Internet addiction, academic performance and personality traits: A correlational study among female university students

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Abstract. This study examines the relationship of Internet addiction with personality, academic performance, and Internet self-efficacy in the context of higher education. In addition, the study investigates the relationship between two questionnaires that measure Internet addiction: the Internet Addiction Test (IAT) and the Online Cognition Scale (OCS). The study sample was 110 Greek female students at their second year of studies in Educational Sciences. Participants completed the following questionnaires: Internet Self-efficacy (ISE), Big Five Personality Test (Big Five), Internet Addiction Test (IAT) and Online Cognition Scale (OCS). Questions on participants' demographics and Internet usage experience were also used. A moderate negative significant correlation was found between personality and Internet addiction. The highest magnitude of this negative correlation was observed for the Big Five emotional stability trait. Internet addiction didn't significantly correlate with academic performance, nor did it significantly correlate with Internet self-efficacy. Moreover, no significant correlation was found between academic performance and Internet self-efficacy. Finally, a strong positive significant correlation was found between IAT and OCS.

Keywords: Internet addiction, Internet addiction test, Big Five Personality Test, Internet Self-Efficacy, Online Cognition Scale.

Introduction

The Internet has become part of most peoples' everyday life activities. People of all ages devote many hours online today. Along with all the benefits Internet brings, problems of excessive Internet use are becoming apparent. Internet addiction (Young, 1998) refers to excessive Internet use that interferes with daily life.

Internet addiction has not yet been recognized as a clinical condition in the Diagnostic and Statistical Manual of Mental Disorders (DSM-V, latest revision on 2013) published by the American Psychological Association. However, Internet addiction is a problem of modern societies and many studies (Kuss, Griffiths, & Binder, 2013; Landers & Lounsbury 2006; Engelberg & Sjöberg, 2004; Griffiths, 2000a, 2000b, 2000c) have considered this issue, mainly aiming to identify its causes, symptoms and effects.

Theoretical background

In the literature, various terms are being used to describe the phenomenon of being addicted to Internet use. Examples of such terms are the following: "Internet Addiction Disorder" (Douglas et al., 2008), "Pathological Internet Use" (Young, 2007;

Davis, 2001), "Problematic Internet Use" (Caplan, 2002; Davis, Flett, & Besser, 2002), "Compulsive Internet Use" (Widyanto & Griffiths, 2006), "Cyberspace Addiction" (Suler, 2004), "Internet Dependence" (Young 1996), "Internet Overuse" (Whang, Lee, & Chang, 2003), "Misuse of Internet" (Greenfield & Davis, 2002), and "Internet Behavior Dependence" (Hall & Parsons, 2001).

Ivan Goldberg, was the first one that referred to the concept of Internet addiction on 1996. He applied DSM criteria used for substance addiction, replacing the term "substance" with the term "Internet". However, the term "Internet addiction" was established two years later by the psychologist Kimberly Young, who identified pathological Internet use based on characteristics that were common with pathological gaming.

Davis (2001) was the first to differentiate between two types of pathological Internet use. On the one side, the Specific Pathological Internet Use (SPIU), which is a type of Internet addiction where people pathologically engage in a specific function or application of the Internet (e.g., banking, shopping, gambling, gaming). On the other side, he considers the Generalized Pathological Internet Use (GPIU) where individuals pathologically use the Internet without having a specific goal. In the same year, Hall and Parsons (2001) argued against the pathological root for Internet addiction and provided the new term "Internet Behavior Dependence (IBD)" defining it based on cognitive-behavioral criteria consistent with a developmental approach. Beard (2005) proposed a more holistic definition supporting that one's mental state, which includes mental, emotional, educational and social activities, is impeded by excessive Internet use. Rice (2006) defined Internet addiction as the tendency towards forced Internet use that impedes a person's normal life.

Internet addiction may affect one's personal, social and professional life activities (Engelberg & Sjöberg, 2004; Griffiths 2000a). First, prolonged Internet use may result in lack of sleep, which in turn provokes a feeling of fatigue and negatively affects one's immune system. In addition, sitting in front of a computer screen for many hours may result in physical pain and injuries (e.g. back pain, wrist tendonitis, blurry vision, headache) and disordered eating habits related to obesity or anorexia. Excessive Internet use might also lead to social isolation, aggressiveness, difficulties in communication with other people, and depression. Young (1996) found that excessive Internet use resulted in academic performance deterioration, even for students who previously had excellent grades. Furthermore, Internet addiction may negatively affect a person's professional life due to lack of concentration, social isolation from co-workers etc. (Engelberg & Sjöberg, 2004).

