previous analyses, were carried out. We have found three sub-dimensions that gather ideas related to diverse teaching models described in the literature. Furthermore, we found a fourth sub-dimension, which includes more dispersed ideas that do not present any relation to these teaching models. Once the sub-dimensions were defined, a cluster analysis was performed to see whether there are groups of subjects that share or not such sets of ideas. In order to simplify the analysis, we grouped them by the extremes of the five response categories of the different items as follows: I = nothing or little agreement; II = intermediate agreement; III = quite or strongly agree.

### *Sub-dimension I: Transmissive Teaching Model (TrTM)*

Table 4 shows the questionnaire's items included in this sub-dimension (1, 6, 8 and 10) in descending order according to the mean value of variable previously obtained.

The results show that two-fifths of the subjects that study this master's degree seem to be largely identified with most of the ideas collected in the traditional teaching models.

**Table 4 – Descriptive data and cluster analysis – Sub-dimension I (Transmissive Teaching Model) and Spearman's Rho.**

Grouped variables (TrTM)	I (Disagree)		II (Intermediate)		III (Agree)	
	Freq	%	Freq	%	Freq	%
1. To be a teacher, what matters is to have a broad knowledge of the contents and teach them clearly	84	23.3	57	15.8	220	60.9
10. Teacher training is only acquired through experience	125	34.6	54	15.0	182	50.4
8. The best teachers are people with the innate qualities to communicate and teach	149	41.3	45	12.5	167	46.3
6. Secondary education teacher is mainly a specialist in their subject and that training can only be acquired during their degree studies	173	47.9	46	12.7	142	39.3

### Cluster Analysis in TrTM

Cluster 1		Cluster 2		Cluster 3	
Freq	%	Freq	%	Freq	%
82	22.7	134	37.1	145	40.2

### Spearman's Rho

	6	8	10	TrTM
1	0.154**	0.132*	0.108	0.471**
6		0.201**	0.203**	0.638**
8			0.170**	0.578**
10				0.580**

\* p<0.05, \*\* p<0.01. Source: search database. Authors' elaboration.

They consider it highly necessary to have a broad knowledge of the contents and to teach them clearly. They emphasise that the secondary education teacher is a specialist in their field. At the same time, they assume the need to acquire specific training for the practice of teaching, although they consider that training is acquired mainly through experience. On the other hand, we observe that a little less than a quarter of the students show little agreement with the ideas gathered in this model of teacher thought (cluster 1) and slightly more than a third of these subjects present a degree of intermediate agreement (cluster 2).

A correlation analysis between the variables grouped in this sub-dimension was performed and the global variable that binds them all (TrTM). The “Spearman’s Rho” correlation coefficients between these variables and the TrTM sub-dimension were obtained, finding high values (near or higher than 0.50) in the four cases and observing that such associations are quite significant ( $p < 0.05$ ). Therefore, we can consider that the ideas grouped in this subscale show a moderate degree of internal consistency.

#### *Sub-dimension II: Technical Teaching Model (TeTM)*

The second sub-dimension grouped beliefs related to the Technical Teaching Model (TeTM) since they consider teacher education as a process, which mainly aims to acquire both theoretical and practical teaching techniques.

On the one hand, these results show that ideas related to TeTM are quite widespread. The majority of participants believe that the teaching profession can be learned and improved with theoretical and practical training, but they also consider that every graduated student can acquire the necessary teaching skills in the master’s degree.

On the other hand, slightly more than half of the surveyed students think that teacher training should focus on learning to plan teaching and mastering communication techniques in the classroom. Thus, they give great importance to the acquisition of technical skills. Cluster analysis shows that more than two-fifths of the students share all of these ideas with a high degree of agreement.

The results of the non-parametric correlation analysis between the variables grouped in this sub-dimension and the global variable that binds them all (TeTM), shows high values in the coefficients (higher than 0.57), and such associations are quite significant ( $p < 0.05$ ) in all three cases. All in all, it leads us to consider that the ideas grouped in this sub-dimension have a high internal consistency level (Table 5).

