

# Healthcare students' personality traits and competence-based learning methodologies

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## Abstract

The European Higher Education Area was implemented more than a decade ago with the aim of improving internationally the competitiveness of European university education putting the spotlight on skills and competence development (and not only on knowledge acquisition). This work intends to analyze the impact of competence-based teaching methodologies on university students, as well as to contribute to the study of the individual personality traits differences regarding this impact. For this, a descriptive, quantitative, cross-sectional study was conducted with a non-randomised sample of university students. The sample was composed of a total of 499 students of the University of Huelva (350 from the Health Sciences degree, and 149 from other degrees), who completed a questionnaire on professional skills and teaching methods developed ad hoc for this research, as well as the brief version of the Spanish adaptation of the NEO Five-Factor Inventory. The results show that Health Sciences students feel more satisfied with the most participative and active methodologies, and they consider these better contribute to their future professional competence development. On the other hand, in relation to the big 5 personality traits studied, links have been found between competence development perception and personal preferences and the dimensions of extraversion, agreeableness, conscientiousness and openness to experience. This last factor, openness to experience, appears when analyzing the main differences among both groups, being Health Sciences students more intellectually curious, showing more openness and diversity of interests, in addition to being more creative, innovative, and flexible.

**Abbreviation:** EHEA = European higher education area.

**Keywords:** competence-based education, healthcare students, personality, teaching methods, university

## 1. Introduction

The implementation of the European Higher Education Area (EHEA), derived from the Bologna Declaration,<sup>[1]</sup> implied a step further in the socio-political context of building a Europe based

on knowledge.<sup>[2,3]</sup> In this way, it was intended to respond, inter alia, to the challenges involving social change, technological advances and, in general, the process of globalisation that started years ago, with the aim of improving internationally the competitiveness of European higher education.<sup>[4,5]</sup>

The challenge posed by the incorporation of our country into the EHEA resulted in a substantial change in traditional approaches of Spanish university education, to the extent that the new educational scenario put the spotlight not on teaching, but on learning and the student,<sup>[6]</sup> as well as on skills and competence development (and not only on knowledge acquisition), through the implementation of active teaching methodologies.<sup>[7,8]</sup> All this without forgetting that the competence approach and the use of active methodologies also entailed a rethinking of the assessment process towards procedures that reflect students' learning more effectively.<sup>[9]</sup>

According to Fernández et al,<sup>[10]</sup> one of the main goals of universities in the 21st century, in the context of renewal and change undertaken a few years ago, is for students to acquire training that ensures their adjustment to the knowledge society, preparing them to deal with the real challenges of contemporary life. In short, the ideal is that they acquire useful skills for inside and outside the classroom. That is why competence development is emphasised in university education and why many authors have defended its importance in higher education, as well as the need to properly plan, develop and evaluate these competences so that students acquire a true comprehensive training.<sup>[11,12]</sup>

From an educational perspective, much of the conceptualisations about the term 'competence' have focused on the level of training, knowledge, skills, attitudes, capacities, and abilities that

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people have and master or should master.<sup>[13]</sup> The effective implementation of the EHEA must provide a university training where competencies are harmoniously integrated (general or transversal, and specific), enabling a suitable professional orientation that allows an effective integration into the labour market for the graduates.<sup>[14,15]</sup>

On the other hand, the design of training programmes based on professional competence development was also linked to a change in the teaching-learning model (and in its assessment), thus affecting the different teaching methodologies that both professors and students had to put in place. Regarding the professors, it was necessary for them to apply more active methodologies that allowed the acquisition of these competencies, understanding that the professor needs to change his/her role of mere knowledge transmitter to act more as a counsellor and dynamizing agent of the learning process. For their part, students should no longer focus exclusively on receiving, acquiring and assimilating knowledge, but must take a more active and autonomous role instead, acting as promoters of their own lifelong learning.<sup>[16]</sup> All the above said has resulted in a teaching model that has been imposed in recent years and which basically involves reducing master classes and combining them with the development of other more active methodologies that encourage the students' performance (inside and outside the classroom). This process is made through autonomous learning, but at the same time participative and team-based,<sup>[17]</sup> ie, more oriented to skills and attitudes development than to the knowledge domain. In short, students, besides acquiring knowledge, must learn to work as a team, be autonomous, make decisions, be reflective, and so on.<sup>[18]</sup>

Of the different teaching methodologies, after more than a decade since the beginning of the European convergence process, there seems to be no definitive findings regarding their effectiveness in the sense that they all have advantages and disadvantages. Authors such as Zabalza<sup>[19]</sup> consider that each method performs some functions or phases of the teaching-learning process better than others. The methods will be more or less functional depending on the characteristics of the discipline itself, the nature and style of the intended work, the proposed training objectives, the working group and, above all, the specific target competencies. However, for this author,<sup>[19]</sup> the best teaching methodology, whatever final form it adopts, must be mixed, that is, it must contain 3 basic elements: master class, team work, and student's individual work.