There are several factors that may contribute to Internet addiction. These factors are related to both one's social environment and psychological state (Hur, 2006). In specific, Internet addiction is often firstly observed in young age, during which one is highly curious and wants to experiment with new technology. The continuous increase in the number of single-parent families and the increasing number of parents who work most hours of the day may be partly responsible for children's unsupervised overuse of the Internet (Kuss, Van Rooij, Shorter, Griffiths, & van de Mheen, 2013). In addition, many youngsters make excessive Internet use due to factors related to following new trends (e.g. latest online game or application) in

their social environment (Kuss, Van Rooij et al., 2013; Kuss, 2016). Psychopathological disorders, such as anxiety, depression, and mood disorders as well as personality characteristics may also contribute to Internet overuse in all age groups (Cheung & Wong, 2011; Mottram & Fleming, 2009; Pies, 2009; Xu et al., 2012). Internet anonymity, faceless communication and the option to adopt a different identity tend to support people with such disorders to feel more secure and express themselves better online than offline, and this may result in Internet addiction (Amichai-Hamburger, Wainapel, & Fox, 2002). Factors related to one's social context, such as social isolation and loneliness, are also related to Internet addiction (Amichai-Hamburger et al., 2002). Caplan (2003) results showed that loneliness was a more important predictor of problematic Internet use compared to depression.

Various studies have demonstrated a link between personality traits and Internet addiction. Personality traits represent generally enduring characteristics of individuals expressed in a wide range of situations. They have been found to be associated with a large set of human activities, such as academic achievement and job performance (Landers & Lounsbury, 2006). In the literature, Big Five constructs of personality namely Openness, Conscientiousness, Extraversion, Agreeableness, and Neuroticism are widely accepted as a valid and reliable framework to represent personality traits. Higher scores on neuroticism and lower scores on either agreeableness or extraversion seem to correlate with higher Internet addiction probability (Kuss et al., 2013; Kuss et al., 2014). Moreover, higher neuroticism scores seem to be a predictive factor of various abusive symptoms.

This study focuses on investigating higher education students' behavior, since it is widely accepted (Kuss et al. 2014; Nalwa & Anand, 2004; Odacı & Kalkan, 2010) that they constitute a risk population. They seem to have a natural Internet affinity, flexible schedule, and free/non-limited access. In addition, students tend to develop their identities and start to seek for intimate relationships, which in turn increase their Internet use to form new relationships and seek for related information. Earlier studies (Kuss et al., 2014) seem to have focused on male Internet users, partly due to their rapid adoption during the first Internet years. However, nowadays, it is widely accepted that female users constitute an increasing fraction of the Internet population and in some countries they surpass male users. This study investigates Internet addiction in female university students, a rather unexplored issue in the literature.

Furthermore, instead of using only the Internet Addiction Test (Young, 1998), the Online Cognition Scale (Davis et al., 2002) is also adopted, in order to further examine the psychometric properties of both questionnaires in the context of this correlational study in higher education. IAT's reliability and validity is well documented in the literature. However, OCS is rarely used to associations between Internet addiction and users' personality traits; the sole study we have found is Durak & Senol-Durak, 2014.

Finally, it is attempted to explore the impact of female students' Internet self-efficacy on excessive Internet use. Self-efficacy was defined by Bandura (1994) as the belief of people about their ability to attain designed levels of performance. In general, people avoid tasks where self-efficacy is low, but engage in tasks where self-efficacy is high. Choices affecting health, such as smoking, physical exercise, dieting,

and dental hygiene are dependent on self-efficacy (Schwarzer & Jerusalem, 2010). Internet self-efficacy is defined as 'the beliefs in one's capabilities to organize and execute courses of Internet actions required to produce given attainments' (Eastin & LaRose, 2000). However, the link between Internet self-efficacy and addiction, if any, is not adequately explored. Craparo et al. (2014) in a study of 670 college students, found no link between Perceived Social Self-efficacy Scale, Perceived Self-efficacy in handling Negative Emotions Scale and Internet Addiction Test. On the contrary, İskender and Akin (2010) found that Internet addiction was explained negatively by social self-efficacy.

