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ARTICLE

Teacher competencies, technology and personality among secondary education master's students

Competencias docentes, tecnología y personalidad de los estudiantes del Máster de Secundaria

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Abstract: This study, carried out for predictive and diagnostic purposes, analyses the acquisition of teacher competencies and the integration of technology in learning, as related to personality, among students on the Master's in Secondary Education at the University of Castilla-La Mancha (Spain). Methodology: 241 students (105 men and 136 women) from the 2019–2020 cohort took part. To evaluate the self-efficacy of teacher competencies, the scale of six competencies was used, taking into account the context of practice. To assess the impact of technology on learning, the bifactorial scale of learning and learning strategies was used, and the BFI-10 questionnaire was used to assess personality traits. A correlation analysis was carried out, 12 mediation models were calculated, and a bootstrap analysis was conducted to calculate the indirect effects of the mediations. The results show that the acquisition of all teacher competencies is significantly and positively correlated with technology learning, particularly subject knowledge, and methodological competence, where the traits of conscientiousness and openness are significant. Of the 12 mediation models, the model that showed partial mediation was competence for collaboration with tutors, predicted by technology learning, mediated by conscientiousness. The findings show an understanding of how to steer university training in the context of the current education system.

Keywords: Competences, Technology, Personality, Secondary Master.

Resumen: Con fines predictivos y de diagnóstico, se presenta un estudio en el que se analiza la adquisición de las competencias docentes, la integración de las tecnologías en el aprendizaje, relacionado con la personalidad, de los estudiantes del Máster de Secundaria de la Universidad de Castilla-La Mancha. Metodología: han participado 241 estudiantes (105 hombres y 136 mujeres) del cuso académico 2019-2020. Para evaluar la autoeficacia de las competencias docentes se utilizó la escala de 6 competencias teniendo en cuenta el contexto real de práctica; para valorar el impacto que generan las tecnologías en el propio aprendizaje la escala bifactorial factor de aprendizaje y factor estrategias de aprendizaje y para evaluar los rasgos de la personalidad se utilizó el cuestionario BFI-10. Se llevó a cabo un análisis correlacional, se calcularon 12 modelos de mediación y se realizó un análisis de bootstrap para el cálculo de los efectos indirectos de las mediaciones. Los resultados arrojan que la adquisición de todas las competencias docentes tiene una correlación significativa y positiva con el aprendizaje de las tecnologías, destacando la competencia del conocimiento de la asignatura y competencia metodológica, donde el rasgo de responsabilidad y apertura son significativos. De los 12 modelos de mediación el modelo que mostró mediación parcial fue la competencia para colaborar con los profesores predicho por el aprendizaje de las tecnologías, mediado por la responsabilidad. Lo hallado representa comprender cómo guiar la formación universitaria para poder dar respuesta al sistema educativo actual.

Palabras clave: Competencias docentes, Tecnología, Personalidad, Máster de Educación Secundaria.

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1. Introduction

The new socialising functions ascribed to teachers, and the increasingly important role of the integration of information and communications technologies (ICTs) into teaching practice, have led to dramatic changes in how teaching is carried out in recent years (Tello and Aguaded, 2009). This presents new educational challenges in terms of the development of competencies among future teachers, as related to personality, meaning new levels of good practice must be met in initial training.

It is clear that any attempt to change the education system goes hand in hand with the initial training of teachers, demanding analysis, reflection, planning and organisation of professional development, even staying one step ahead of the system itself, to ensure that future teachers are not out of step when they enter the job market.

University programmes are key. Students are immersed in a teaching-learning process where they must learn the competencies demanded of them in practice and which shape the excellent, effective teacher (Del Valle and Rodriguez, 2017).

In developing these competencies, the perception of self-efficacy is a significant variable (Bandura, 1997; Van Dinther, Dochy and Segers, 2011; Van Dinther et al., 2013). There are studies on the importance of teacher self-efficacy carried out with working teachers (Tschannen-Moran and Woolfolk Hoy, 2001; Woolfolk Hoy and Davis, 2006), which should also be carried out with students. It is clear that the earlier teacher self-efficacy beliefs can be shaped, the greater the possibility to adjust the training received by students, depending on the reality of the situation (Bandura, 1997, Woolfolk Hoy and Burke-Spero, 2005). The important role technology currently plays should also not be forgotten it is technology that sets the pace in education. Educational innovation has shown the importance of integrating digital technologies into learning. In relation to future teachers, it is assumed that as digital citizens they have a good command of technology (Prensky, 2001; White and Le Cornu, 2011). Nevertheless, some studies show that technical competence does not always meet the needs of future teachers to integrate technologies as learning tools (Arabit-Garcia et al., 2021; Ferrero-de-Lucas et al., 2021; González, Román and Prendes, 2018; Prendes et al., 2017; Tadeu, 2020), since the way in which one learns, the type of professional environment and personality traits interact and influence one another (Segura, 2022; Zhang, 2004).

