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RELATIONSHIP BETWEEN PERSONALITY TRAITS AND TRANSVERSAL COMPETENCES OF TEACHERS IN VIRTUAL EDUCATION

Relación entre rasgos de personalidad y competencias transversales de docentes en educación virtual

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ABSTRACT

COVID-19 and technological advancements have increased the importance of virtual higher education globally. Researchers have focused on studying both academic actors and virtual environments to improve student learning outcomes. Teachers' personalities and competencies, shaped by their beliefs and experiences, play a key role in knowledge transfer. The purpose of this study was to identify the relationship between the personality traits and transversal competencies of teachers at a virtual education university in Colombia. This quantitative, descriptive study used a non-probabilistic, convenience sample of 155 teachers. Data was collected using the Big Five personality traits inventory (BFQ-2) and analyzed with descriptive statistics and correlations using JAMOVI 2.6.13. Agreeableness and Openness to Experience were the dominant personality traits. Sociability and Change Management were the key competencies. Most personality factors correlated significantly, except for Extraversion and Neuroticism. Similarly, most personality factors correlated with competencies, with the exception of Extraversion and Emotion Management. These findings offer valuable insights into the complex dynamics of virtual teaching, within the context of technological progress and the lessons learned from the COVID-19.

Palabras clave: Personalidad, Competencias, Educación Virtual, Factores, Rasgos.

RESUMEN

El COVID-19 y los avances tecnológicos han aumentado la importancia de la educación superior virtual a nivel mundial. Los investigadores se han centrado en estudiar tanto los actores académicos como los entornos virtuales para mejorar los resultados del aprendizaje de los estudiantes. Las personalidades y competencias de los docentes, moldeadas por sus creencias y experiencias, desempeñan un papel clave en la transferencia de conocimientos. El propósito de este estudio fue identificar la relación entre los rasgos de personalidad y las competencias transversales de docentes de una universidad de educación virtual en Colombia. Este estudio cuantitativo y descriptivo utilizó una muestra no probabilística por conveniencia de 155 docentes. Los datos se recopilaron utilizando el inventario de rasgos de personalidad de los Cinco Grandes (BFQ-2) y se analizaron con estadísticas descriptivas y correlaciones utilizando JAMOVI 2.6.13. La amabilidad y la apertura a la experiencia fueron los rasgos de personalidad dominantes. La sociabilidad y la gestión del cambio fueron las competencias clave. La mayoría de los factores de personalidad se correlacionaron significativamente, excepto la extraversión y el neuroticismo. De manera similar, la mayoría de los factores de personalidad se correlacionaron con las competencias, a excepción de la extraversión y el manejo de las emociones.Estos hallazgos ofrecen información valiosa sobre la compleja dinámica de la enseñanza virtual, dentro del contexto del progreso tecnológico y las lecciones aprendidas de la pandemia de COVID-19.).

Introduction

Virtual education has become a stronger teaching model in the last decade, especially given the three higher education modalities in Colombia: face-to-face, virtual, and hybrid. Despite face-to-face and urban education appearing superior in quality based on state exams, virtual education offers learning opportunities to students in areas with limited access to institutions (Arias et al., 2021). Given the distinct teacher-student dynamic in each model, it's crucial to examine the competencies teachers need to effectively facilitate independent learning in virtual education.

Students in virtual education, while overcoming barriers of distance and potential cultural displacement, may face challenges like insufficient academic foundations and competencies compared to students trained in urban areas, potentially impacting their performance and increasing dropout risks (Arias et al., 2021). This emphasizes the need for virtual teachers to possess additional skills to identify student shortcomings due to academic gaps, which can hinder student potential and cause frustration, thus requiring an action plan.

As virtual teachers, we frequently emphasize the importance of continuous and ongoing training for educators. However, we also question whether all teachers possess the personal competencies necessary to engage in such training. Many of us have backgrounds in traditional face-to-face education, both at the basic and professional levels, where we often encountered teachers who lacked the charisma to teach effectively, while others served as exemplary models of inspiration.

Teacher personalities influence educational processes and student interactions. Personality traits can support student character development (Irfan & Marsigit, 2021). Teachers with positive personalities tend to create empathetic, harmonious environments conducive to learning. Traits like self-efficacy, hope, optimism, and adaptability can improve teaching effectiveness (Huang et al., 2018).

Competency-based training is understood as a teaching and learning process aimed at acquiring skills, knowledge, and abilities continuously and permanently to improve the profession, professional development, socio-professional promotion, and professional retraining.

Competencies related to their performance in the student training process in higher education institutions have been the subject of numerous studies. Digital competencies can be understood as the ability to use technologies and comprehend their impact in the digital world, promoting their optimal integration (S.A. NMC, 2017). According to Guillén et al., (2023) Teacher Digital Competence refers to different skills related to the use of tools and technologies in the context, requiring teachers to become facilitators, teach how to use computer tools, provide ways of appropriating information, and create habits and skills in information search, selection, and processing. The guiding principle in the use of technological resources is to adapt ICT to teaching, not teaching to ICT (Villacres et al., 2017).

