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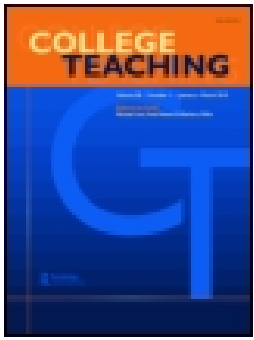
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Can Personality Traits Predict Students' Satisfaction with Blended Learning during the COVID-19 Pandemic?

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ABSTRACT

The present study aimed to assess the impact of personality traits on student satisfaction with blended learning which many higher education institutions have adopted since the COVID-19 pandemic in the UK. Personality traits were assessed using the International Personality Item Pool and student satisfaction was recorded on a 7-point Likert scale. Data analysis of 72 undergraduate students revealed that low extraversion and high neuroticism predicted higher levels of student satisfaction. Implications are discussed considering the current pandemic with a view of increasing student satisfaction and in-turn improving National Student Survey results that impact on Teaching Excellence Framework scores and league tables.

KEYWORDS

Blended learning; COVID-19; higher education; personality traits; student satisfaction

Introduction

One of the new challenges that universities now face is the government-led Teaching Excellence Framework (TEF) which was established to complement the Research Excellence Framework (REF) in that it would provide a range of information regarding institutional performance across the higher education (HE) sector (Gunn, 2018). Accompanying the TEF is the National Student Survey (NSS), derived in 2005 (Mantzios et al., 2020), which is similarly used to provide a measure of student satisfaction for prospective students and is completed by third-year undergraduates (Surridge, 2008). As the results of the TEF (including NSS results) and REF are now firmly embedded in the UK HE sector with the creation of Higher Education Institution (HEI) league tables (Hazelkorn, 2015), student satisfaction and retention are key considerations for educators in the UK (Fowler & Boylan, 2010).

Student satisfaction can be defined as a subjective feeling of a learner toward their own experiences in educational settings (Astin, 1993). Student satisfaction has a bidirectional relationship with one's engagement and achievement, so that those who are more satisfied with their course perform better, which in turn leads to higher satisfaction levels (Pike, 1991). Factors that

impact student satisfaction include teaching quality, faculty preparedness, social integration, and the availability of services and facilities (Green et al., 2015; Thomas & Galambos, 2004). Thus, under usual circumstances, universities tend to focus on these factors to improve student experiences, which in turn increases the success of students' learning (Oja, 2011).

Personality is defined as an individual's combined characteristics and traits (Jung, 1923). A Five-Factor Model of Personality (Costa & McCrae, 1992) is an accepted taxonomy of personality traits and is the dominant model for categorizing individual differences in personality (Ozer & Benet-Martinez, 2006). The model identifies five personality factors: extraversion (outgoing/energetic vs. solitary/reserved), agreeableness (friendly/compassionate vs. challenging/callous), conscientiousness (efficient/organised vs. extravagant/careless), neuroticism (sensitive/nervous vs. resilient/confident) and openness to experience (inventive/curious vs. consistent/cautious). These factors reflect an individual's characteristic patterns of thought, emotion, and behavior (Chamorro-Premuzic & Furnham, 2008; Costa & McCrae, 1992; Digman, 1990; McCrae & Costa, 1997).

The Big-5 International Personality Item Pool (IPIP; Goldberg, 1999), is one of the most popular

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tools that encompasses these five personality traits and has been used to understand the relationship between personality and various academic behaviors (Poropat, 2009). Said behaviors include academic achievement (Cazan & Schiopca, 2014), with conscientiousness consistently and positively associated with exam and essay performance (Heaven et al., 2007; O'Connor & Paunonen, 2007), whereas neuroticism has been found to be a negative predictor of academic performance (Laidra et al., 2007) and examination performance (Chamorro-Premuzic & Furnham, 2003). Poropat (2009) reports that agreeableness, conscientiousness, and openness are more generally associated with academic performance while results regarding extraversion are somewhat ambiguous (Wolf & Ackerman, 2005). Furthermore, Qureshi et al. (2016), who investigated whether personality traits modulate engagement with learning, found that students that scored high in extraversion, agreeableness, and conscientiousness also scored higher in general engagement, whereas those high in neuroticism and openness did not engage as well with learning. There is also evidence that conscientiousness and openness are related to higher student satisfaction for those online courses (Cohen & Baruth, 2017), although this study used correlational analysis to examine the data. As personality factors may play an important role in predicting academic behaviors and student satisfaction, the current study aimed to explore how personality predicts students' satisfaction using a more advanced analytical approach.