#### *Sub-dimension III: Student Centred Teaching Model (SCTM)*

The third sub-dimension gathers beliefs with regards to a constructivist-teaching model that we have called Student Centred Teaching Model (SCTM). This model attributes importance to the development of professional identity and the need to acquire complete teaching training, which help to understand the psychological, pedagogical and didactic aspects linked to the learning process.

**Table 5 – Descriptive data and cluster analysis – Sub-dimension II (Technical Teaching Model) and Spearman's Rho.**

Grouped variables (TeTM)	I (Disagree)		II (Intermediate)		III (Agree)	
	Freq	%	Freq	%	Freq	%
2. The teaching profession can be learned and improved with theoretical and practical training	19	5.3	38	10.5	304	84.2
14. Any graduated student is able to acquire in a postgraduate course the necessary teacher training to properly carry out this task as well as the rest of the functions required by the current secondary education trend	50	13.9	43	11.9	268	74.2
9. Training must focus on learning how to plan lessons and master communication techniques in the classroom	115	31.9	57	15.8	189	52.4

**Cluster analysis in TeTM**

Cluster 1		Cluster 2		Cluster 3	
Freq	%	Freq	%	Freq	%
93	25.8	117	32.4	151	41.8

**Spearman's Rho**

	9	14	TeTM
2	0.176**	0.804**	0.567**
9		0.082	0.660**
14			0.571**

\*  $p < 0.05$ , \*\*  $p < 0.01$ . Source: search database. Authors' elaboration.

Every idea related to this SCTM are quite expanded. The majority of them consider that the main aims of teacher training are to develop the appropriate skills so as to engage students within the learning process and to acquire knowledge regarding psychology, pedagogy and didactic. Half of participants seem to identify themselves with this model, as seen in Table 6. About a quarter of surveyed students show an intermediate degree of identification (cluster 2), and the rest, which means another quarter, seem to disagree with the set of ideas gathered in cluster 1.

The results of non-parametric correlation analysis between the variables grouped in this sub-dimension (3,5,7 and 11) and the global variable that binds them all (SCTM) also show high values in "Spearman's Rho" coefficients (higher than 0.58). Moreover, the associations are quite significant ( $p < 0.01$ ) in all four cases. Therefore, we can consider that the ideas grouped in this subscale have a high degree of internal consistency as a whole.

**Table 6 – Descriptive data and cluster analysis – Sub-dimension III (Student Centred Teaching Model) and Spearman's Rho.**

Grouped variables (SCTM)	I (Disagree)		II (Intermediate)		III (Agree)	
	Freq	%	Freq	%	Freq	%
5. The main goal of teacher education is to develop the ability to engage students in the learning process	36	10.0	71	19.7	254	70.4
7. To motivate students to learn is necessary to acquire some skills closely related to the teaching profession	49	13.6	60	16.6	252	69.8
3. Before being a teacher, it is necessary to acquire deep knowledge about psychology, pedagogy and didactics	58	16.1	59	16.3	244	67.6
11. Initial training should help teachers to develop a professional identity focused on educational problems	123	34.1	63	17.5	175	48.5

**Cluster analysis in SCTM**

Cluster 1		Cluster 2		Cluster 3	
Freq	%	Freq	%	Freq	%
91	25.2	89	24.7	181	50.1

**Spearman's Rho**

	5	7	11	SCTM
3	0.269**	0.389**	0.235**	0.609**
5		0.426**	0.184**	0.567**
7			0.187**	0.632**
11				0.664**

\* p<0.05, \*\* p<0.01. Source: search database. Authors' elaboration.