The challenge in teacher training lies in linking teaching competencies with personality traits to achieve academic development based on what we believe and who we are (Sánchez, 2010). Learning involves reconstructing and restructuring cognitive, emotional, and value-related factors (Scheuer et al., 2006). It requires awareness, reflection, and contrasting latest information with previously stored knowledge. Only by giving greater validity, significance, meaning, and truth to new information can change be generated (Ortiz, 2009). Thus, the cognitive and behavioral transformation of teacher training is complex and requires delving into the ideological network of theories and beliefs that determine how teachers make sense of their professional practice, which must be understood to achieve modification (Korthagen et al., 2006).

On the other hand, studies have shown the importance of considering gender and age in the different studies carried out in order to find significance between the aforementioned variables (Cárdenas et al., 2010; Genise et al., 2020). For example, Shahla & Yugmur (2020), conducted a study on the impact of anxiety, depression and stress on emotional stability. They found that there is no significant relationship in relation to the gender and age of the participants.

The BFQ-2 Personality Factors and Key Workplace Competencies

The Big Five personality model describes five key personality traits: Extraversion, Agreeableness (Friendship in the text), Conscientiousness, Neuroticism, and Openness to Experience. It balances simplicity (fewer traits than some models) and comprehensiveness (more traits than others). This model is based on research using both language and statistical factor analysis, suggesting these five dimensions capture the most important individual differences in personality (BFQ-2: Cuestionario Big Five-2, 2022).

The Big Five personality model explains personality using five core dimensions: Extraversion (social confidence and enthusiasm), Agreeableness (altruism vs. hostility), Conscientiousness (responsibility and perseverance), Neuroticism (anxiety and emotional instability), and Openness to Experience (embracing new ideas and feelings). These five dimensions offer a comprehensive view of personality. Furthermore, six competencies (Proactivity, Leadership, Sociability, Work Quality, Emotional Management, and Change Management) are linked to these Big Five dimensions, aligning with established personality categorization methods (BFQ-2: Cuestionario Big Five-2, 2022).

Personality, according to Fernández (2015), citing Hernández (2012), is the set of identifying characteristics or patterns of an individual, encompassing feelings, thoughts, attitudes, and behaviors. Its formation involves biological factors and is modified through interactions with the environment.

Cuadra (2023) connects the Big 5 Factor Theory to research on the five-factor model by Costa & McCrae (2006), who suggest biological factors primarily determine traits. Costa and McCrae (2006) also state their theory aims to provide a general understanding of human nature and behavior, including exceptions. While basic tendencies of traits are biologically based, their expression in habits, preferences, attitudes, and relationships—termed "characteristic adaptations"—are shaped by experience.

Genise & Etchezahar (2020) points out that Costa & McCrae (1980) propose a grouping of personality traits that facilitates the differentiation of each person into five major factors: "Openness to the experience" to Experience (O), Responsibility (C), Extraversion (E), Agreeableness (A) and Neuroticism (N).

Thus, they understand the trait of "Openness to the experience" to experience" as the personality trait that describes the permeability/depth of consciousness and the need to examine and magnify personal experience (McCrae & Costa, 1997). This trait facilitates creativity, i.e., open people can easily make creative connections between different ideas (Sutin, 2017). This permeability refers to a greater flexibility of mental boundaries. In this sense, Sutin suggests that open-minded individuals are curious, looking for variety and novelty. Similarly, this trait of "Openness to the experience" to experience has several facets: a vivid imagination (O1: fantasy), an appreciation for art and beauty (O2: aesthetics), depth of emotions (O3: feelings), enthusiasm for trying new things (O4: actions), intellectual curiosity (O5: ideas), and being liberal (O6: values).

Similarly, "responsibility" reflects the propensity to be self-controlled, responsible with others, hardworking, orderly, and respectful of rules (Roberts et al., 2006).

Cuadra (2023) suggests that the trait of "Extroversion" is a personality trait that reflects the tendencies to experience and exhibit positive affect, assertive behavior, decisive thinking, and desires for social attention.

On the other hand, Revelle (2017) more extroverted individuals are characterized by "Extraversion," dominance, spontaneity, and sociability.

The "agreeableness" trait describes a set of skills connected to traits such as agreeableness (Graziano & Tobin, 2017). In this sense, Cuadra (2023) cites Laursen et al., (2002), who propose that kindness is associated with stable self-regulatory processes from childhood to adulthood. These processes are related to empathy, worked by Graziano & Tobin (2017), who propose a trio of variables underlying trait kindness: 1- dispositional empathy, 2- temperamental processes of effortful control, and 3- processes associated with social accommodations.

Trait "neuroticism" is a personality trait that involves the tendency to experience negative affect and emotions, including feelings of sadness, anxiety, and anger (Tackett & Lahey, 2017), where high levels of this trait may promote adverse interpersonal outcomes (2009). Similarly, low levels are associated with tremendous occupational success (Roberts et al., 2007) and higher quality of life (Ozer & Benet-Martinez, 2006).