From the above, we can say that 2 elements have gained special relevance in this new teaching-learning process. On the 1 hand, the competition approach, and on the other, a teaching methodology focused on competence development. However, from a psychological point of view, it is also interesting to study the individual differences within the teaching-learning process in higher education, and more specifically the possible mediating role that certain personal (cognitive and personality) traits could play in this process.<sup>[20]</sup>

Among the cognitive characteristics, variables such as intelligence and creativity have traditionally been the subject of attention, and the study of learning styles stands out as the main element of interest in this area.<sup>[21-23]</sup> However, the study of the role played by personality structural characteristics in the teaching-learning process, such as personality traits, has aroused less interest. In this case, existing studies have mainly focused on the relationship of these variables with academic performance,<sup>[24-26]</sup> motivation,<sup>[27]</sup> studying strategies,<sup>[28]</sup> or even with the mentioned learning styles<sup>[29,30]</sup> as well as with the presence of

differential personality traits associated with students of different degrees.<sup>[31]</sup>

Health professionals face daily situations of great emotional intensity and they need to be prepared to address them in an effective and safe way for both the patients and the professionals. In this sense, personality traits are a valuable resource since they have been positively associated with healthcare professionals' coping styles.<sup>[32]</sup> Health professionals' ability to empathise is also conditioned by personality traits, as they are a predictive value for compassion fatigue in the case of those professionals working in long-term hospitalization centres, who are continuously exposed to the suffering of patients.<sup>[33]</sup> Nurses are a particularly vulnerable group as they are exposed to burnout and depression due to the emotional burden of their work. In these situations, nurses' personality influences the expression of symptoms of depression.<sup>[34]</sup>

In health professions, personality traits have been associated with burnout,<sup>[35,36]</sup> patients' satisfaction,<sup>[37]</sup> team working skills,<sup>[38]</sup> the effectiveness of health professionals in post-traumatic syndrome,<sup>[39]</sup> and with compassionate care.<sup>[40]</sup> Therefore, the students' personality traits must be considered for the acquisition of professional skills during their training.

This paper aims to analyse and compare the personality traits of 2 groups of students (Health Sciences students and students from other non-health related degrees), as well as to identify possible links between the students' personality traits and the main teaching methods (master class, team work, and individual work), both as regards the degree of satisfaction or preference shown as in terms of the perception of effectiveness attributed to each of them in the development of academic-professional skills.

## 2. Methods

This is a descriptive, quantitative, cross-sectional study carried out on a non-randomised sample of university students.

### 2.1. Sample

The sample consisted of a total of 499 students enrolled at the University of Huelva during the 2017/2018 school year. Although the sample selection was not random, but incidental, it was sought to represent university degrees of different branches. In this case, the chosen branches were health sciences, social and legal sciences, and engineering and architecture, and the student selection was from all courses, from first to fourth.

### 2.2. Instruments

All the participants of this study completed the following assessment instruments:

- (1) Socio-demographic data protocol: Prepared ad hoc for this research. It collected data about the following variables: age, sex, degree, and course.
- (2) Questionnaire on professional competencies and teaching methods: Also specifically elaborated for this work, it is made up of a total of 33 elements with Likert-type answer format going from 0 (nothing) to 10 (a lot). It evaluates the student's perception of the effectiveness of each of the 3 basic teaching methods (master class, team work, and individual work) in professional competence development. The questionnaire, in turn, includes 2 subscales: the professional competence promotion scale, consisting of 26 items that cover the extent

to which the 3 teaching methodologies enable the professional competence acquisition, with scores ranging from 0 to 260, and the satisfaction scale, which includes the rest of elements (7 items), and offers information about the students' personal satisfaction degree in relation to each of these methods, ranging, in this case, from 0 to 70.

- (3) **Neo 5-Factor Inventory:** This is the short version of the Spanish adaptation 'Inventario de Personalidad NEO-Revisado'.<sup>[41]</sup> Composed of 60 items with a Likert-type answer format of 5 options (from "totally disagree" to "totally agree"), it evaluates the 5 basic personality traits considered in the 5-Factor Model of Personality<sup>[42]</sup>: Neuroticism, Extraversion, Openness to experience, Agreeableness, and Conscientiousness. These factors encompass several analysis levels and allude to different behavioural aspects: the Extraversion and Agreeableness dimensions are fundamentally of interpersonal nature; Conscientiousness mainly focuses on the tasks, and Neuroticism and Openness to experience are respectively related to the emotional and cognitive experiences of a person. With adequate reliability indexes, both in the original American population<sup>[42]</sup> and in its adaptations to other languages,<sup>[41,43,44]</sup> the Cronbach's alpha coefficients obtained in this sample ranged from 0.71 to 0.80.

### 2.3. Procedure

First, in order to carry out this study, the questionnaire on professional competence and teaching methodology development was created. These competencies were selected from the main generic or transversal competencies collected in the white papers of the different degrees,<sup>[45,46]</sup> as well as from the curricula of different Spanish qualifications.<sup>[47]</sup> Subsequently, the questionnaires used in this study were administered. To this end, the professors who voluntarily wanted to participate in the study were contacted. The assessment instruments were always administered during their teaching hours and as long as they had used the 3 teaching methods in their respective subjects. The administration was carried out in the same teaching place each group had as the habitual teaching classroom.

### 2.4. Data analysis

Data analysis was carried out with the software package SPSS 22 Statistics. The internal consistency of the administered assessment instruments was estimated by obtaining the Cronbach  $\alpha$  coefficient of reliability. Descriptive analyses were obtained, with statistics of central tendency and of dispersion for the continuous variables, as well as frequencies and percentages for the categorical variables. For the comparison analyzes, the Kolmogorov-Smirnov test was conducted to check the normality of the variables, as well as the Student  $t$  test for related samples. ANOVA was used with 1 of the factors for the means comparison, and correlations were included to estimate the association between the metric variables.

### 2.5. Compliance with ethical standards

This study has been approved by the Labour Sciences School Ethics Committee of the University of Huelva (Spain). The assisting students that day were informed in a paper form of the aims of the study and were asked to participate in it. Those

who voluntarily agreed to participate signed the corresponding written consent, where they were guaranteed the anonymity and confidentiality of their data, as well as its exclusive use for research purposes.