Research goals and questions of this study

The goal of this paper is twofold: (a) to investigate associations (if any) among Internet addiction, personality, academic performance and Internet self-efficacy of female students in higher education, (b) to examine the relationship between two questionnaires that measure problematic Internet use: the Internet Addiction Test (IAT) and the Online Cognition Scale (OCS). The research questions of this study are the following:

RQ1: Is there any relationship between Internet addition and personality traits of female higher education students?

RQ2: Is there any relationship between Internet addition and academic performance of female higher education students?

RQ3: Is there any relationship between Internet addition and Internet self-efficacy of female higher education students?

RQ4: Is there any relationship between Internet self-efficacy and academic performance of female higher education students?

RQ5: Is there any relationship between the Internet Addiction Test and the Online Cognition Scale?

The rest of the paper is organized as follows: First, the study methodology, the profile of the participants, research materials and procedures are delineated. Subsequently, the statistical analysis of the collected data and the study findings are described. The paper concludes with a discussion and directions for future research.

Method

Participants

The study involved 121 second-year students of the "Information and Communication Technology in Education" class at the Department of Educational Sciences and Early Childhood Education of the University of Patras. Of these participants, 10 did not complete one or more of the study questionnaires and one participant answered that he was male and was excluded. Thus, the sample size for this study is 110 female students. The participating students ranged in age from 19 to 50 years old with an average age of 20.79 years (SD = 3.99).

Most participants (97.3%) stated that they have Internet connection at their home. In addition, 81.1% of the students accessed the Internet through their smartphones. Students reported using the Internet for an average of 6.5 years (SD = 2.9), almost on a daily basis (on average 6.4 days per week, SD = 1.2) and on average 4.2 hours per day (SD = 2.5). Regarding activity performed online, students stated that they most frequently use the Internet for their studies, communication through email or social networks, entertainment and being informed about the news.

Participation was voluntary, and students were free to terminate their participation at any time. Student participation was not compensated with either money or course credit.

Instruments

This study employed existing measures of Internet addiction, personality, and Internet self-efficacy. We also used an additional questionnaire to collect demographic-related information. Students' academic performance was operationalized using their mean academic grade.

Internet Addiction Test (IAT): The IAT (Young, 1998; Widyanto, & McMurran, 2004) is a reliable and valid instrument for measuring addiction to the Internet. It consists of 20 questions with answer choices on a 1 (Never) to 5 (Always) scale. The IAT score is produced by simply summing up the responses and it ranges from 20 to 100; the higher the IAT score the more addicted to the Internet one is. Young (1998) suggests that an IAT score from 20 to 39 is an average online user who has complete control over his/her Internet use, a score from 40 to 69 signifies frequent problems due to Internet use, and a score from 70 to 100 is a user confronting serious problems on his/her life due to Internet use. Studies report high reliability for the IAT instrument in various languages and for various participants' ages; Cronbach's alpha ranging from 0.63 to 0.93 (Khazaal et al., 2008; Ngai, 2007).

Online Cognition Scale (OCS): The OCS was developed by Davis, Flett and Besser (2002) to measure problematic Internet use. The questionnaire focuses on cognitions rather than on behaviors. It has been also used in measurements related to loneliness, spontaneousness and pathological gambling. It includes 36 questions with answer choices on a 1 (Strongly disagree) to 7 (Strongly agree) scale. Score on the OCS is obtained by summing up the responses and it ranges from 36 to 252; the higher the OCS score the more problematic one's Internet use is considered. Contrary to the IAT, the OCS does not provide cut scores. The OCS consists of four dimensions: social comfort, loneliness/depression, diminished impulse control, and distraction. A high level of internal reliability has been found (Davis, et al., 2002) for both the overall scale (Cronbach's alpha = 0.94) and its four subscales: social comfort (0.87), loneliness/depression (0.77), diminished impulse control (0.84), and distraction (0.81).