On the other hand, competencies can be defined within both organizational and educational contexts. In education, competencies are described as the knowledge acquired to be used in performance conditions (Trujillo-Segoviano, 2014, cited in the Ministerio de Educación Gobierno de Ecuador, 2023)

This work uses the BFCmap, a statistically validated competency dictionary from Italy, linked to the Big Five theory. This theory identifies six transversal competencies within five macro-areas corresponding to the five major personality factors (Borgogni et al., 2016). Competencies are defined as "a set of behavior signals related to each other and characteristics of that competency, closely connected to work success" (Borgoni et al., 2016, p.7).

These competencies are:

Proactivity: These individuals are energetic, act independently and quickly, use networking to find opportunities, and are persuasive, making them proactive, lively, and friendly communicators.

Leadership: These skills involve managing teams through process oversight, resource allocation, and deadline monitoring. They also include motivating, engaging, and supporting team members' growth by identifying development opportunities.

Sociability: Competencies that characterize an approach to work based on collaboration, integration, and knowledge exchange. Prioritizes relationships and negotiating solutions by recognizing existing knowledge and capabilities.

Quality of Work: Competencies related to the effective management of activities such as planning, organization, and monitoring of results. It also involves assuming responsibilities based on quality and the ability to provide a service that meets and exceeds others' expectations.

Emotional Management: The ability to effectively face difficulties and negative work events from a constructive approach despite challenging, uncertain, or complex scenarios.

Change Management: Competencies related to change management and problem-solving. Individuals with these competencies can generate innovative solutions, promote change, and easily adapt to contextual demands."

Relationships between personality traits and competencies

Individuals share similarities and exhibit differences, reflecting a unique combination of traits. Personality is a complex system with many components, including intellect, character, temperament, disposition, mood, attitudes, behavioral tendencies, traits, states, competence, and mental functions (Mayer, 1995). These components can be described verbally, metaphorically, or mathematically to better understand personality's complexity (Issabekova, Bakiner & Karasah, 2021).

In addition to personality, factors like student learning styles (Grasha, 1996) are crucial in education. Different styles, such as competitive, collaborative, evasive, participative, dependent, and independent, contribute to the learning environment's complexity. Understanding these styles is important for effective teaching and student engagement.

Research indicates personality traits significantly influence learning style and job satisfaction (Li et al., 2021). While active learning techniques improve learning outcomes in traditional classrooms (Dolan & Collins, 2015), their implementation can depend on the teacher's personality and available resources, requiring a careful approach.

A theoretical gap arises concerning the relationship between personality traits, as defined by Caprara and Cervone (2003), and teaching competencies in technology-mediated interactions like virtual education. This research aims to address this gap by exploring the articulation of personality dimensions—"Extraversion," Kindness, Tenacity, "Neuroticism," and Open-Mindedness—from the BFQ-2 Test with the competency model proposed by Caprara et al., (2018).

This study examines 155 teachers from a Colombian Caribbean virtual university. It uses the BFQ test to assess personality traits and competencies, focusing on proactivity, leadership, sociability, work quality, change management, and emotional management.

Prior research suggests that individuals with traits related to agreeableness and conscientiousness demonstrate improved job performance. Similarly, conscientiousness (Tenacity in the text) and "Neuroticism" are linked to positive outcomes (McCrae & Costa, 1986). Traits like "Openness to Experience" are associated with academic success, intelligence, creativity, and intellectual curiosity. Fostering these traits in educational settings and student interactions can create a more enriching learning environment.

This research encourages reflection on the relationship between personality traits and competencies to improve teaching and learning, ultimately aiming to develop proposals that strengthen student learning processes and contexts.

Influence of Teachers' Personalities on Learning

Teachers' personalities significantly impact education and student interactions (Irfan & Marsigit, 2021), predicting effective teaching (Njoku, 2020; Irfan, 2021). Positive teacher personalities create positive learning environments. Traits like self-efficacy, hope, optimism, and adaptability enhance teaching (Zhang, 2023). Research suggests a link between teacher personality and educational processes, advocating for connecting teaching competencies with personality traits to align academic development with personal beliefs and professional identity (Lukman et al., 2021).

Competency-based training is crucial for professional development, providing skills, knowledge, and abilities. Exploring competencies related to student training in higher education, especially digital competencies, is essential. Teacher digital competence involves using technology in education and guiding students to enhance traditional teaching (Vandeyar, 2020). It requires fostering information appropriation and developing information search, selection, and processing skills (Guillen et al., 2023).

Solving teacher training challenges requires connecting teaching competencies with emotions, impacts, and efforts (Nuraini et al., 2021). Teacher Digital Competence highlights the need for technical skills and the ability to facilitate student learning, promote information appropriation, and cultivate information management habits and skills (Guillén-Gámez et al., 2023).