Therefore, evaluating for predictive and diagnostic purposes the students´ self-efficacy in the acquisition of teacher competencies and the integration of ICTs in learning, as related to personality, sheds light on how to steer university training in the context of the current education system on Master's in Secondary and High School Education, Professional Training and Language Teaching (MUFPS).

1.1. Teacher competencies

Self-efficacy from the perspective of Bandura's (1997) cognitive social theory is significant in any human domain (Pajares, 1996; Schunk, 2003). In the field of education, teacher self-efficacy is defined as the belief that the teacher has the capacity to have a positive effect on their students' learning (Villaverde-Caramés et al., 2021; Birisci and Kul, 2019; Cajo and Gisbert-Cervera, 2022; Mérida-López and Extremera, 2019; Costa, Palma, and Salgado, 2021). Studies analyse teacher self-efficacy through

student performance and motivation (Caprara et al., 2006; Muijs and Reynolds, 2001), effectiveness of practices (Chacon, 2005; Depaepe and König, 2018; Woolfolk and Hoy 1990; Woolfolk et al., 1990), attention given to students with specific educational needs (Collado-Sanchis et al., 2020; De Dios et al., 2019; Murillo et al., 2020) and personal well-being (Klassen and Chiu, 2011; Shoji et al., 2016; Zee and Koomen, 2016).

Therefore, effectively carrying out teaching tasks requires good command of a range of different types of knowledge and abilities, as well as affective-motivational dispositions (De Coninck et al., 2020; Guerriero, 2017). In addition, it is important to recognise that work on teacher self-efficacy is most fruitful at the early stages of the learning process (Bandura, 1997). Thus, this study is of particular interest since it analyses teacher competencies acquired at an early stage, with a direct impact on teaching (De Coninck et al., 2020; Pfitzner-Eden, 2016).

Different studies have assessed the teacher self-efficacy of student teachers. Tigelaar et al. (2004) have developed and validated a scale to evaluate teacher competencies in higher education, identifying four competencies: person as teacher, expert on content knowledge, facilitator of learning processes, and organiser and scholar/lifelong learner. Studies in this area include those by Baena-Extremera, Granero-Gallegos and Martínez-Molina (2015), Del Valle, De la Vega and Rodriguez (2015), Hernández et al. (2010), Luna and Reyes (2015), Sanz, Hernando and Mula (2015), and Valdivieso, Carbonero and Martín-Antón (2013), highlighting four teacher competencies (command of teaching content, didactic teaching knowledge, management/organisation of the session, leadership capacity and relations with others), although it is worth reflecting on whether this covers the full complexity of the educational context. Pendergast, Garvis and Keogh (2011) and Ekici (2018) apply the Teachers' Sense of Efficacy Scale (TSES) (Tschannen-Moran and Woolfolk Hoy, 2001) to students. Based on the TSES, Van Dinther et al. (2013) validate another self-efficacy measurement scale for student teachers, identifying six competencies (interpersonal competence, pedagogical competence, subject knowledge and methodological competence, organisational competence, competence for collaboration with colleagues, and competence for reflection and development), spanning the complexity of real experiences in practice, where teacher competencies are developed.

Therefore, it seems important that student teacher training programmes pay attention to the development of teacher competencies (Van Dinther et al., 2013), as part of the learning process in the context of real practice.

1.2. The integration of technology

There is currently a great deal of interest in the general incorporation of ICTs in education (Ballesteros et al., 2010). Initial teacher training is no exception, since this represents a crucial learning tool (Gil and Roca-Piera, 2011; Oliver, 2011; Selwyn, 2012).

Through the integration of ICTs in education, students can develop new teaching-learning strategies and activities which in the past were unimaginable. Prieto et al. (2010) recognise how ICT implementation impacts university teacher training programmes as a means of accessing, discovering, and processing information and generating communication. This involves new challenges for student teachers, since having a command of ICTs strengthens the development of teachers' professional competencies (Abarca, 2015; Coscollola and Fuentes, 2010; Edmunds, Thorpe and

Conole, 2012; Peinado and Navarro, 2014; Silva, Usart and Lázaro-Cantabrana, 2019), leading to methodological innovation, which increases motivation and participation among students, which is related in turn to an improvement in academic performance, impacting the self-regulation of the self-efficacy of the student teacher.

