Exploring the Relationship of the Big Five Personality Traits with Student Satisfaction with Synchronous Online Academic Learning: The Case of Covid-19-Induced Changes

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1 Introduction

Online synchronous educational experience via videoconferencing has become ubiquitous with the spread of Covid-19 Virus. Online educational experiences through computer-mediated communication have become widespread during the pandemic [1]. Synchronous online learning with the use of advanced technology, can increase students' feeling of connection to instructors and other students according to some studies. Due to instant feedback and interaction with peers and instructors, even if limited, students' engagement is increased when compared to that of asynchronous online learning. Participants in asynchronous online learning are not required to be online at the same time [2] and lack opportunities to peer with colleagues and professors real time [3, 4].

Online learning, synchronous or asynchronous, may not be suitable for every student. Students are different depending on their personality and their prior knowledge among other variables, thus affecting the outcome of the results obtained from the online academic learning [5]. The purpose of this paper is to contribute to the literature on exploring the relationship between personality factors and student satisfaction with synchronous online academic learning. The literature on the subject of this study is rather scant and that leads us to the conclusion that there is a need a great amount of research before we can have an appreciation of the nature of the relationship between the big five personality traits and satisfaction with synchronous online academic learning (SOAL) [5–7]. What complicates even further the relationships of the variables involved in the present study, is the adoption of SOAL not in a planned manner but through the disruption caused by the pandemic of the Covid-19. Most of the universities in the developed countries have discontinued their conventional programs many of them adopting SOAL ones. The new

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reality created conditions hindering the learning process posing questions of what the appropriate course of action will be for University administrators, teachers, and students alike [5, 7, 8]. A very small number of studies have tried to investigate whether there is a relationship between personality traits and satisfaction with synchronous online academic learning, they nevertheless refer to contexts of well—thought of endeavors by Universities, and strategically offering their services to students who chose SOAL [5, 9].

Measuring online student satisfaction has been a 'hot topic' for the academia [5], but there is no literature addressing the nature or the existence of the relationship between personality and satisfaction with online learning environments, especially post—disruption [9]. Following is the analysis of the big five personality traits. The recognition of the personality traits that affect SOAL may help to increase success in online course design and lead to greater student satisfaction levels [5].

2 Big Five Personality Traits

The Big five personality traits (openness, conscientiousness, extraversion, agreeableness, neuroticism) also known as the Big Five Personality model comprise the fundamental structure of human personality. A brief analysis of these traits is set out below.

- Openness to experience is a personality trait that describes a creative individual, intellectually curious, with an active imagination, adventurous, with unconventional ideas. Individuals that have this personality trait are unpredictable, risk takers, they lack concentration and appreciate the importance of spiritual and artistic quests [10–13]. This personality trait is directly related to a successful academic performance in students as well as a successful workplace performance [10, 14]
- Conscientiousness describes the level of self-competence, work discipline, organization and scheduling, self-control, the acceptance of conventional rules and the responsibility towards others. Individuals characterized by this personality trait are organized, reliable, self-disciplined, act with dignity, are attentive and persistent [10, 15]
- Extraversion refers to interpersonal skills. Individuals characterized by this personality trait are friendly, warm, social, extroverted, energetic, ambitious, confident and seek enthusiasm and stimulation through communication and conversation with others [10, 11]
- Agreeableness is a dimension that involves someone's behavior towards others. Individuals with this personality trait are trustful, altruistic, cooperative, and modest. They demonstrate sympathy and concern for the needs of others. They also show understanding when necessary to avoid conflict. Individuals that are not agreeable may be described as selfish, suspicious, and unscrupulous [10, 11]

– Neuroticism describes an individual's tendency to be under psychological stress [13]. Individuals with this personality trait are sensitive and usually face negative feelings such as anger, stress and depression [11]. Neuroticism is related to the degree of emotional stability. Emotionally stable individuals are described as calm, stable, mature, and resilient. Individuals with low emotional stability are irritable. Low emotional stability can be observed in insecure individuals as well as dynamic individuals, since in many cases it incurs from their dynamism [10, 16].

The extensive search on the existing literature revealed questions that remain unanswered and unfilled. At this time, the few relevant studies [5, 9] leaving a gap in our understanding the relationship of the five personality traits with SOAL. Based on these gaps, the purpose of this paper is to contribute to the literature on exploring the relationship between personality factors and student satisfaction with SOAL.