While it is expected that students' satisfaction in the 2019/20 and 2020/21 academic years will be lower compared to previous academic years, exactly how low or high it is may depend on many individual characteristics of the students, including their age (Radloff & Coates, 2010), gender, nationality (García-Aracil, 2009), and ethnicity (Rankin & Reason, 2005). Previous research examined the role of personality on multiple factors related to students' experiences, such as retention (Moses et al., 2011), students' engagement (Qureshi et al., 2016), and academic performance and achievement (Glass et al., 2013; Jensen, 2015). Research has also shown that personality traits differently predict adaptation to online courses during the pandemic – as such, openness to experiences was found to be highly related to increased engagement in online classes (Audet et al., 2021). However, to our knowledge, no research to date has examined how personality traits could predict students' satisfaction with various aspects of blended learning, rather than online learning.

Potential changes in student satisfaction could be explained by the expectancy/disconfirmation paradigm (Rust & Oliver, 1994). According to this framework, which was developed to explain customer's satisfaction with the service, satisfaction is a result of a consumers' experience being better or equal to predicted, and dissatisfaction is a result of the experience being worse than predicted (Arambewela & Hall, 2009). When expectations are not met, students may experience dissatisfaction with their course or university. Prior to the onset of the COVID-19 pandemic, students may have expected that their university experience would involve attending face-to-face lectures, integrating with the university community, and being able to use the necessary facilities. Thus, when universities were forced to suddenly switch to online learning in 2020 to reduce COVID-19 transmission, the expectations of many students may have not been met, which could have resulted in lower satisfaction levels. Furthermore, since the change was sudden, universities were not adequately prepared for the switch to online material delivery, which could have also affected students' satisfaction (Thomas & Galambos, 2004). The increase of online activities, and further digitalization of higher education, is another factor that has been linked to decreased students' satisfaction (Allen et al., 2002). Finally, as many students were not able to access necessary resources, such as computers, stable internet connection, or suitable workplaces, this may have led to further disappointment (Green et al., 2015). The sudden change in university experiences may have especially affected second and third-year undergraduate students, compared to first-year undergraduates, as they had prior university experience and may have had expectations that their experience would be the same as it was before. In accordance with the expectancy/disconfirmation paradigm, such expectations could lead to higher levels of dissatisfaction with the current experience.

The COVID-19 pandemic has presented certain obstacles to education systems (Daniel, 2020), and while most governments played catch-up to the exponential spread of the virus, many institutions had very little time to prepare for a remote-teaching regime (Daniel, 2020). Due to this, a blended learning model has since been adopted in HEI's across the UK for the 2020/21 academic year, with differing attitudes toward this amongst both academics and students, regarding the technological and pedagogical changes (Mozelius, 2020). Blended learning can be defined as the combination of face-to-face learning systems and online learning, synchronous or

asynchronous (Bernard et al., 2014). While blended learning may have its benefits, including extending the reach of material to a wider audience (e.g., students who would otherwise not be able to attend face-to-face sessions), and are associated with slightly better outcomes compared to face-to-face programmes (Bernard et al., 2014), the current pandemic climate may enhance its disadvantages. This could include not being able to access necessary facilities (Mavondo et al., 2004), not being able to follow the seminars, lectures, and other meetings due to poor internet connection (Lapitan et al., 2021), and limited interactions with tutors, lecturers, and students (Chiero et al., 2015; Fedynich et al., 2015). Additionally, potentially increased nonacademic responsibilities (e.g., childcare), may make it more difficult for students to complete certain tasks on time (e.g., to watch prerecorded lectures; Lapitan et al., 2021). While the blended learning model may lead to higher student satisfaction than the online model, students who are in their third year may remain dissatisfied as they may have preferred their prior experiences. If this is the case, then further adjustments may be needed for third-year students to increase satisfaction and retention. Yet, to our knowledge, no study to date compared the difference in satisfaction with blended learning between different year groups.