Therefore, it is interesting to analyse the level of use and command of ICTs, understood as available technological resources, since this represents a challenge in the development of teacher competencies (Alcántara, 2015; Pontes-Pedrajas, 2005; Tumino and Bournissen, 2019; Unigarro, 2004). This paper aims to analyse the level of impact ICT implementation has on the learning process. That is, the extent to which the use of ICTs as a tool supports the learning of teacher competencies, constituting a complex digital literacy generating knowledge construction, including knowing how to use ICTs in the classroom, as well as how to design practices in a given context, as noted by Ketil (2019), in order to minimise the anxiety this can cause among students (Erdener and Kandemir, 2019).

Students' perception of ICTs must be carefully analysed, since this is at the forefront of the enormous educational change currently being witnessed (Cosi et al., 2020; Sanz-Ponce, Hernando-Mora and Mula-Benavent, 2015).

In the academic literature, two distinct lines of study can be found. The first focuses on the levels of digital competence (skills, capabilities, and attitudes) that teachers should develop by including ICTs in their practice and professional development (Lázaro, Usart and Gisbert, 2019; Tourón et al., 2018; Usart, Lázaro and Gisbert, 2021), in line with proposals by the European Union and the Spanish Ministry of Education. The second is focused on evaluating the impact of ICTs on learning itself, concluding that ICTs help build knowledge and lead to cognitive improvement among students (Balas-Nakash et al., 2010; Tumino and Bournissen, 2019; Riascos-Erazo, Quintero-Calvache and Ávila-Fajardo, 2010), in relation to the learning of competencies among student teachers.

Hence, in line with this second line of enquiry, we aim to analyse the effect of the integration of ICTs on the learning of competencies among student teachers, in the context of real practice, since the perception of the usefulness and ease of use of ICTs fosters a positive attitude towards the incorporation of technology in the professional environment (Edmunds, Thorpe and Conole, 2012).

1.3. Personality

According to Bandura's triadic model (1997), behaviour is the result of the interaction between person and environment, which are intertwined with each other, transferable to the educational context in accordance with teacher self-efficacy. Therefore, the personality of student teachers could be seen as a valuable element in the development of teacher competencies, since it is through personality that one is able to perform behaviours and understand the different behaviours of others (Phares, 1996).

Since the twentieth century, personality has been analysed in detail through different theories. Although personality is not a new area of study, there is currently a trend to identify the different traits and to measure this construct through factors. There are two approaches: one weaker, which considers traits as constructed

dispositions that do not necessarily imply something endogenous and genotypical (Romero, 2005), and another stronger approach focused on the traits model and on the growing interest in the factorial study of personality (McCrae and Costa, 1990), known as the big five factor model (BFF). Of the many questionnaires developed, Cupani et al. (2019) identify the Ten-Item Personality Inventory (TIPI; Gosling, Rentfrow and Swann, 2003), the Mini-IPIP (Donnellan et al., 2006), the BFI-2-S and BFI-2-XS (Soto and John, 2017), the Abridged Big Five (Langford, 2003), the Five-Item Measure of the Big Five (Aronson, Reilly and Lynn, 2006) and the Big Five Inventory-10 questionnaire (BFI-10; Rammstedt and John, 2007), which are of interest here since they have adaptations for adults (Castro, 2002; Castro and Casullo, 2001) and for university students (Domínguez-Lara and Merino-Soto, 2018).

Therefore, the aim of the present study is to analyse the degree of self-efficacy of teacher competencies acquired by MUFPS students, taking into account ICT learning, mediated by the main personality traits.

2. Methods

The study is descriptive, quantitative, correlational, and transversal (Montero and León, 2007).

2.1. Participants

A total of 241 students took part in the study, selected according to the criteria of currently being enrolled on the MUFPS course at the University of Castilla-La Mancha (UCLM), as part of the 2019–2020 cohort. Of these, 105 were male, between the ages of 20.30 and 59.60 years (M = 28.46; SD = 6.98), and 136 female, aged between 20.30 and 57.40 years (M = 27.99; SD = 6.90). The sample has a similar distribution of men (43.6%) and women (56.4%). Access to the course came via doctoral degree (2), master's degree (46), bachelor's degree (160), graduates (30) or an entrance exam (3).