3 Methods

The purpose of this paper is to contribute to the literature on exploring the relationship between personality factors and satisfaction with synchronous online academic learning. We used a 30-item questionnaire to measure the Big Five personality factors, an instrument previously tested and validated in other studies [10, 17–19]. There were 555 questionnaires answered by students, who study in a Public Greek University located in Athens during the lockdown period from March to April 2020. The sample was a convenience one given that the resources available were limited, but the size of it allows us to proceed with a reasonably and reliably statistical analyses and produce valid conclusions. We examined the relationships between the Five personality factors and the dependent variable which is student satisfaction with SOAL. Factor analysis is used to reduce the number of variables into fewer numbers of factors, with five factors retained (openness, conscientiousness, extraversion, agreeableness, neuroticism). Cronbach's alpha reliability test was used to measure the reliability of the items of each factor. Furthermore, a multiple regression analysis was used, with satisfaction with online academic learning as a dependent variable and the personality factors as independent variables. The data were analyzed using the multiple regression routine of SPSS software version 24.

4 Results and Findings

The total sample of the study consisted of N = 555 respondents, 326 (59%) were females and 229 (41%) males. The structure of the observed correlations was determined by the factor analysis method Table 1, identifying the groups of variables that have a high correlation. As shown in the table below the first factor is openness, the second is conscientiousness, the third is extraversion, the fourth factor is agreeableness, and the last factor is neuroticism. Table 2 with the KMO and Bartlett's Test shows that the sample data were suitable for Factor analysis (KMO = 0.803 > 0.60, Bartlett's Test significance <0.001) [20, 21].

Subsequently we ran a reliability test Cronbach's alpha interpreted for the questions of each factor. The results have shown that alpha coefficient for the first factor (openness) is 0.791, for the second factor (conscientiousness) is 0.753, for the third factor (extraversion) is 0.749 and for the fifth factor is 0.695 (neuroticism). In most cases in social science research a reliability coefficient of 0.7 or higher is acceptable. The alpha coefficient for the fourth factor (agreeableness) is 0.573 < 0.7 that means that the items have not high internal consistency [21, 22]. Figure 1 shows the average of the responses that compose the five above factors and satisfaction with online academic learning.

The overall regression model was significant, the value of R^2 is significantly greater than zero. Table 3 demonstrates the predictive power of the independent

Table 1 Factor analysis identifying the big five personality traits

Item	I see myself as someone Who…	f1	f2	f3	f4	f5
O1	Is authentic, with new ideas	0.630				
O2	Has a vivid imagination	0.780				
O3	Is inventive	0.749				
O4	Likes to think and play with ideas	0.811				
C1	Does my job carefully		0.695			
C2	Is reliable		0.820			
C3	Works efficiently		0.805			
E1	Talks a lot			0.659		
E2	Is sociable			0.677		
E3	Starts conversations			0.801		
E4	Feels comfortable around people			0.710		
A1	Sympathize with others' feelings				0.786	
A2	Has a soft heart				0.505	
A3	Treats with kindness				0.801	
N1	Worry about things					0.629
N2	Is not calm					0.807
N3	Is stressed out easily					0.573
N4	Gets upset easily					0.795

Table 2 KMO and bartlett's Test

Kaiser-Meyer-Olkin measure of sampling adequacy		0.803
Bartlett's test of sphericity	Approx. Chi-Square	3151.732
	df	153.000
	Sig.	0.000

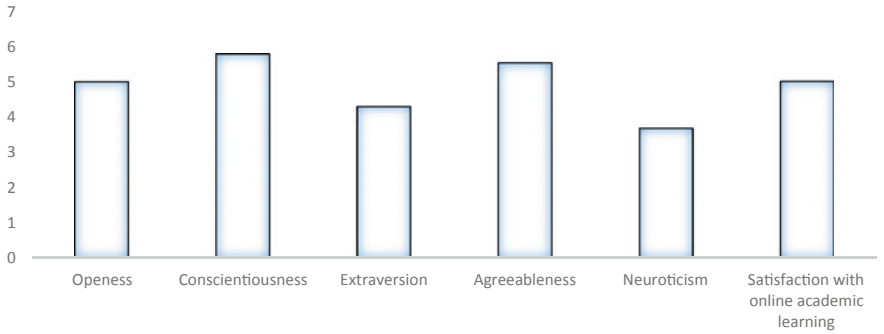

Fig. 1 Average of the responses

Table 3 Model summary

Model	R	R Square	Adjusted R square	Std. Error of the estimate
1	0.712[a]	0.507	0.502	0.634

[a]Predictors: (Constant), Neuroticism, Agreeableness, Openness, Extraversion, Conscientiousness

variables, in terms of student satisfaction with SOAL. The results have shown that 50.2% of the variance the dependent variable is explained by the independent variables (openness, conscientiousness, extraversion, agreeableness, neuroticism) (Table 4). Table 5 shows the predictive ability of the five factors, concerning satisfaction with online academic learning. Openness to experience and conscientiousness have a positive relationship with student satisfaction while neuroticism has a negative one. The variable that affects satisfaction most is openness. Openness, conscientiousness, and neuroticism have a statistically significant impact on the outcome variable (p values <0.05) but extroversion and agreeableness were proven non-significant predictors (p value = 0.583, p value = 0.452 respectively) [20].