## 3. Results

The sample presented sociodemographic characteristics regarding the students' sex that were representative of the current university population, mostly female (385 women and 114 men), with ages between 18 and 48 years (mean=22.21; standard deviation = 3.72). The sample was composed of students belonging to the following degrees: 257 from Psychology, 93 from Nursing, 79 Primary Education students, 54 students of different Engineering degrees, and 16 Labour Relations and Human Resources students. Regarding the course, they were mainly enrolled in their second (57.1%) and fourth (32.7%) year. In order to address the specific objectives of this work, the participants were categorised into 2 groups: health sciences students ( $N=350$ ) and students from non-health related degrees ( $N=149$ ).

As for the validity and reliability of the Questionnaire on professional competencies and teaching methods, its structure underwent experts' evaluation, and these obtained a high degree of agreement (Cohen kappa = 0.84) in terms of its subdimensions. Additionally, internal consistency was estimated through the Cronbach alpha. Appropriate coefficients for the students' opinion were obtained for the degree to which they consider that each teaching method encourages the acquisition of professional competencies was registered ( $\alpha=0.947$  for the master class,  $\alpha=0.891$  in the case of team work, and  $\alpha=0.906$  for individual work). Regarding students' satisfaction with each teaching methodology, the values obtained were  $\alpha=0.879$ ,  $\alpha=0.721$ , and  $\alpha=0.810$ , respectively.

In relation to the results obtained in this work, in Table 1 we can see, first, the descriptive statistics and statistical dispersion (ranges, minimum and maximum values, means, and standard deviations) of the variables examined in the study. Likewise, Figures 1 and 2 provide information on the degree of dispersion of the data for the different teaching methodologies, both regarding the development of professional competence and students' satisfaction with the methods. As shown in the Table 1, students perceive that team work is the most contributing methodology to competence development (mean=205.11; SD=26.25), while the master class is perceived as the 1 that promotes this development to a lesser extent (mean=178.26; SD=37.39).

Then, the contrasts of means were performed, showing statistically significant differences in all cases: master class-team work ( $t=-14.64$ ;  $P=.000$ ), master class-individual work ( $t=-10.49$ ;  $P=.000$ ), and team work-individual work ( $t=-6.75$ ;  $P=.000$ ). As to the degree of satisfaction with the different methodologies, in this case, the students in general showed greater satisfaction with the individual work (mean=56.17; SD=8.28), and the master class received lower values (mean=47.50; SD=12.61). As in the previous case, once the corresponding contrasts of means had been made, statistically significant differences were also obtained in all the comparisons: master class-team work ( $t=-11.25$ ;  $P=.000$ ), master class-individual work ( $t=-10.49$ ;  $P=.000$ ), and team work-individual work ( $t=2.91$ ;  $P=.004$ ).

On the other hand, once the participants were grouped according to the degree they were enrolled in (Health Sciences

**Table 1**  
Descriptive statistics and statistics of dispersion of the study variables.

Variables	Range	Minimum	Maximum	Mean	SD
Competences development perception					
Master class	227	33	260	178.26	37.39
Team work	127	130	257	205.11	26.25
Individual work	155	105	260	196.14	29.38
Degree of satisfaction					
Master class	65	5	70	47.50	12.61
Team work	51	19	70	54.82	10.14
Individual work	43	27	70	56.17	8.28
Neuroticism	39	5	44	22.94	7.41
Extraversion	41	7	48	32.07	6.96
Openness to experience	39	9	48	28.73	7.27
Agreeableness	32	11	43	29.47	5.72
Conscientiousness	35	9	44	30.21	5.46

Source: self-made.  
SD = standard deviation.

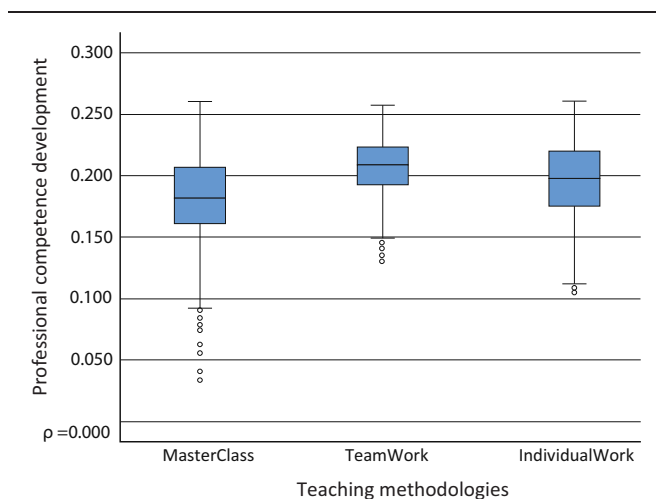
students, on the 1 hand, and students from other degrees, on the other), Table 2 is the results obtained in terms of the perception of competence development associated to each teaching method, as well as the degree of satisfaction with the methodologies. As can be seen in this table, both Health Sciences students and the rest consider that teamwork is the teaching methodology that most encourages the development of professional competence, while the master lesson is the 1 that least favours this development. However, after carrying out the corresponding comparative analysis, the results indicate the existence of statistically significant differences in the perception of both groups of students as regards the development of professional competence encouraged by the 3 teaching methods: master lesson ( $t=3.995$ ;  $P=.000$ ), team work ( $t=-2.467$ ;  $P=.014$ ), and autonomous work ( $t=-2.359$ ;  $P=.019$ ).