Learning involves reconstructing cognitive, emotional, and value-related factors (Pozo et al., y Echeverría, 2006). It requires conscious reflection and validating new information. Teacher education involves complex cognitive and behavioral changes, necessitating an examination of the ideological network of theories and beliefs that influence educators' professional practice (Committee on How People Learn II: The Science and Practice of Learning;

Board on Behavioral, Cognitive, and Sensory Sciences; Board on Science Education; Division of Behavioral and Social Sciences and Education; National Academies of Sciences, Engineering, 2018).

Therefore, students with high academic motivation prefer task-oriented teachers, while those with low academic motivation value relationship-oriented teachers more (Keerthigha & Singh, 2023).

Teachers in Virtual Education

The prevalence of technology has created new educational styles and challenges. The impact of technological, economic, and cultural factors drives the search for adaptable learning conditions. Consequently, developing digital competencies has become a global priority for governments (European Commission, 2020).

Distance education emerged to address accessibility challenges in higher education, aligning with pedagogical, scientific, and technical advancements (Yong É., Nagles N., Mejía C. & Chaparro C.E, 2017). Successful distance education, mitigating the social educational gap, evolved into "virtual education" with the rise of new technologies.

Technology-mediated education has redefined student and teacher roles. Teachers become learning mediators, while students take a more active role, developing self-regulation and self-discipline for autonomous learning, and improving teamwork skills (Silva-Quiroz, 2010).

Therefore, educators face the challenge of developing new skills to ensure the proper use of technological resources, motivating students to be curious learners using different platforms in the digital world (Guevara et al.; S., 2021).

Garrison and Anderson (2005), cited by Silva-Quiroz (2010), emphasize the importance of participatory communication environments in online education, highlighting "context and the creation of learning communities to facilitate reflection and critical discourse." This underscores the teacher's role in guiding student cognitive and social processes towards meaningful learning. Virtual learning involves four key elements: cognitive, social, in-person, and the teacher's role.

Leal (2022) considers it crucial to recognize leadership and proactive actors within the organization, as it promotes innovation, relevance, interest in solving problems, and motivation to achieve collective results that satisfy all organization members.

UNESCO (2022) highlights a greater challenge for teachers regarding competencies, emphasizing the need for digital skills and the ability to understand emerging technologies like Artificial Intelligence (AI). This requires teachers to develop the knowledge, skills, and attitudes necessary to understand AI's educational functions and ensure its ethical and practical implementation in their teaching (Coca & Llivina, 2021).

UNESCO (2023) stresses the challenge for universities to create interdisciplinary programs and curricula that develop AI and digital transformation competencies. This includes integrating tools like ChatGPT for learning, research, administration, and community engagement, while considering ethical implications such as academic integrity and data protection.

Method

This quantitative, descriptive, and non-experimental cross-sectional study (Manjunatha, 2019) aimed to characterize the personality traits and transversal skills of teachers at a virtual university in the Colombian Caribbean. The research question guiding the study was: ¿What skills and personality traits predominate among teachers at a virtual university in Colombia?

As H0, there is no significant relationship between personality traits and transversal competencies of teachers at the virtual education university in Colombia, nor are there significant differences between men and women in these aspects.

As H1, there is a significant relationship between the personality traits and transversal competencies of teachers at the virtual education university in Colombia and there are significant differences between men and women in these aspects.

This study used a non-probabilistic, convenience sampling method, with 155 teachers from a virtual university in northern Colombia participating. Participants were contacted via email, informed about the study's purpose, data handling, and voluntary participation, and provided with a link to the test.

Instrument

The study used the BFQ-2 questionnaire (Caprara et al., 2018), based on the Big Five theory, to evaluate five personality factors: Agreeableness, Openness to Experience, Neuroticism, Conscientiousness, and Extraversion. This second version of the "Big Five" consists of 134 items and is administered individually, often via an online platform.

In addition to the personality traits provided by the BFQ-2, the test also produces a report that provides hypothetical competence profiles (Proactivity, Leadership, Sociability, Quality of work, Emotion Management, and Change Management) extracted from the BFCmap © a recognized dictionary of competencies validated in the organizational field.

The BFQ-2 is completed with a scale L = Lie (14 items) divided into Selfish Lie (measures the tendency to attribute positive qualities associated with social and intellectual status) and Moralistic Lie (measures the tendency to attribute morally desirable qualities to oneself).

It is considered an instrument with a high reliability index in Europe and the United States. On this occasion, it was found that Cronbach's Alpha was 0.980.

The instrument underwent expert validation, with academics reviewing it online. They found the questions clear, coherent, relevant, and sufficient, with vocabulary appropriate for the Colombian population.

Results

Data was analyzed using Jamovi 2.6.13 to calculate descriptive statistics and measures of association. Frequency analysis revealed that participants came from all university training schools in the Caribbean region. The sample consisted of 54% females and 46% males.