2.2. Instruments

To evaluate the self-efficacy of the students' teacher competencies, the Van Dinther et al. (2013) scale was used (CFI = .918; RMSEA [90%] = .061), made up of six factors (interpersonal competence (INT) = .736; pedagogical competence (PED) = .784; subject knowledge and methodological competence (SKM) = .856; organisational competence (ORG) = .882; competence for collaboration with tutors (COL) = .804; competence for reflection and development (REF) = .887), and 22 items (INT = 2; PED = 4; SKM = 5; ORG = 4; COL = 3; REF = 4). Response options were on a scale of 0– 100, where 0 = not at all true, 50 = moderately true, and 100 = completely true. For example: INT = 'I have seen what has happened in the classroom. I have encouraged positive behaviour'; PED = 'I have shown my interest in each student'; SKM = 'I have used varied learning activities and I have motivated students'; COL = 'I have been conscious of differences in the cultural background of my internship tutor and other tutors. I have been open to their advice'; REF = 'I have asked for advice from others to support my development. I have reflected critically on my learning process'.

To evaluate the impact of ICTs on learning in terms of knowledge construction and cognitive improvement among students, we used Tumino and Bournissen's (2019)

bifactorial scale, which includes a learning factor (items 1, 2, 4, 8, 10, 12, 13 and 14) and a learning strategies factor (items 3, 5, 6, 7, 9, 11, 17, 18, 19 and 20), using the Varimax rotation. Kaiser-Meyer-Olkin = .946 and Bartlett's test of sphericity p < .05, showing the suitability of the sample for analysis. Cronbach's alpha coefficient = .9 for both factors. Response options are on a Likert-type scale with five options: 1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, 5 = strongly agree. For example, for the learning factor, the following statement was posed: 'The use of technological tools stimulated greater interest in practices', and for the learning strategies factor: 'The use of ICTs in practices helped my approach to the subject matter'.

To evaluate the students' personality traits, we used the BFI-10 questionnaire (CFI = 1.000; RMSEA [90%] = .000 [.000,.057]) for university students. Rammstedt and John (2007) show that this instrument has high levels of reliability and validity, being adjusted for acquiescence. It evaluates five personality traits, with the following internal consistency: extraversion (E) = .775; agreeableness (A) = .732; conscientiousness (C) = .780; neuroticism (N) = .779; openness (O) = .786. It consists of 10 items (two per factor, one for each pole of the dimension), with two descriptors each. The response options are presented on a Likert-type scale with five choices, ranging from 1 = strongly disagree to 5 = strongly agree. Examples of items per factor include: 'I see myself as someone who is reserved' (E); 'I see myself as someone who is generally confident' (A); 'I see myself as someone who does a thorough job' (C); 'I see myself as someone who relaxes, who copes well with pressure' (N); 'I see myself as someone who has an active imagination' (O).

2.3. Procedure

The questionnaire was sent via email to the MUFPS students at the end of their external placement module. It was completed in a single session, with no time limit. Prior to responding to the questionnaire, students were informed about the aims of the study, guaranteeing the confidentiality of results, and emphasising the voluntary nature of participation. In addition, they were told about the ethical standards of the study through an informed consent form, adhering to the ethical principles of the Declaration of Helsinki (2015).

2.4. Data analysis

SPSS version 26.0 (2019) was used to carry out the data analysis for the descriptive statistics, and Pearson correlations to determine which personality traits could be mediators in the models. Twelve mediation models were tested using the personality variables that showed a significant relationship with the six competence factors. Each of the six mediation models was repeated separately using ICT learning and strategies as predictors.

To maintain statistical strength, without the need to assume multivariate normality in the sample distribution, a bootstrap analysis was carried out to calculate the indirect effects of the mediations (Mallinckrodt et al., 2006).

3. Results

Table 1 shows the results of the Pearson correlation analysis. As can be seen, this shows that the acquisition of teacher competencies is significantly and positively correlated with the impact of ICT learning in both factors. The correlation with the highest value is subject knowledge and methodological competence with ICT learning (r = .574, p = .00) and with ICT learning strategy (r = .631, p = .00). The correlation with the lowest value is competence for collaboration with tutors with ICT learning (r = .421, p = .00) and with ICT learning strategy (r = .438, p = .00). In terms of personality traits, conscientiousness, neuroticism, and openness correlate positively with teacher competencies collectively, while extraversion shows a negative correlation. The highest value is for subject knowledge and methodological competence with conscientiousness (r = .187, p = .00), and the lowest value is for pedagogical competence with extraversion (r = -.140, p = .00). Finally, personality traits such as conscientiousness and openness correlate positively with ICT learning, with conscientiousness having the highest value (r = .184, p = .00) and extraversion the lowest (r = -.162, p = .00). With regard to ICT learning strategy, openness has the highest value (r = .171, p = .00) and neuroticism the lowest (r = .137, p = .00).