In relation to the degree of satisfaction with each methodology, while Health Sciences students value autonomous work more positively, students from non-health related degrees are more satisfied with team work. After conducting the corresponding comparative analysis, the results indicate the existence of

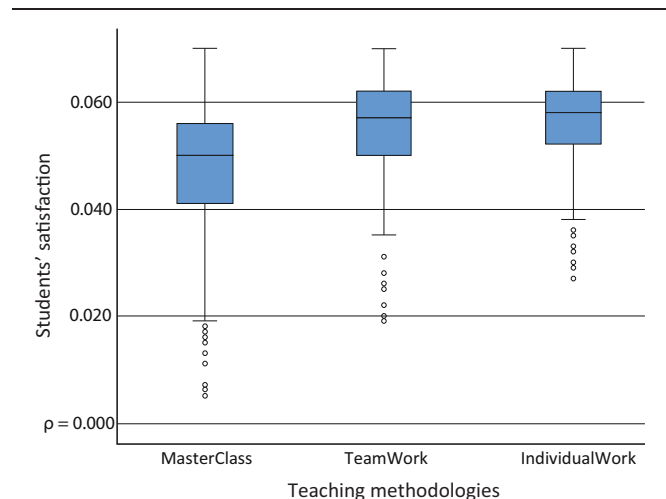
statistically significant differences in the satisfaction shown by both groups of students regarding the master lesson ( $t=4.419$ ;  $P=.000$ ), more significantly valued by Health Sciences students, and team work ( $t=-2.405$ ;  $P=.017$ ), with which students from non-health related degrees are most satisfied.

On the other hand, in relation to the role of the possible differences on personality traits between Health Sciences students and those from non-health related degrees, Table 3 shows the descriptive statistics obtained from the 5 major traits, as well as the results from the corresponding comparative analysis (student  $t$ ). As can be seen, 4 of the 5 personality traits do not show significant differences between both groups. Only with regard to Openness to experience, where Health Sciences degrees students obtain higher scores, this difference achieves statistical significance ( $t=3.02$ ;  $P=.002$ ).

On the other hand, following the objectives of this work, in terms of the relationship between the personality dimensions or traits and the students' perception of how each methodology develops or promotes their professional competences, the corresponding Pearson correlation analyses are collected in



**Figure 1.** Boxplot showing the perception of professional competence development by the different teaching methodologies.



**Figure 2.** Boxplot showing students' satisfaction with the different methodologies.

**Table 2**

**Descriptive statistics of the perception of professional competences development and degree of satisfaction with the teaching methodologies, among Health Sciences students and students from other degrees.**

	Competence development perception						Degree of satisfaction					
	Master		Team		Individual		Master		Team		Individual	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Healthcare students	183.15	33.21	203.23	25.90	194.14	29.68	49.29	11.61	54.08	10.46	56.29	8.42
Others	166.33	44.37	209.71	26.76	201.15	27.95	43.35	13.97	56.53	9.16	55.83	7.99

Source: self-made.

SD = standard deviation.

**Table 3**

**Personality traits according to the degree (Health Sciences students and from other degrees), Descriptives and Student *t* distribution.**

	Health Sciences		Other degrees		<i>t</i>	<i>P</i>
	M	SD	M	SD		
Neuroticism	22.99	7.59	22.74	7.00	0.33	.736
Extraversion	32.01	7.21	32.29	6.39	-0.40	.685
Openness to experience	29.36	7.46	27.20	6.67	3.02	.002**
Agreeableness	29.29	5.72	30.04	5.68	-1.31	.190
Conscientiousness	30.00	5.49	30.80	5.34	-1.48	.137

\*\*  $P < .01$ ; Source: self-made.

Table 4 (Health Sciences students). As can be seen in this table, positive and significant correlations between Extraversion and Agreeableness and team work ( $r=0.320$  and  $r=0.257$ , respectively) were found, as well as between Conscientiousness and individual work ( $r=0.317$ ); regarding Master Classes, a negative association is found with Openness to experience ( $r=0.204$ ;  $P < .05$ ), and a positive 1 with responsibility ( $r=0.216$ ;  $P < .05$ ). In this way, the higher the students score on Extraversion and Agreeableness, the greater their perception that team work fosters competence development, while higher values in Conscientiousness are associated with a greater perception of how individual work contributes to their development. On the contrary, higher values in Openness to experience and, thus, intellectual curiosity, bring about lower values in the conception that Master classes foster professional competence development.

For its part, Table 4 also include the corresponding correlation coefficients between personality traits and the degree of satisfaction that students Health Sciences students manifest with each teaching methodology, obtaining, in this case, the same associations as in the previous variable. In this sense, higher scores on extraversion ( $r=0.202$ ;  $P < .05$ ) and agreeableness ( $r=0.320$ ;  $P < .01$ ) correspond with greater satisfaction with team work. Thus, greater satisfaction with autonomous work and

learning is associated with high scores in responsibility ( $r=0.317$ ;  $P < .01$ ) and, on its part, high scores in responsibility ( $r=0.270$ ;  $P < .05$ ) and low scores in openness to experience ( $r=-0.290$ ;  $P < .05$ ) correspond with higher values in the master class as a teaching method Table 5.

#### 4. Discussion

The findings from this study show the impact of competence-based teaching methodologies on university students that will contribute to the study of the individual differences of personality traits regarding this impact, once a decade has elapsed since the implementation of the EHEA.