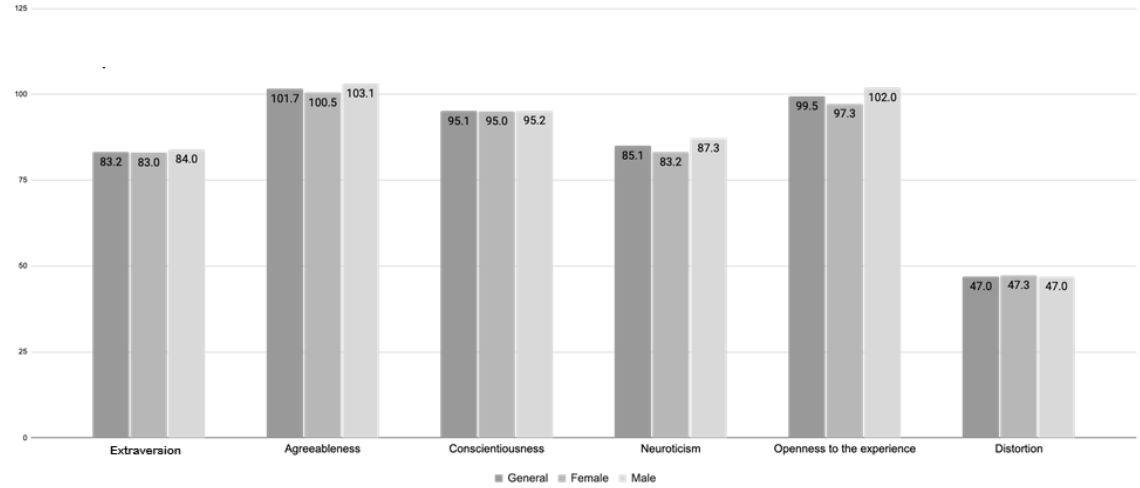
The average age of participating teachers was 41.8 years (41 years and 9 months). Women averaged 40.9 years (40 years and 11 months), while men averaged 43.1 years (43 years and 1 month). The oldest teacher was 66 years old, and the youngest were 25 (female) and 23 (male).

Sociodemographic variables such as age and gender are taken into account, giving the opportunity to a heterogeneous sample to show experiences from each of the groups and generate a greater understanding of the processes (Subsecretaría de Educación Parvularia, 2023).

Figure 1 shows personality scores across dimensions, with distinctions based on gender. In "Extraversion," males scored slightly higher than females (84.0 vs. 83.0). Similarly, in Agreeableness, males scored higher (103 vs. 101). Conscientiousness scores were consistent (95 for both genders). "Neuroticism" exhibited a slight gender difference (87 for males, 83 for females). In "Openness to the experience," males scored higher (102 vs. 97). Notably, Distortion scores remained uniform across genders (47 for both). The numbers indicate subtle gender differences regarding enthusiasm, agreeableness, emotional resilience, and "Openness to the experience."

Figure 1.

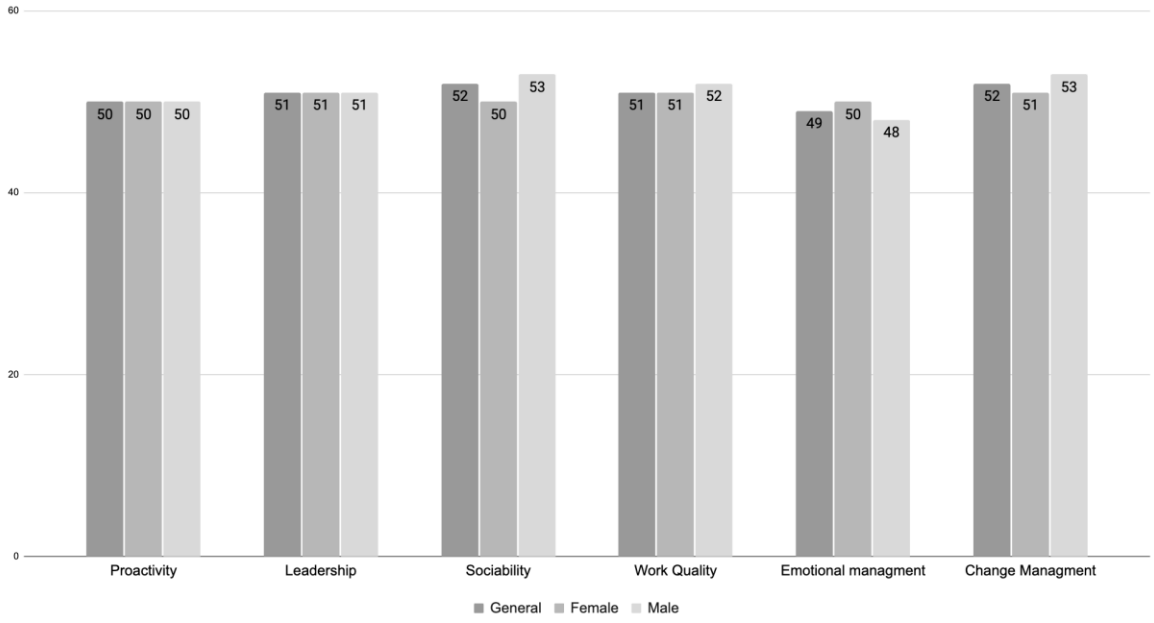
Distribution of means of the BFQ-2 personality traits.