Student satisfaction is difficult to measure, with many researchers adapting questions to what is appropriate and relative to students at the time (Qureshi et al., 2016). With the COVID-19 pandemic acting as the main driver for many HEI's in the UK adopting the blended learning model in the 2020/21 academic year, the questions pertaining student satisfaction will be informed by HEI's pandemic response. Indeed, while the COVID-19 pandemic context is unique, the findings from the research on blended learning could be applied beyond the pandemic. Knowledge on the association between personality and students' satisfaction could help the universities to make decisions on whether it could be fruitful to offer blended and online modes of the courses to increase students' satisfaction, therefore positively impacting their TEF scores over time. Given the challenges that HEI's carry regarding student satisfaction and retention (Fowler & Boylan, 2010; Hazelkorn, 2015), which has been placed under further pressure since the COVID-19 pandemic (Daniel, 2020), the present study aimed to build on previous research on how Big-5 personality factors could be related to various students' outcomes and investigate whether personality traits can predict student satisfaction associated with blended models of learning.

Method

Participants

A convenience sample of UK undergraduate adult students was utilized. Seventy-eight students took part in the study, however, six were excluded from data analysis due to not completing the survey. This left 72 participants, with their ages ranging from 18 to 53 ($M=21.82$, $SD=6.02$). The sample was largely female ($N=61$, 85%), with the majority of the total sample studying a psychology-based degree ($N=38$, 53%). Over a third of students were in their first ($N=22$, 30.6%) and third ($N=30$, 41.7%) year of study, with the remaining in their second year ($N=19$, 26.4%) and one did not respond to this question. It must be noted that UK undergraduate degrees predominantly last three years.

After data collection was completed, sample size was calculated using G*Power 3.1.9.7 (Faul et al., 2007, 2009). Post-hoc calculations indicated that detecting an effect size of $f^2 = 0.25$ at $\alpha=0.05$ with 72 participants achieved adequate power ($\beta=0.9$). Therefore, the data were not underpowered.

Measures

General information questionnaire (GIQ)

The General Information Questionnaire (GIQ) was designed by the researchers for the present study to obtain relevant demographic variables from participants. These included sex, age, year of study, and academic course. Larger satisfaction and safety questionnaires were also incorporated into the GIQ. However, due to poor internal consistency scores of these tools, only overall satisfaction and safety scores were retained for data analysis. Overall satisfaction with teaching post-COVID-19 onset (1 – Completely Disagree, 2 – Disagree, 3 – Slightly Disagree, 4 – Neither Agree Nor Disagree, 5 – Slightly Agree, 6 – Agree, 7 – Completely Agree), and how safe students felt at university (1 – Very Unsafe, 2 – Moderately Unsafe, 3 – A Little Unsafe, 4 – Neither Safe Nor Unsafe, 5 – A Little Safe, 6 – Moderately Safe, 7 – Very Safe) were also recorded.

Big-5 international personality item pool (IPIP; Goldberg, 1999)

The Big-5 International Personality Item Pool (IPIP; Goldberg, 1999) was used to measure personality traits, requiring a response on a 7-point Likert scale (1 – Completely Disagree, 2 – Disagree, 3 – Slightly

Disagree, 4 – Neither Agree Nor Disagree, 5 – Slightly Agree, 6 – Agree, 7 – Completely Agree). The 50-item scale consisted of ten items measuring each of the five traits: Extraversion, Agreeableness, Conscientiousness, Openness, and Neuroticism. The IPIP relates strongly to major dimensions of personality and has shown good internal consistency (Gow et al., 2005). These were of $\alpha=0.91$ for extraversion, $\alpha=0.71$ for agreeableness, $\alpha=0.72$ for conscientiousness, $\alpha=0.87$ for neuroticism, and $\alpha=0.76$ for openness in the present study.

The measures used in the study could be found on Open Science Framework (https://osf.io/69qj3/?view_only=8a0a2145370643269fc17996da959832).