The adaptation to the EHEA meant a transformation of university studies in terms of their formulation in Spain, and at the same time led to a debate on the teaching-learning process. The new degrees adapted to the EHEA should be an opportunity to improve both the quality of teaching and learning and students' performance and satisfaction.<sup>[48]</sup> In the context of a changing society that was continually forced to reformulate its demands and that aimed at professionalising university education by bringing universities closer to society and to the working world, a common European educational system was set up. This

**Table 4**

**Correlations between the big five personality traits, the perception of professional competence development, and the degree of satisfaction with the teaching method among Health Sciences students.**

	Competence development perception			Degree of satisfaction		
	Master class	Team work	Autonom. work	Master class	Team work	Autonom. work
Neuroticism	-0.001	-0.062	-0.025	-0.086	-0.051	0.021
Extraversion	0.073	0.320**	0.087	0.097	0.202*	0.182
Openness	-0.204*	0.062	0.001	-0.290*	0.032	0.048
Agreeableness	0.124	0.257*	0.035	-0.021	0.320**	0.161
Conscientiousness	0.216*	0.129	0.317**	0.270*	0.015	0.317**

\*  $P < .05$ .

\*\*  $P < .01$ ; Source: self-made.



**Table 5**

**Correlations between the big five personality traits, the perception of professional competence development, and the degree of satisfaction with the teaching method among students from non-health related degrees.**

	Competence development perception			Degree of satisfaction		
	Master class	Team work	Autonom. work	Master class	Team work	Autonom. work
Neuroticism	-0.043	-0.007	-0.038	-0.025	0.016	-0.056
Extraversion	0.161	0.166*	0.130*	0.103	0.301**	0.148*
Openness	0.089	0.075	0.055	0.095	0.097	0.050
Agreeableness	0.106	0.118	0.084	0.066	0.147*	0.038
Conscientiousness	0.071	0.055	0.101	0.092	0.053	0.315**

\*  $P < .05$ .

\*\*  $P < .01$ ; Source: self-made.

aimed at competence-based training, including transversal competencies, and was expected to be closely linked to the current markets' social and labour demands,<sup>[49]</sup> with the objective of creating a real university education-labour market demand binomial.<sup>[50]</sup>

Now that new qualifications are already sufficiently implemented, many of them accredited and others in the process of accreditation, this work focuses, precisely, on the transversal competencies and Health Sciences students' perception as compared to students from other fields of knowledge of the teaching methodologies, both in relation to their personal satisfaction (considering that satisfaction with the learning process is part of its result and, therefore, needs to be taken into account) and to the methodologies' contribution to competence acquisition. In this sense, although university professors (in Spain) continue to use the master class as their main methodology for the transmission of knowledge,<sup>[18]</sup> the main results of this study show that, in both groups of students, it is the least satisfying method of all, at the same time that a significantly lesser contribution to the development or promotion of academic-professional competencies is attributed to the master class. On the contrary, the most active methodologies (team work and individual work) show a greater degree of satisfaction and are considered to promote professional competencies more extensively, respectively. Therefore, both groups of students are more comfortable with methodologies that enrich their learning, as it is developed in a more active collaborative and/or autonomous way (Health Sciences students show more satisfaction with this last method, and the rest of students, with team work) even though there is some evidence against this fact.<sup>[51]</sup> At the same time, for both groups of students these more active methodologies (specifically team work or collaborative tasks), against the more traditional ones such as the master class, as the methods that further encourage the development of academic-professional competencies. As for Health Sciences students, 1 of the key professional competences within the healthcare clinical field is the capacity for interdisciplinary work. This is undoubtedly seen in these students when it comes to assess the team work methodology as 1 that contributes to the future development of professional competence in a greater degree.

On the other hand, once the corresponding comparative analyzes are carried out, the results indicate the existence of significant differences in the studied variables (degree of satisfaction with the methods and competence development perception) depending on whether the students' are enrolled in Health Sciences degrees. In this sense, as regards to the perception of professional competence development, although, as was

described above, team work is considered as the methodology that contributes to a greater extent in both groups of students, Health Sciences students give a higher value to the master class than students from non-health related degrees, as well as significantly lower values to autonomous work and collaborative tasks regarding their contribution to professional competence development. Probably, the teaching methods applied throughout the development of their qualification are having an influence in this perception, as social sciences and education degrees make a greater use of more active, dynamic, and participative methodologies. On the contrary, health-related degrees tend to apply lectures as a method, such as the master class.<sup>[52]</sup>

When dealing with the degree of personal satisfaction manifested with each method, differences are also found between both groups. In this sense, Health Sciences (Psychology and Nursing) students are the ones who show more satisfaction with individual work, while those of Social and Legal Sciences are more satisfied with team work. These results probably reveal particularities related to the specific qualification and its own teaching idiosyncrasy, and at the same time this probably manifests, in the case of Health Sciences students, preferences related to both the development of their future professional performance and to interests linked to their own personality traits. In this sense, although these students assess team work as a professional competence promoter, they claim to feel more satisfied with autonomous learning, a methodology that allows more psychological independence and flexibility. Therefore, it seems that, in recent years, the Spanish universities' effort to prepare students for their autonomous performance in a way that they can self-manage their own learning process is also coupled with a higher assessment on the part of the students.

On the other hand, within this context of change experienced by the university field in recent years, we must also recognize and investigate the possible modulatory role that individual differences can exert in the teaching-learning process. In this line, the concept of work arises in the sense of concretely exploring structural dimensions of personality (traits) and their relation with the variables object of study.