In addition, Figure 2 indicates the distribution of means of the BFQ-2 competencies presented by the group, and gender is shown, highlighting Change Management (51.6), Sociability (51.3), and Quality of Work (51.3).

Figure 2.

Distribution of Mean Competences in BFQ-2



Proactivity and Leadership scores were consistently around 50 across all groups. Sociability showed minor gender differences, with males scoring higher (53) than females (50). Work Quality showed almost no variation, averaging 51.3. Emotional Management averaged 48.9, and Change Management averaged 51.7. These averages reveal central competency tendencies and subtle differences between group

To compare the personality traits proposed by the Big Five Questionnaire (BFQ) concerning the gender variable within the sample, the One-Way ANOVA statistical analysis was employed through Fisher´s analysis (See Table 1).

This statistic allowed the means to be compared in order to determine if there is a significant difference between the means of the groups.

Table 1.
Direct Scores One-Way ANOVA (Fisher's).

	F	df1	df2	p
Extraversion	0.1860	1	53	0.667
Agreeableness	3.3144	1	53	0.071
Conscientiousness	0.0184	1	53	0.892
Neuroticism	3.9138	1	53	0.050
Openness to the experience	7.9741	1	53	0.005

To demonstrate the normality of the data, the Shapiro-Wilk test was performed due to its high power in detecting deviations from normality, even in large samples, and it provides an accurate estimate of the probability that the data come from a normal distribution. In the case of personality, revealing the assumption of normality for all variables ("Extraversion," Agreeableness, Conscientiousness, Emotional stability, and "Openness to the experience"), revealing that the sample data exhibit normality with values exceeding $p > 0.05$ (0.49, 0.1, 0.1, and 0.09) See Table 2.

Table 2.
Normality Test (Shapiro-Wilk).

	W	p
Extraversion	0.992	0.491
Agreeableness	0.987	0.145
Conscientiousness	0.987	0.163
Neuroticism	0.986	0.129
Openness to the experience	0.985	0.090

Note. A low p-value suggests a violation of the assumption of normality.

To compare the two variances, One-Way ANOVA was used to determine whether the observed differences between group means are statistically significant or simply due to chance.

Furthermore, the homogeneity of variances was disclosed through Levene's test in the context of a One-Way ANOVA for the five personality traits. The results disclosed diverse levels of heterogeneity

among the traits. For "Extraversion," Levene's test produced an F-statistic of 2.2953 with 1 degree of freedom, suggesting a potential difference in variances. Likewise, Agreeableness exhibited an F-statistic of 2.5436 (df = 1), implying heterogeneity in variances. Conscientiousness displayed a moderate F-statistic of 1.6117 (df = 1), indicating potential variability among group variances. "Neuroticism" demonstrated the highest F-statistic of 3.2845 (df = 1), implying notable differences in variances. Conversely, "Openness to the experience" exhibited a minimal F-statistic of 0.0545 (df = 1), suggesting consistent variances across groups (See Table 3).

Table 3.

Homogeneity of Variances Test (Levene's)

	F	df1
Extraversion	2.2953	1
Agreeableness	2.5436	1
Conscientiousness	1.6117	1
Neuroticism	3.2845	1
Openness to the experience" to the experience	0.0545	1

In this context, the data support the null hypothesis in both cases, signifying the assumption of normality and homogeneity. Consequently, the One-Way ANOVA using the Fisher is corroborated.

A Tukey Post Hoc test found that for extraversion, there was a notable mean difference between the male and female groups. Specifically, the mean difference for males is -0.583 compared to females, indicating a lower "Extraversion" score among males. However, the p-value associated with this difference is 0.667, rendering it non-significant. This implies that the observed discrepancy between genders in "Extraversion" levels is not statistically significant. Additionally, the post-hoc test for males alone indicates no significant mean difference. It is crucial to note that the provided significance levels (* p < .05, ** p < .01, *** p < .001) suggest that, in this instance, the p-value of 0.667 exceeds the typical significance threshold of 0.05, further supporting the conclusion that the gender-based disparity in "Extraversion" levels is not statistically significant based on the conducted analysis using Jamovi 2.6.13.

A difference of -2.58 between the male and female groups was found for Agreeableness. However, the associated p-value is 0.071, indicating that this difference is not statistically significant at the conventional significance level of 0.05. The non-significant p-value suggests insufficient evidence to reject the null hypothesis, implying that the mean difference in Agreeableness between genders may be due to random variation rather than a genuine

difference. It is important to note that the notation * p < .05 is not applicable in this instance, reinforcing the non-significant nature of the observed results.

For Conscientiousness, the results showed a mean difference of -0.202 between the two genders. However, the associated p-value is 0.892, exceeding the conventional significance threshold of 0.05. No statistically significant difference in Conscientiousness scores was found between males and females. Observed variations are likely due to chance.