Procedure

Ethical approval was obtained from the Edge Hill University Research Ethics Committee. Advertising posters were displayed online. Potential participants were able to scan the QR code which redirected them to the information sheet and consent form, and, if they agreed to take part, they were subsequently redirected to questionnaires. Data were collected online using Qualtrics (Qualtrics, Provo, UT; Qualtrics, 2022). Participants were fully informed about the study via this online survey and their consent was recorded. This was followed by the participants completing the study questionnaires (GIQ & IPIP). After completing the last questionnaire, the debrief form was presented at the end of the survey. On average, the study took approximately 10 minutes to complete.

Ethical considerations

Study participation was voluntary. Participants had to sign an informed consent prior to taking part. All responses were collected anonymously. It was deemed unlikely that any questions would cause participants' distress. In the participant information sheet, they were advised about their rights, including their right to withdraw from participation without giving a reason. None of the participants withdrew from the study.

Data analysis

First, data were examined to make sure they met all necessary assumptions for using parametric tests. A correlation matrix was conducted. Then analysis of variance (ANOVA) was conducted to compare satisfaction with blended learning between year groups.

Regression analysis was conducted to assess whether personality predicts satisfaction with blended learning. Extraversion, Agreeableness, Conscientiousness, Openness, and Neuroticism were entered as predictors of overall satisfaction with blended learning. The dataset used could be found on Open Science Framework (https://osf.io/69qj3/?view_only=8a0a2145370643269fc17996da959832).

Results

See Table 1 for descriptive statistics and Table 2 for correlations between study variables.

A simple linear regression was conducted to predict student satisfaction of teaching approaches based on personality traits. A significant regression equation was found with personality traits explaining 18% of the variance in teaching satisfaction, $F(5, 66) = 2.88$, $p = .02$. Extraversion was a negative predictor of teaching satisfaction, $\beta = -.04$, $t = -2.25$, $p = .03$ and neuroticism predicted higher satisfaction with teaching, $\beta = .38$, $t = 2.03$, $p = .046$. Agreeableness ($p = .56$), conscientiousness ($p = .11$), and openness ($p = .09$) did not predict satisfaction with teaching. See Table 3 for the summary of the model. The analysis did not reveal significant differences between year groups (see Supplementary Materials).

Discussion

The aim of the present study was to identify whether certain personality traits predict higher student satisfaction with teaching practice since the COVID-19 pandemic in UK universities. Findings revealed that extraversion negatively predicted satisfaction with teaching and neuroticism predicted higher satisfaction with teaching. There were no significant findings with agreeableness, conscientiousness, and openness personality traits. As using a blended model is relatively new within higher education, there are currently few findings on how personality traits predict student satisfaction. Our study found that low extraversion and high neuroticism predict higher levels of student satisfaction, where other Big-5 personality traits were not predictive of student satisfaction. This is

Table 1. Descriptive statistics of study variables.

Variable	<i>N</i>	<i>M</i>	<i>SD</i>	Range
Extraversion	72	43.10	11.90	18–64
Agreeableness	72	57.85	6.29	41–70
Conscientiousness	72	49.46	7.83	28–63
Neuroticism	72	34.40	11.31	13–59
Openness	72	49.65	7.79	28–66
Satisfaction	72	4.68	1.77	1–7

Table 2. Correlation between study variables.

Variable	Sex	Age	Year of Study	Course	Extraversion	Agreeableness	Conscientiousness	Neuroticism	Openness	Satisfaction
Sex	—	—	—	—	—	—	—	—	—	—
Age	.047	—	—	—	—	—	—	—	—	—
Year of Study	-.127	-.115	—	—	—	—	—	—	—	—
Course	.062	.083	-.504**	—	—	—	—	—	—	—
Extraversion	-.032	-.208	.078	-.185	—	—	—	—	—	—
Agreeableness	.082	.321**	.141	-.094	-.144	—	—	—	—	—
Conscientiousness	.070	.060	.076	-.102	.019	.186	—	—	—	—
Neuroticism	-.304**	.235	.299*	-.154	.204	.004	.280*	—	—	—
Openness	-.254*	.231	.086	-.136	.171	.216	-.127	.106	—	—
Satisfaction	-.165	.177	.050	.050	-.165	.050	.220	.267*	.148	—

* $p < .05$, ** $p < .01$.