In this regard, and in relation to the score obtained in the 5 major personality traits from Health Sciences students and those from non-health related degrees, the results of this study (Table 3) indicate the existence of statistically significant differences only in 1 factor: Openness to experience. This result leads to the conclusion that, as compared to the other students, who are characterised by being more conventional in their behaviour and preferring what they are familiarised with to the novelty, Health Sciences students have a personality profile where creativity,

preference for variety, intellectual curiosity, independence of judgment, and tolerance are highlighted.

Focusing on the obtained results in relation to the perception of Health Sciences students on the acquisition of professional competencies, as well as on the degree of satisfaction with them (Table 4), there are positive correlations, albeit quite modest in some cases, between the personality dimensions Extraversion, Agreeableness and Conscientiousness for both variables, as well as Openness to experience (in this case, with a negative association).

In the case of team work, the relationships (positive in all cases) appear with Extraversion and Agreeableness; autonomous work is related to responsibility; and, finally, master classes are positively related with responsibility, and negatively related with openness to experience.

According to these results obtained from Health Sciences students, we can say that, in general, a higher score in extraversion facilitates the perception of professional competence development by team work, a perception that also corresponds with a higher level of satisfaction. These results can be explained by the very characteristics exhibited by people with high scores in extraversion. Although the instrument used for the evaluation of the big 5 factors does not allow the extraction of detailed information on the different components or domains that each of them covers, it can be generally said that, in this association, greater positive emotionality, optimism, and subjective well-being characterises the most extraverted people, as well as greater commitment with the social environment, mainly due to the generation of vital experiences facilitated by extraversion's sociability component. With regard to team work, it mainly deals with naturally implicit skills, especially when adding the leadership and dominance ability that characterises extraverted people.

Together with Extraversion, the other personality trait that encompasses the range of interpersonal relations is Agreeableness. Extraversion refers to the quantity and intensity of these relations, while Agreeableness refers, to a greater extent, to the quality with which these relations are established. In this case, the students with higher scores in this factor show a higher level of satisfaction with team work, while considering that this is the methodology that further encourages professional competence development. It is evident that team work requires a series of skills that facilitate its development, characteristics that are usually present in people with high scores in Agreeableness. In this sense, these are people with a great capacity for establishing affective bonds, who usually put their trust in others, and who are cooperative (more than competitive) and collaborative towards obtaining a common goal. At the same time, these people are sensitive to the problems or needs of others and do not hesitate to put in place helpful behaviours in a selfless way when necessary, characteristics that will undoubtedly manifest in the future as an important part of their care tasks, and which are reflected in greater associations made by these students. As with the Extraversion factor, we consider that the result coincidence between both variables (perception of professional competence development and degree of satisfaction) is due to the fact that students tend to perceive as a method that enhances the acquisition of academic and professional competencies in a greater measure the 1 with which he/she feels more personally identified and comfortable. In short, taking into account the 5 C's that define the characteristics of good team of work: communication, cooperation, complementarity, confidence and commit-

ment, we can see how they keep a close relationship with the 2 personality factors or traits that we have been referring to: extraversion and agreeableness.

Conscientiousness is another factor with which associations appear, in this case, with autonomous learning and master class. In relation to this dimension, this is certainly the personality trait most consistently linked to educational contexts, especially in terms of academic performance.<sup>[26,30,53]</sup> Individual work denotes many of the characteristics of people with high Conscientiousness scores, such as self-regulation skills (fundamental to goal-oriented behavior), planning capacity, impulse control and commitment to norms, as well as effort and persistence capacity. In this sense, 1 of the fundamental objectives of the EHEA, self-directed learning, deserves a clear reference within this personality trait. A self-directed student is 1 who, at a personal level, trusts in his/her own capacities and shows initiative, independence and persistence in the learning process. These students conceptualise learning as a challenge, are able to define their own goals, organise their time, strategically plan their learning, and perceive themselves as responsible for their achievements. As for the association between responsibility and master class, this may be influenced by the sense of duty responsible people have, manifested in the need for regular attendance to classes this teaching methodology implies. This characteristic shows an association in the case of Health Sciences students, and which is not present in students from other degrees.

Finally, as a characteristic and defining result obtained in Health Sciences students, we find the associations between openness to experience and perception of professional competence development with the degree of satisfaction with the master lesson. As seen above, from the 5 major personality traits, Openness to experience was the only 1 in which the personality profiles of both groups of students differed; these differences again manifest regarding this teaching method. In this sense, while in students from non-health related degrees, competences and satisfaction with this method is only linked with high scores in responsibility, in the case of Health Sciences students, this can also be seen with lower scores in openness to experience, that is, the most responsible but less creative students, more traditional and with less intellectual curiosity, are those who are most satisfied with this method.

Finally, it is possible to state that the main limitations of this research derive from the utilization of incidental sampling, not random, and referring to a single university, a circumstance that limits the representativeness of the sample. Hence, for future research, it would be advisable to carry out a random, cluster sampling to guarantee the generalisation of the obtained results as they would represent at university, as well as the corresponding courses and, as far as possible, in different university centres. This would make it possible, among other issues, to carry out factorial variance analyses, as well as structural models, that would allow to determine the joint interaction of variables.