In other words, this indicates a lack of statistically significant differences within this group concerning these personality traits.

However, differential, and significant values are observed, particularly in Neuroticism (p < -4.06*) and "Openness to the experience" to the experience (p < -4.82**) are higher in males. For the first variable, a notable difference of -4.06 was observed between the male and female categories, and the associated p-value is 0.050. The significance level is just on the borderline of conventional thresholds (p < .05). While the result is considered significant, it is crucial to exercise caution due to its proximity to the significance threshold. The asterisk (*) notation denotes statistical significance at the 0.05 level. Consequently, the findings suggest a noteworthy difference in Neuroticism scores between genders, but further scrutiny and consideration of effect size may be warranted given the marginal significance level.

In addition, in the variable "Openness to the experience," a substantial mean difference of -4.82 is evident between the male and female categories, and the associated p-value is 0.005, falling below the conventional significance threshold of 0.05. The asterisk (*) notation, indicating statistical significance at the 0.05 level, emphasizes the robustness of this result. The findings suggest a significant disparity in "Openness to the experience" scores between genders, implying that the observed difference is unlikely to have occurred by random chance. The low p-value strengthens the evidence supporting rejecting the null hypothesis, underscoring the meaningfulness of the observed gender-based difference in "Openness to the experience."

One-Way ANOVA - Competencies

In addition to personality traits, competencies were assessed based on normality and homogeneity criteria, considering gender. The analysis revealed homogeneity across all competencies.

The variables were tested for normality and homogeneity. All variables were homogenous across genders, except for "Sociability," which was not normally distributed (p < 0.05, specifically 0.008). Therefore, the Shapiro-Wilk test was used (see Table 4).

Table 4.
Normality Test (Shapiro-Wilk)

	W	p
Proactivity	0.989	0.248
Leadership	0.993	0.611
Sociability	0.976	0.008
Work Quality	0.992	0.503
Change Management	0.983	0.055

Table 4.
Normality Test (Shapiro-Wilk)

	W	p
Emotional Management	0.988	0 .192

Note. A low p-value suggests a violation of the assumption of normality.

Similarly, in Table 5, the homogeneity of variance is analyzed, focusing on the competency of 'Emotion Management,' which displays variability (0.024). The Levene's Test was employed to evaluate this aspect.

Table 5.

Homogeneity of Variances Test (Levene's)

	F	df1	df2	p
Proactivity			53	0.437
Leadership			53	0.190
Sociability			53	0.182
Work Quality			53	0.131
Change Management			53	0.358
Emotional Management			53	0.024

Similarly, through the Post Hoc test, it is evident that the competencies of Proactivity, Leadership, Work Quality, and Change Management exhibit normality and homogeneity in both men and women, as they present values greater than $p > 0.05$ (0.4, 0.8, 0.66, and 0.06, respectively).

Likewise, significant differences are observed in the 'Sociability' competency, as indicated by the Kruskal-Wallis statistic with values less than $p < 0.05$ (0.022) and Games-Howell Post-Hoc (0.018). Consequently, it is concluded that, within this group, the male gender demonstrates superior sociability competency compared to the female gender.

Contrastingly, no significant differences are evident between men and women in the 'Emotion Management' competency, with a p-value greater than 0.05 (0.336) according to the Kruskal-Wallis statistic.

For the remaining competencies, One-Way ANOVA is analyzed using the Fisher statistic (See Table 6)."

Table 6.

One-way ANOVA (Fisher's)

	F	df1	df2	p
Proactivity		1	53	0.463
Leadership		1	53	0.819
Sociability		1	53	0.019
Work Quality		1	53	0.665
Change Management		1	53	0.060
Emotional Management		1	53	0.195

To further analyze the data, correlations between variables were examined. The analysis revealed significant relationships between most competencies and personality traits assessed by the BFQ-2 test, as shown in Table 7.

Table 7.
Correlation Matrix between Personality Traits and Competencies.