**Sub-dimension IV: Indefinite Student Teaching Model (ITM)**

This last sub-dimension assembles beliefs that cannot be directly connected to any determine teaching model; therefore, they can be related to any teaching models explained before. Table 7 shows that more than half of the participants agree that nowadays being a teacher is not an easy task, especially if their degree qualification is not related to their field of knowledge (medicine, engineering, law, chemistry, history, etc.). Then, a similar proportion of subjects consider that the main quality has to do with vocation but it cannot be acquired through pedagogical training courses.

**Table 7 – Descriptive data and cluster analysis – Sub-dimension IV (Indefinite Student Teaching Model) and Spearman’s Rho.**

Grouped variables (ITM)	I (Disagree)		II (Intermediate)		III (Agree)	
	Freq	%	Freq	%	Freq	%
13. Currently, it is not easy to be a secondary education teacher, especially if you have not been trained before for this purpose	109	30.2	47	13.0	205	56.8
12. The main quality is the vocation but it is not acquired through pedagogical training courses	86	23.8	105	29.1	170	47.1
4. Aspects such as authority and the ability to lead students cannot be acquired in a training course	147	40.7	39	10.8	175	48.5

**Cluster analysis in ITM**

Cluster 1		Cluster 2		Cluster 3	
Freq	%	Freq	%	Freq	%
151	41.8	108	29.9	102	28.3

**Spearman’s Rho**

	12	13	ITM
4	0.181*	0.027	0.333**
12		0.002	0.273**
13			0.159*

\* p<0.05, \*\* p<0.01. Source: search database. Authors’ elaboration.

There are other aspects, which are important for the teaching exercise such as the teacher’s authority or the ability to manage students’ work in the classroom. Around two fifth parts of the participants do not identify themselves with the ideas gathered within sub-dimension IV (cluster 1), but one third part does agree (cluster 3) and the rest are in an intermediate position (cluster 2). It is, therefore, a set of interesting but heterogeneous and dispersed ideas.

Finally, the results of non-parametric correlation analysis between variables in this sub-dimension and the global variable which bind all together (ITM), show moderate values in “Spearman’s Rho” coefficient (higher than 0.44) and the associate ones are significant in the three cases (p<0.05). Thus, we can consider that those grouped in this sub-dimension count with a satisfactory consistency level.



## DISCUSSION AND CONCLUSIONS

This study has analysed pre-service secondary education teachers' beliefs regarding the teaching profession as well as the possible connections between diverse teaching models and these thoughts. It should be highlighted that there are three teaching models that gather most of the participants' beliefs, namely TrTM, TeTM and SCTM. However, there are three ideas that do not directly fit with any model.

In regard with the first objective of our study, we observe that students enrolled in the master's degree in secondary teacher training show an interest in the different aspects that the teaching profession entails. More specifically, the participants value the need to acquire a didactic and psycho-pedagogical training, which complements the disciplinary instruction. They give special importance to a methodological training, which provides them with competences to foster students' interest and motivation in the classroom (Prats, 2016; Recchia and Puig, 2011), design appropriate teaching materials, encourage classroom coexistence, improve the teacher communicative process and learn to work in teams (Reoyo *et al.*, 2012; Valdés and Bolívar, 2014).

The interest in acquiring an adequate teacher training contrasts with the results of previous studies that point out the existence of the formative deficiencies among future secondary education teachers (Serrano and Pontes, 2015; Solís *et al.*, 2013). These authors compare pre-service teachers' beliefs at the beginning of the teacher training program and at the end, observing few differences. Moreover, they appreciate that they point out the need to rethink this training. Other authors relate these needs to the persistence and resistance to changes in traditional beliefs about the teaching of future teachers, highlighting the need to promote appropriate interventions during initial training so that their beliefs about the teaching profession can change and evolve (Porlán and Martín, 2004). Moreover, these required changes might also motivate future Secondary teachers implementing innovative teaching methods in their daily practise (Lorenzo Vicente, Muñoz Galiano and Beas Miranda, 2015).