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## References

- European Ministers of Education. The Bologna Declaration of 19 June 1999: Joint declaration of the European Ministers of Education. Bologna: The European Higher Education Area; 1999. Available at: <http://www.eees.es/>.
- Aránguiz C, Rivera P. Competencias transversales en los planes de estudio de las titulaciones de grado: los esfuerzos de Bolonia en calidad universitaria. *Encuentros* 2012;2:61–72.
- Drucker PF. Managing Oneself. *Harvard Business Review*. 2005;77:65–74,185. Available at: <https://hbr.org/2005/01/managing-oneself>
- Ariza T, Quevedo-Blasco R, Bermúdez MP, et al. Analysis of postgraduate programs in the EHEA and the USA. *Revista de Psicodidáctica* 2013;18:197–219.
- Rodrigo M, Almirón N. Autopercepción de la adquisición de competencias de los estudiantes de periodismo: el caso de la Universitat Pompeu Fabra. *Aula abierta* 2013;41:99–110.
- Zabalza-Beraza MA. La convergencia como oportunidad para mejorar la docencia universitaria. *Revista Interuniversitaria de Formación del Profesorado* 2006;20:37–69.
- Ibarra-Sáiz MS, Rodríguez-Gómez G. Aprendizaje autónomo y trabajo en equipo: reflexiones desde la competencia percibida por los estudiantes universitarios. *Revista Electrónica Universitaria de Formación del Profesorado* 2011;14:73–85.
- Rodríguez-Gómez G, Ibarra-Sáiz MS, Cubero-Ibáñez J. Competencias básicas relacionadas con la evaluación. Un estudio sobre la percepción de los estudiantes universitarios. *Educación XXI* 2018;21:181–208.
- Gallego JL, Rodríguez A. Confiabilidad de las valoraciones de los estudiantes. Estudio de sus competencias evaluativas *Revista de Docencia Universitaria, REDU* 2017;15:349–66.
- Fernández E, Bernardo A, Suárez N, et al. Predicción del uso de estrategias de autorregulación en la educación superior: Un análisis a nivel individual y de contexto. *Anales de Psicología* 2013;29:865–75.
- Blanco A (coord.). Desarrollo y evaluación de competencias en Educación Superior. Madrid: Narcea; 2009. Available at: <https://recyt.fecyt.es/index.php/BORDON/article/view/28821>
- Cano-García ME. La evaluación por competencias en la Educación Superior. Profesorado, *Revista de Currículum y Formación del Profesorado* 2008;12. Available at: <http://www.ugr.es/~recfpro/rev123COL1.pdf>
- Muñoz-Cantero J, Rebollo N, Espineira-Bellón EM. Percepción de competencias en el EEES: análisis en el Grado de Educación Primaria. *Revista Electrónica Interuniversitaria de Formación del Profesorado* 2014;17:123–39.
- Comisión Europea/EACEA/EURYDICE. El Espacio Europeo de Educación Superior en 2015: Informe sobre la implantación del Proceso de Bolonia. Luxemburgo: Oficina de Publicaciones de la Unión Europea. 2015. doi: 10.2797/770328.
- Ministry of Education, Culture and Sports. La integración del sistema universitario en el Espacio Europeo de Educación Superior. Documento-Marco. Madrid: MEC. 2003. Available at: [http://www.eees.es/pdf/Documento-Marco\\_10\\_Febrero.pdf](http://www.eees.es/pdf/Documento-Marco_10_Febrero.pdf)
- Montero M. El proceso de Bolonia y las nuevas competencias. *Tejuelo* 2010;9:19–37.
- Márquez E, Jiménez-Rodrigo ML. El aprendizaje por proyectos en espacios virtuales: estudio de caso de una experiencia docente universitaria. *Revista de Universidad y Sociedad del Conocimiento (RUSC)* 2014;11:76–90.
- Cámara-Estrella A, Díaz-Pareja EM, Ortega-Tudela JM. Desarrollo de competencias de aprendizaje en alumnos universitarios. *REDU, Revista de Docencia Universitaria* 2015;13:233–48.
- Zabalza-Beraza MA. Metodología docente REDU. *Revista de Docencia Universitaria* 2011;9:75–98.
- Carey J, Barthelmeh M. Teaching Approaches and Student Learning: Personality type and design studio. *Land Environment and People Research Report*, 42. Christchurch: Lincoln University, NZ. Available at: <https://core.ac.uk/download/pdf/80827972.pdf>
- Cuevas J. Is learning styles-based instruction effective? A comprehensive analysis of recent research on learning styles. *Theory and Research in Education* 2015;13:308–33.
- Pashler H, McDaniel M, Rohrer D, et al. Learning styles: concepts and evidence. *Psychol Sci Public Interest* 2008;9:105–19.
- Willingham DT, Hughes EM, Dobolyi DG. The scientific status of learning styles theories. *Teaching of Psychology* 2015;42:266–71.
- Mitrofan N, Ion A. Predictors of academic performance. The relation between the big five factors and academic performance. *Procedia: Social and Behavioral Sciences* 2013;78:125–9.
- Poropat AE. A meta-analysis of the five-factor model of personality and academic performance. *Psychol Bull* 2009;135:322–38.
- Richardson M, Abraham C, Bond R. Psychological correlates of university students' academic performance: a systematic review and meta-analysis. *Psychol Bull* 2012;138:353–87.
- 2011;Komarraju M, Karau SJ, Schmeck RR, et al. The big five personality traits, learning styles, and academic achievement personality and individual differences. 51:472–7.
- Kokkinos CM, Kargiotidis A, Markos A. The relationship between learning and study strategies and big five personality traits among junior university student teachers. *Learning and Individual Differences* 2015;43:39–47.
- Chamorro-Premuzic T, Furnham A. Mainly openness: the relationship between the big five personality traits and learning approaches. *Learning and Individual Differences* 2009;19:524–9.
- Torres-Acosta ND, Rodríguez-Gómez J, Acosta-Vargas M. Personalidad, aprendizaje y rendimiento académico en medicina. *Investigación en Educación Médica* 2013;2:193–201.
- Vedel A. Big five personality group differences across academic majors: a systematic review. *Personality and Individual Differences* 2016;92:1–0.
- Fornés-Vives J, García-Banda G, Frias-Navarro D, et al. Longitudinal study predicting Burnout in Spanish nurses: the role of neuroticism and emotional coping. *Personality and Individual Differences* 2019;138: 286–91.
- Gallardo R, Rohde D. Personality predictors of compassion fatigue in long-term care environments. *North American Journal of Psychology* 2018;20:481–94.
- Duan-Porter W, Hatch D, Pendergast JF, et al. 12-month trajectories of depressive symptoms among nurses—Contribution of personality, job characteristics, coping, and burnout. *J Affect Disord* 2018;234:76–3.
- Chien-Huai C, Pei-Chi T, Chun-Yu L, et al. Burnout in the intensive care unit professionals: a systematic review. *Medicine* 2016;95:e5629.
- Simionato GK, Simpson S. Personal risk factors associated with burnout among psychotherapists: a systematic review of the literature. *Journal of Clinical Psychology* 2018;74:1431–56.
- Mármol-López MI, Miguel Montoya I, Montejano Lozoya R, et al. Impacto de las intervenciones enfermeras en la atención a la cronicidad en España. *Revisión sistemática Rev Esp Salud Pública* 2018;92: e201806032.
- Lanz JJ, Gregory PJ, Menendez M, et al. Congeniality: understanding the importance of surgeons' nontechnical skills through 360° feedback. *Journal of Surgical Education* 2018;75:984–92.
- Stevens NR, Ziadni MS, Lillis TA, et al. Perceived lack of training moderates relationship between healthcare providers' personality and sense of efficacy in trauma-informed care. *Anxiety Stress Coping* 2019;32:679–93.
- Flinton D, Cherry P, Thorne R, et al. Compassion satisfaction and fatigue: an investigation into levels being reported by radiotherapy students. *Journal of Radiotherapy in Practice* 2018;17:364–7.
- Costa PT, McCrae RR. Inventario de Personalidad NEO Revisado (NEO-PI-R) e Inventario NEO Reducido de Cinco Factores: Manual Profesional. 3rd Ed. Madrid: TEA Ediciones. 2008.