Table 1. Results of the correlation analysis.

	1	2	3	4	5	6	7	8	9	10	11	12
1. Learning												
2. Strategies	,890**											
3. Interpersonal	,553**	,609**										
4. Pedagogical	,487**	,572**	,807**									
5. Knowledge	,574**	,631**	,830**	,879**								
6. Organisation	,487**	,563**	,764**	,842**	,886**							
7. Collaboration	,421**	,438**	,487**	,611**	,665**	,699**						
8. Reflection	,535**	,561**	,657**	,713**	,744**	,756**	,708**					
9. Extraversion	-,162*	-,154*	-,140*	-,125	-,161*	-,186**	-,045	-,114				
10. Agreeableness	,026	-,009	,033	,032	,010	,050	,040	,100	,296**			
11. Conscientiousness	,184**	,153*	,096	,173**	,187**	,149*	,241**	,152*	-,368**	-,195**		
12. Neuroticism	,122	,137*	,141*	,173**	,174**	,186**	,155*	,153*	-,385**	-,235**	,470**	
13. Openness	,167**	,171**	,024	,155*	,148*	,149*	,141*	,175**	-,292**	-,106	,570**	,336**

*** p < .001, ** p < .01, * p < .05

A total of 12 mediation models were calculated. For each of the six competency factors, the two ICT factors (learning and strategies) were used as predictors. The mediators were those variables that showed a significant relationship in the previous analysis (Table 1). The only model that showed partial mediation was competence for collaboration with tutors, predicted by ICT learning, mediated by conscientiousness (IC [0.13 – 0.44]) (Table nº 2).

Table 2. Mediation models.

Independent variable	Mediating variable	Dependent variable	Effect of I on M	Effect of M on D	Total effect	Direct effect	Indirect effect	
I	M	D	(a)	(b)	(c)	(c')	Li (c')	Ls (c')
Learning	Extraversion	Interpersonal	-0,22*	-0,98	14,62**	14,85**	-0,22	0,88
	Extraversion		-0,21*	0,59			-0,33	0,75
Strategies		Interpersonal			16,03**	16,33**		
	Neuroticism		0,2	0,87			-0,28	0,77
	Conscientiousness		0,28**	1,02			-0,26	0,98
Learning		Pedagogical			11,83**	12,29**		
	Openness		0,26**	0,64			-0,43	0,82
	Conscientiousness		0,23*	0,81			-0,14	1,23
Strategies	Neuroticism	Pedagogical	0,2	1,22	13,93**	14,40**	-0,19	0,87
	Openness		0,27**	0,12			-0,57	0,63
	Extraversion		-0,22*	-0,76			-0,25	0,84
Learning	Conscientiousness	Knowledge	0,28**	1,01	13,23**	13,72**	-0,23	1,03
	Openness		0,26**	0,07			-0,59	0,57
	Extraversion		-0,21*	0.26***			-0,31	0,67
	Conscientiousness		0,23*	0.21			-0,17	0,9
Strategies		Knowledge			14,62**	15,06**		
	Neuroticism		0,2	0.21			-0,25	0,72
	Openness		0,27**	0.21			-0,68	0,39
	Extraversion		-0,22*	-1,67			-0,1	1,19
Learning	Conscientiousness	Organisation	0,28**	0,08	11,24**	11,81**	-0,58	0,7
	Openness		0,26**	0,61			-0,45	0,73
	Extraversion		-0,21*	-1,19			-0,19	0,97
	Conscientiousness		0,23*	-0,6			-0,54	0,53
Strategies		Organisation			13,07**	13,63**		
	Neuroticism		0,2	1,39			-0,12	0,86
	Openness		0,27**	0,16			-0,53	0,59
	Conscientiousness		0,28**	2,43*			0,13	1,44
Learning		Collaboration			7,95**	8,54*		
	Openness		0,26**	0,66			-0,68	0,28
	Conscientiousness		0,23*	0,16			-0,12	1,05
Strategies	Neuroticism	Collaboration	0,2	0,82	12,11**	12,53**	-0,24	0,7
	Openness		0,27**	0,81			-0,3	0,75
	Conscientiousness		0,28**	0,14			-0,51	0,54
Learning		Reflection			11,60**	11,95**		