In this study, some of the most widespread beliefs about the teaching profession are related to some teaching models, such as the teaching-learning model based on the transmission and reception of knowledge (Fuentes, García and Martínez, 2009; Prats, 2016; Recchia and Puig, 2011). This relationship is revealed, in this study, through the importance that participants give to academic knowledge grounding that the teacher must have and the need to be a specialist in their subject as well as the communicative skills so as to properly teach every content (Recchia and Puig, 2011).

Furthermore, the Technical Model is also quite widespread among their conceptions. This model concedes more importance to disciplinary training, communication techniques and teacher practice to the detriment of the more strictly psycho-pedagogical formation. Therefore, we can conclude that a perceptible part of the participants considers that to be in secondary education, it is necessary to combine both theoretical (academic knowledge) and practical training (communication techniques and strategies).

However, we observe that one of the most widespread beliefs are linked to the SCTM, which focuses on the importance of methodological skills in order to organise classroom work and encourage the interest of secondary education students in the learning process (Ramírez, Cañedo and Clemente, 2012). It is relevant that despite the fact that participants show persistence to traditional education approaches, they are also theoretically identified with the beliefs related to SCTM, at least, along their initial training (Pontes, Serrano and Poyato, 2013). The existence of such beliefs can be taken as the starting point to build adequate professional knowledge, from the reflection on the teaching practice and the search for solutions to the problems of teaching and learning processes (Jones and Saye, 2018; Manso and Martín, 2014; Pro, Valcárcel and Blanco, 2005; Reoyo *et al.*, 2012), adapted to the different educational contexts (Henley, 2014; Valdés and Bolívar, 2014).

On the one hand, teaching models that describe pre-service teacher in their initial training do not correspond with rigid conceptual schemes due to the fact that a student can simultaneously maintain beliefs related to relatively different models (Hernández and Maquilón, 2010). Consequently, these initial thoughts can be modified according to the teaching strategies used by teacher educators as well as the activities proposed in the classroom such as reflexive activities and critical-thinking activities that engage pre-service teachers and enhance debates about the teaching profession (Rodríguez-Arteche and Martínez-Aznar, 2018). On the other hand, there is always a margin of ambiguity when it comes to making explicit the initial teaching thinking, especially if open questions are used (Serrano, 2013), so that it will not always be possible to characterize the cognitive beliefs of secondary education pre-service teachers in terms of closed and inflexible teaching models, which may explain the existence of undefined or ambivalent beliefs, such as the fourth model of this study (ITM). Although the beliefs included within ITM show a certain degree of internal relationship, they do not point to any defined teaching model in literature but rather an absence of well-defined educational approaches.

In this sense, we can conclude that beliefs regarding teaching models evolve through teacher training and experience (Mellado, Blanco and Ruiz, 1999) so it gives greater value to this study since one must always start from the initial knowledge to develop adequate teacher training curriculum that favour the exchange of ideas and the professional development as teachers (Rodríguez-Arteche and Martínez-Aznar, 2018).

Finally, these results could positively contribute to the transformative and adaptation process of education to new social demands and EHEA for the reason that it enables knowing in detail not only pre-service teachers' beliefs but also these thoughts can be related to the teaching methods, which, they could use in the near future. This way, through an effective training programme, these beliefs should be modified so they are more competent to carry out their profession. In this sense, the purpose of this study is to know better pre-service teachers' beliefs so as to introduce concrete changes in the teacher training curriculum that favour the development of a desirable professional thinking (Porlán and Martín, 2004) and adequate teaching competences (Perales *et al.*, 2014).

As has been shown, the information provided by the groups of participants may, therefore, be of great use when defining and designing proposals for new degrees. This information is also fundamental for the system to guarantee the quality of the educational programmes at different levels. The participants' opinions could assist in the continual improvement of the setting up of teaching and the reformulation of new objectives. Finally, the results presented in this paper belong to a wider research project which aims to help future secondary education teachers to explicit and discuss their conceptions and attitudes in the classroom related to aspects that may be useful to reflect on education and teaching activities during the initial teacher training process.

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