- [42] Costa PT, McCrae RR. NEO PI-R, Revised Neo Personality Inventory and NEO Five-Factor Inventory (NEO-FFI). Odessa: Psychological Assessment Resources, FL, USA. 1992.
- [43] Cordero A, Pamos A, Seisdedos N, Costa P. Inventario de Personalidad Neo Revisado (NEO-PI-R), Inventario Neo Reducido de Cinco Factores (NEO-FFI): Manual Profesional. Madrid: TEA Ediciones. 1999.
- [44] Meda-Lara RM, Moreno-Jiménez B, García LF, et al. Validez factorial del NEO-FFI en una muestra mexicana: propuesta de una versión reducida. *Revista Mexicana de Psicología* 2015;32:57–67.
- [45] Agencia Nacional de Evaluación de la Calidad: Libros Blancos. [Internet]. Madrid: ANECA. [consulted 02/04/2020]. Available at: <http://www.aneca.es/Documentos-y-publicaciones/Libros-Blancos>
- [46] Agencia Nacional de Evaluación de la Calidad. Guía de apoyo para la elaboración de la memoria de verificación de títulos oficiales universitarios (Grado y Máster). Madrid: ANECA; Unidad de Evaluación de Enseñanzas e Instituciones. 2015. Available at: [http://www.aneca.es/var/media/325330/verifica\\_guia\\_gradoymaster\\_090108.pdf](http://www.aneca.es/var/media/325330/verifica_guia_gradoymaster_090108.pdf).
- [47] Leví-Orta G, Ramos-Méndez E. Componentes de las competencias en los nuevos grados de algunas universidades españolas. *Revista de Educación* 2013;362:623–58.
- [48] López-Núñez MI, Rubio-Valdehita S, Díaz Ramiro EM. Rendimiento, contexto académico y salud percibida en estudiantes de psicología antes y después del EEES. *REDU, Revista de Docencia Universitaria* 2018;16:211–2.
- [49] Michavila F, Martínez JM, Martín-González M, et al. Barómetro de empleabilidad y empleo de los universitarios en España: Primer informe de resultados. Madrid: Observatorio de Empleabilidad y Empleo Universitario. 2015. Available at: [http://catedraunesco.es/repositorio/2016/Informe\\_Bar%C3%B3metro\\_OEEU\\_2015.pdf](http://catedraunesco.es/repositorio/2016/Informe_Bar%C3%B3metro_OEEU_2015.pdf).
- [50] Martínez-Clares P, González-Morga N. Las competencias transversales en la universidad: propiedades psicométricas de un cuestionario. *Educación XX1* 2018;21:231–62.
- [51] Olivera E, Crespo P, Raya JM. El proceso de Bolonia en el área de contabilidad: Efectos sobre la satisfacción de los estudiantes. *Educade: Revista de Educación en Contabilidad, Finanzas y Administración de Empresas* 2013;4:22–33. Available at: <http://www.educade.es/images/pdf/numeros/n4/2.pdf>.
- [52] Elgueta MF, Palma EE. Una propuesta de clasificación de la clase magistral impartida en la Facultad de Derecho. *Revista Chilena de Derecho* 2014;41:907–24.
- [53] Poropat AE. Other-rated personality and academic performance: evidence and implications. *Learning and Individual Differences* 2014;34:24–32.