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Independent variable	Mediating variable	Dependent variable	Effect of I on M	Effect of M on D	Total effect	Direct effect	Indirect effect	
I	M	D	(a)	(b)	(c)	(c')	Li (c')	Ls (c')
	Openness		0,26**	1,16			-0,19	0,9
	Conscientiousness		0,23*	0,16			-0,47	0,51
Strategies	Neuroticism	Reflection	0,2	0,82	12,11**	12,53**	-0,22	0,68
	Openness		0,27**	0,81			-0,29	0,74

*** p < .001, ** p < .01, * p < .05

4. Conclusión

The acquisition of all teacher competencies correlates significantly and positively with the impact of both components of ICT learning (learning and strategies) in the MUFPS training programme, since ICT learning contributes to knowledge construction and cognitive improvement among students (Balas-Nakash et al., 2010; Tumino and Bournissen, 2019; Riascos-Erazo, Quintero-Calvache and Ávila-Fajardo, 2010). Logically, subject knowledge and methodological competence stands out since this is where the usefulness and ease of use of ICTs is perceived. This perception turns into a positive attitude towards the future incorporation of ICTs in the professional environment (Abarca, 2015; Coscollola and Fuentes, 2010; Edmunds, Thorpe and Conole, 2012; Peinado and Navarro, 2014; Silva, Usart and Lázaro-Cantabrana, 2019).

The analysis of personality traits shows that conscientiousness, neuroticism, and openness correlate positively with teacher competencies collectively, including interpersonal competence, pedagogical competence, subject knowledge and methodological competence, organisational competence, competence for collaboration with tutors and competence for reflection and development, with the highest value being found for subject knowledge and methodological competence with conscientiousness. These are relevant aspects, given that being conscientious or able to control one's impulses, being self-disciplined and highly capable of organisation, being sensitive to threats, having an active imagination, having an aesthetic sensitivity, paying attention to feelings, showing a preference for variety and possessing intellectual curiosity all grant the MUFPS students certain qualities that will allow them to act in a certain way, setting themselves apart from other professionals, suggesting a prosperous future. It is understood that although personality is shaped by temperament, personality traits can be modified through learning (Lamb and Bornstein, 1987).

Forms of learning, the type of professional environment and personality traits all interact and influence one another (Segura, 2022; Zhang, 2004). Hence, discovering and putting into practice the importance of being conscientious and determined, or being sensitive to threats and being open to new experiences, are dimensions that identify the future teacher (Van Dinther et al., 2013; Del Valle and Rodriguez, 2017).

In fact, the behaviour of the future teacher will be the outcome of the interaction between the person and the environment, following Bandura's triadic model (1997). Therefore, it may be said that demonstrating desirable personality traits

to student teachers may be a valuable aspect in the development of teacher competencies in the MUFPS training programme, since it is thanks to personality that a person is able to enact behaviours and to understand the different behaviours of others (Phares, 1996). Furthermore, personality traits such as conscientiousness and openness correlate significantly with ICT learning.

Going deeper into the analysis, of the 12 mediation models, the only one that showed partial mediation was competence for collaboration with tutors, predicted by ICT learning, mediated by conscientiousness, applicable in the sphere of education. The fact that more mediation models were not found may be because correlation is used to analyse the role of some variables that are not always clear (Jiménez et al., 2007). In many studies, personality traits are not always consistent with the variables that they relate to in the field of education. It is possible that the instrument used to analyse personality traits was not suitable and that we need to design a questionnaire that meets the needs of the work sphere. However, it is true that mediation was carried out to find out whether the analysis provided relevant information. Moreover, theoretical models in which a large number of variables are linked are very often contrasted, but frequently without being explicit in terms of the statistical relationships between the variables included (beyond their sign), meaning the mediation effect can be theoretically assumed. This is especially true in pedagogical interventions where, given the difficulties in experimental application, analysis of the relationships between variables can give important suggestions for interventions.

We will continue to study how to relate teacher competencies, ICT learning and personality traits, with the aim of finding a model that responds to the variables that form an excellent and effective teacher. It is only by contrasting the variables involved in the practical context that we can create training programmes for future secondary education, high school, professional training, and language teachers.

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