Big Five Personality (Big Five) test: The Big Five instrument (Goldberg, 1993) is used to measure one's personality. It uses five dimensions of personality: Extraversion, Agreeableness, Conscientiousness, Emotional Stability, Openness to Experience. The

instrument includes 50 questions that can be answered on a scale from 1 (Strongly disagree) to 5 (Strongly agree). Some questions are positive statements (e.g. "I am the life of the party"), whereas the rest are negative statements (e.g. "I do not have a good imagination"). Answers are scored either positively or negatively depending on the personality trait, and they are then summed up to produce a score per personality trait. The overall Big Five score is obtained by summing up the scores for each personality trait. The Big Five is a widely-used, valid and reliable psychometric test for measuring personality (Goldberg, 1993).

Internet Self-Efficacy (ISE) questionnaire: The ISE questionnaire (Hsu & Chiu, 2004) captures the beliefs in one's personal capabilities to achieve specific goals with the Internet. It includes 19 questions with answer choices on a scale from 1 (Strongly disagree) to 5 (Strongly agree). The ISE construct is obtained by taking the mean score of one's responses and thus ranges from 1 to 5; the higher the ISE score the higher one's perceived self-efficacy with the Internet. According to a study involving 420 participants (Hsu & Chiu, 2004), the instrument is both valid and reliable (Cronbach's alpha = 0.95).

Demographic questionnaire: The demographic questionnaire asked participants about personal attributes (gender, age). In addition, respondents were asked to report their mean academic grade. They also provided information related to their connection to the Internet (access at home, access through smartphone), and behaviors related to Internet use (number of years using the Internet, number of days per week online, average number of hours online, and type of online activity).

Procedures

Students were first presented with the study goal during one of their lab courses and they were asked to volunteer for the study. Then, the participating students completed an informed consent form affirming that their completion of the survey was entirely voluntary and that all responses would remain anonymous. The study questionnaires were distributed online using the SurveyMonkey service. Respondents were asked to complete them at home during the next five days. All students completed the questionnaires in the same order. Participants required on average 25 minutes for completing the study questionnaires. The collected data were extracted from the SurveyMonkey service and were analyzed using IBM SPSS Statistics v20.0.

Results

Table 1 presents descriptive statistics for the variables measured in this study. All in all, 90 (81%) participating students were average Internet users (IAT score from 20 to 39) and 21 (19%) of them were users with frequent problems due to Internet use (IAT score from 40 to 69). No student confronting serious problems on his/her life due to Internet use was found (IAT score from 70 to 100).

Reliability analysis of the study questionnaires

Participating students were presented with the questionnaires translated in their native language by the authors, who were also native speakers of the language. This decision was made in an attempt to minimize potential threats to the reliability of responses obtained from non-native English speakers (Finstad, 2006). Reliability refers to the extent to which an instrument such as a questionnaire yields the same results under consistent conditions (Nunnally & Bernstein, 1994). It is most commonly measured using Cronbach's alpha which is a measure of internal consistency.

Reliability analysis was conducted for the four translated versions of the questionnaires used in this study. For the needs of the reliability analysis, the negative statements of the Big Five Personality Test were recoded so that positive responses were associated with a larger number, like the positive statements.

Results showed that the Internet Addiction Test had good internal consistency; Cronbach's alpha = 0.89. A high level of internal reliability was also found for both the overall Online Cognition Scale (Cronbach's alpha = 0.93) and its four subscales: Social Comfort (0.84), Loneliness/Depression (0.78), Diminished impulse control (0.77), and Distraction (0.91). In addition, an adequate level of internal reliability was found for both the overall Big Five Personality Test (Cronbach's alpha = 0.81) and its five subscales: Extraversion (0.72), Agreeableness (0.67), Conscientiousness (0.77), Emotional Stability (0.79), and Openness to Experience (0.77). Similarly, the Internet Self-Efficacy questionnaire was highly reliable in the context of this study; Cronbach's alpha = 0.91.