		Extraversion	Agreeableness	Conscientiousness	Neuroticism	Openness to the experience	Leadership	Sociability	Work Quality	Emotional Management	Change Management	Proactivity
Extraversion	Spearman's rho	—										
	p-value	—										
Agreeableness	Spearman's rho	0.273 ***	—									
	p-value	< .001	—									
Conscientiousness	Spearman's rho	0.459 ***	0.474 ***	—								
	p-value	< .001	< .001	—								
Neuroticism	Spearman's rho	0.090	0.408 ***	0.342 ***	—							
	p-value	0.266	< .001	< .001	—							
Openness to the experience	Spearman's rho	0.427 ***	0.556 ***	0.604 ***	0.504 ***	—						
	p-value	< .001	< .001	< .001	< .001	—						
Leadership	Spearman's rho	0.776 ***	0.469 ***	0.677 ***	0.236 **	0.608 ***	—					
	p-value	< .001	< .001	< .001	0.003	< .001	—					
Sociability	Spearman's rho	0.270 ***	0.961 ***	0.509 ***	0.534 ***	0.644 ***	0.522 ***	—				
	p-value	< .001	< .001	< .001	< .001	< .001	< .001	—				
Work Quality	Spearman's rho	0.566 ***	0.556 ***	0.931 ***	0.288 ***	0.668 ***	0.809 ***	0.598 ***	—			
	p-value	< .001	< .001	< .001	< .001	< .001	< .001	< .001	—			
Emotional Management	Spearman's rho	0.069	0.443 ***	0.427 ***	0.902 ***	0.486 ***	0.348 ***	0.584 ***	0.422 ***	—		
	p-value	0.396	< .001	< .001	< .001	< .001	< .001	< .001	< .001	—		
Change Management	Spearman's rho	0.491 ***	0.612 ***	0.632 ***	0.437 ***	0.947 ***	0.702 ***	0.703 ***	0.730 ***	0.485 ***	—	
	p-value	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	—	
Proactivity	Spearman's rho	0.765 ***	0.678 ***	0.646 ***	0.322 ***	0.736 ***	0.789 ***	0.721 ***	0.777 ***	0.391 ***	0.845 ***	—
	p-value	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	—

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

Strong, significant correlations (p < .01) were found between Work Quality and Leadership, Sociability, and Conscientiousness (Tenacity in the text). Change Management also showed a strong, significant correlation with Openness to Experience (Open-mindedness in the

text). However, no significant relationships were observed between Energy and Emotional Stability ($p = 0.26$), nor between Emotion Management and Energy ($p = 0.39$).

Discussion and Conclusion

The BFQ-2 assessment of UNAD teachers' personalities revealed "agreeableness" as a dominant trait. Among competencies, sociability and change management were prominent. These virtual teachers demonstrated sensitivity, openness to experience, understanding of others, and a willingness to support others. Their empathy suggests strong teamwork and collaboration skills. Their change management abilities indicate they can address challenges with a broad perspective, adaptably offering innovative solutions and demonstrating negotiation skills.

Key competencies among the teachers included change management, sociability, and work quality, all of which correlate with better job performance. Proactivity, linked to autonomous action, aligns with research by Chen, Bao, and Gao (2021), suggesting an ability to manage stress, utilize resources, and seek opportunities. The teachers' apparent lack of avoidance behaviors suggests they may be well-suited to mediating virtual teaching and learning.

Both male and female educators demonstrated Proactivity, Leadership, and high-quality work management, including planning, organization, and monitoring. Change management competency, facilitating problem-solving and adaptability, was also apparent. These competencies enable teachers to develop students' skills in using technology effectively, promoting creativity, curiosity, and proactivity through digital platforms, as suggested by Guevara, Cedeño, Escobar, and Medina (2021).

Both male and female teachers showed consistent traits of agreeableness, openness to experience, conscientiousness (Tenacity in the text), and emotional management, all linked to professional success and job satisfaction. Males showed higher levels of neuroticism, open-mindedness, and sociability. The connection between personality, learning styles, and job satisfaction highlights the need for adaptable teaching (Li et al., 2021). These teachers, with their specific traits, are expected to foster student autonomy, problem-solving, adaptability, and self-directed learning.

Significant associations were found between competencies and personality traits, supporting Caprara, Barbaranelli, Borgogni, and Vecchione (2018). Proactivity, Leadership, Sociability, Work Quality, Change Management, and Emotional Management correlated strongly with Extraversion, Agreeableness, Conscientiousness (Tenacity), Neuroticism, and Openness to Experience (Open-mindedness). Work Quality was strongly linked to Leadership, Sociability, Conscientiousness, Change Management, and Openness to Experience. However, no significant relationships existed between Extraversion and Neuroticism, nor between Emotional Management and Extraversion.

This study encourages reflection on the relationship between personality and competencies in virtual education, suggesting proposals to strengthen teaching and learning. Further research with diverse virtual pedagogical models is recommended. Integrating teachers' technological, pedagogical, and academic skills requires considering personality and emotional states that support their teaching roles, including navigating contextual challenges and adapting to diverse student characteristics and learning styles.

This study emphasizes the significant role of teacher personality in shaping competencies and effectiveness in virtual education. The prevalence of agreeableness, sociability, and openness to experience among UNAD teachers highlights the importance of these traits in fostering collaborative learning and managing change. The findings suggest a

need for professional development that not only improves digital and pedagogical skills but also nurtures personality traits that support effective teaching and student engagement.

Therefore, the recommendation for both educational institutions of higher education and teachers themselves, strengthen their digital and didactic competencies, which promote learning to learn in all disciplinary scenarios that lead to training professionals who meet glocal needs, enhancing the personality traits and skills of each teacher in favor of student learning.

In conclusion, this study highlights the importance of teachers' personality traits (like Agreeableness and Openness to Experience) and transversal skills for student success. The significant correlations between personality and competencies underscore the need to consider individual teacher characteristics when designing effective virtual teaching strategies. Understanding these factors can inform tailored training and support to enhance teaching effectiveness in virtual higher education.

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