Sex is coded as 1 male, 2 female. Course is coded as 1 psychology, 2 non-psychology.

Table 3. Predictors of satisfaction with blended learning.

Model	B	SE	B	t	p
H1 (Intercept)	1.67	2.42		0.69	.492
Extraversion	-.04	0.02	-.026	-2.25	.028*
Agreeableness	-.02	0.03	-.07	-0.50	.557
Conscientiousness	0.04	0.03	0.20	1.62	.109
Neuroticism	0.04	0.02	0.24	2.03	.046*
Openness	0.05	0.03	0.21	1.73	.087

somewhat in contrast with previous studies, such as that of Kim et al. (2014), who found that extraversion was associated with increased student satisfaction, although their study used Myers-Briggs Type Indicator to examine personality, a measure which has shown to lack psychometric support (King & Mason, 2020). This could be a reason for differential findings. Our results are also in contrast with those by Cohen and Baruth (2017), who found that conscientiousness and openness are associated with higher levels of student satisfaction with online courses. However, their study used correlational design and therefore causation could not be inferred from their findings; in fact, findings from our correlation analysis demonstrated a similar pattern with trait openness. Our findings are also in contrast with meta-analysis by Trapmann et al. (2007) found that neuroticism is associated with decreased academic satisfaction. The differences between our findings and those of previous research could be explained by social factors, which are particularly relevant during the time of social isolation due to COVID-19 restrictions (Pietrabissa & Simpson, 2020). It could be that students that had high scores of neuroticism or low scores of extraversion preferred the lesser social interaction that was adopted in the blended model in this academic year. In line with that, previous research showed that neuroticism is associated with higher levels of anxiety during the COVID-19 pandemic (Pérez-Mengual et al., 2021). The flexibility of being able to contribute to lectures and seminars, when one wishes to, and not visible to peers, could explain the higher levels of student satisfaction in those with low scores of extraversion and

high scores of neuroticism. From this, a blended model could be used in future whereby face-to-face teaching and remote learning is used simultaneously to improve the student experience depending on personality type. This can improve student satisfaction, and therefore, NSS and TEF scores that are all-important to HEI's.

That said, the current study is not without limitations. The sample size is small, includes predominantly psychology students, and is mostly female and should therefore be interpreted with caution. However, research has shown that the perception of quality of learning experience in students in blended learning environments is the same for both males and females (Savara & Parahoo, 2018). Additionally, the typical drawbacks of self-reports pose a threat to the validity and reliability of the data as does the cross-sectional nature of the questionnaires (Levin, 2006). However, reliability analyses revealed acceptable internal consistency scores, and therefore the data can be considered reliable albeit a snapshot of the participants' lives when taking part. Furthermore, personality predictors of satisfaction with blended learning may be different outside of the global pandemic context. Therefore, the study's findings are only generalizable to the current time. Finally, there was an overrepresentation of psychology students in our sample.

Implications

The information provided in this study could be used to increase overall student satisfaction by incorporating both online and face-to-face teaching options to students. While some students prefer to attend face-to-face session and interact with each other and their tutor, others may have increased anxiety about this activity. Given that the findings of the study suggested that personality accounted for 18% of the student satisfaction, personality factors are important to account for. Therefore, from the perspective of maintaining high student satisfaction and providing it is safe to do so, it may be beneficial for

the universities to invest in giving students a choice on whether to enroll on online, blended, or face-to-face modes of the course. This way, students' satisfaction with their course and with their university would potentially increase.

Conclusions & future directions

In conclusion, we found that extraversion predicted decreased satisfaction with blended learning, while neuroticism predicted increased satisfaction with it, which could be explained by the current pandemic context. These findings could help educators to adapt learning approaches to increase student satisfaction.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Data availability statement

Data related to this submission can be found at the Open Science Framework: https://osf.io/69qj3/?view_only=8a0a2145370643269fc17996da959832

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