The results presented above lend partial support to the findings reported in two earlier studies [5, 9]. Conscientiousness has a significant relationship with self-regulated learning which is quintessential in SOAL and in online programs in general, since students with this trait tend to be more responsible, intrinsically motivated and need little external guidance. Openness also has a significant positive relationship to student satisfaction with SOAL, more than any of the other big five traits. This runs counter to the findings reported by the studies mentioned earlier,

Table 4 ANOVA

Model		Sum of squares	df	Mean square	F	Sig.
1	Regression	226.773	5	45.355	112.846	0.000[b]
	Residual	220.652	549	0.402		
	Total	447.425	554			

[a]Dependent variable: satisfaction with online academic learning
[b]Predictors: (Constant), Neuroticism, Agreeableness, Openness, Extraversion, Conscientiousness

Table 5 Coefficients[a]

Model		Unstandardized coefficients		Standardized coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.178	0.270		4.365	0.000
	Openess	0.406	0.030	0.469	13.584	0.000
	Conscientiousness	0.362	0.036	0.338	9.949	0.000
	Extraversion	0.014	0.025	0.018	0.549	0.583
	Agreeableness	−0.020	0.026	−0.024	−0.752	0.452
	Neuroticism	−0.066	0.025	−0.082	−2.610	0.009

[a]Dependent variable: student satisfaction with online academic learning

perhaps because the SOAL in the present study was implemented in a disruptive way, due to the coronavirus pandemic, rather than the well-organized SOAL conditions characterizing the samples involved in the aforesaid studies [5, 9]. Neuroticism has a relatively weak but nevertheless significant relationship with the student satisfaction with SOAL, corroborating earlier findings in another study [9], which reported however a much stronger relationship. Extraversion and Agreeableness appear to have no effect on student satisfaction in this study. This finding agrees with the findings in the other two studies mentioned here [5, 9]. The findings reported in this study should be interpreted with caution. The respondents are university students who changed their normal course taking to a SOAL one, within the space of two weeks. In spite of the sudden change though, we can derive some conclusions even tentative ones. As expected not all personality types responded in the same way to the change. This implies that some of the students do not feel they benefit as much as others from SOAL, which is a challenge to all parties involved in the learning process, i.e., Administrators, Students and Teachers. Students not satisfied with SOAL should be approached and inquired to provide the feedback needed, on which the university policies will be based to remedy the problem. Structural changes in the course may also be helpful in overcoming the obstacles caused by the covid-19 pandemic. Further implications may involve the acquisition of technologies and technology savvy personnel, including Teacher training to facilitate the handling of the disruption.

5 Conclusions

This study, contributes to the literature on personality factors influencing student satisfaction with synchronous online academic learning, providing empirical evidence, to help formulate more effective policies that increase online student satisfaction. The implications of the study are important for both educators and policy makers. The newness of the pandemic phenomenon disrupting the global economy and all other social aspects of modern life, presents an enormous challenge for scientists from all disciplines, including those involved in the education process. This study has attempted to illuminate the issues raised by the sudden change of conventional classroom teaching to SOAL and specifically the degree of satisfaction felt by the students following the change in the teaching method to online teaching. The findings reveal the existing differences in satisfaction from SOAL among students with different personality traits. Although the study does not include actual learning outcomes implications, student satisfaction can be assumed to be linked to those. There are limitations to this study's findings that could be addressed in future research. The findings presented here need corroboration from more studies involving a wider spectrum of subjects and to that effect they are considered preliminary [9]. Further studies could include addressing the gender issue not discussed here, the differences that may exist between students of diverse fields and the use of samples from more than one culture, to draw more generalizable conclusions [23]. This study can have a significant impact on the development of synchronous online academic learning programs. Both program designers and teachers alike need to consider the personality difference effects on the learning process and outcomes and make the necessary changes to help the adaptation of all involved to the new circumstances however lasting they may be.

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