Table 1. Descriptive statistics of the study variables (Sample size N = 110 female university students)

Variable	M	Mdn	SD	95% CI
Internet Addiction Test (IAT)	32.7	31.0	9.0	[31.0, 34.4]
Online Cognition Scale (OCS)-Total	78.2	74.0	26.5	[73.5, 83.5]
OCS-Social Comfort	24.5	22.0	9.3	[22.9, 26.5]
OCS-Loneliness/Depression	13.0	12.0	5.9	[11.9, 14.2]
OCS-Diminished Impulse Control	22.3	20.0	8.2	[20.8, 23.9]
OCS-Distraction	18.5	17.0	7.9	[17.0, 20.0]
Big Five Personality Test (Big Five)-Total	180.0	181.0	16.3	[177.0, 183.0]
Big Five-Extraversion	34.3	34.0	6.0	[33.1, 35.4]
Big Five-Agreeableness	43.2	44.0	3.6	[42.6, 43.9]
Big Five-Conscientiousness	36.7	37.5	6.2	[35.6, 37.9]
Big Five-Emotional Stability	30.4	30.0	7.1	[29.0, 31.7]
Big Five-Openness to Experience	35.4	35.0	5.7	[34.4, 36.5]
Academic Performance (Mean Grade)	7.1	7.2	0.9	[6.9, 7.3]
Internet Self Efficacy (ISE)	3.9	3.8	0.5	[3.8, 4.0]

RQ1: Internet addiction and personality traits

Spearman correlation analysis explored the relationship between IAT score and Big Five score, and between OCS score and Big Five Score. A non-parametric test

was selected because both IAT score and OCS score violated the assumption of normality; D(110) = 0.905, p < .001 and D(110) = 0.955, p < .001 respectively.

Results showed a moderate negative significant correlation between the IAT score and Big Five score; r_s = -.388, p < .01. In addition, a moderate negative significant correlation between Internet addiction, as measured by IAT, and both the consciousness and emotional stability personality traits was found; r_s = -.291, p < .01 and r_s = -.305, p < .01 respectively. No significant correlations were found between IAT score and the rest three Big Five personality traits (extraversion, agreeableness, openness to experience).

Results also showed that OCS correlated moderately, negatively and significantly with Big Five score; r_s = -.424, p < .01. In addition, the relationship between OCS score and personality traits was explored. A moderate negative and significant correlation was found between OCS and emotional stability; r_s = -.345, p < .01. In addition, problematic Internet use, as measured by OCS, and both consciousness and openness to experience correlated weakly, negatively and significantly; r_s = -.211, p < .05 and r_s = -.211, p < .05 respectively. No significant correlation was found between OCS score and both extraversion and agreeableness as measured by Big Five. Table 2 presents the correlations among OCS subscales and Big Five personality traits. In sum, it was found that:

- Extraversion correlated weakly, negatively and significantly (p < .05) with only the diminished impulse control subscale of the OCS.
- Agreeableness did not correlate significantly with any of the four OCS subscales.
- Conscientiousness correlated moderately, negatively and significantly (p < .01) with the distraction OCS subscale. Conscientiousness also correlated weakly, negatively and significantly (p < .05) with OCS loneliness/depression.
- Emotional stability correlated moderately, negatively and significantly (p < .01) with OCS social comfort, OCS loneliness/depression, and OCS diminished impulse control. Emotional stability also correlated weakly, negatively and significantly (p < .05) with OCS distraction.
- Openness to experience correlated weakly, negatively and significantly (p < .05) with the loneliness/depression and diminished impulse control subscales of the OCS.

Table 2. Spearman correlations among OCS subscales and Big Five personality traits

Big Five Personality Trait	OCS Subscale			
	Social Comfort	Loneliness/ Depression	Diminished Impulse Control	Distraction
Extraversion	-.129	-.141	-.192*	-.128
Agreeableness	.058	.111	-.004	-.112
Conscientiousness	-.082	-.192*	-.162	-.325**
Emotional Stability	-.317**	-.304**	-.297**	-.217*
Openness to Experience	-.122	-.194*	-.254**	-.185

*p < .05, 2-tailed **p < .01, 2-tailed

These findings suggest that Internet addiction is related to female students' personality. In addition, certain personality traits, i.e. emotional stability and consciousness, seem to play a more important role in this relationship.

RQ2: Internet addiction and academic performance

Spearman correlation analysis was used to investigate the relationship between IAT score and students' mean academic grade, and between OCS score and students' mean academic grade. Non-parametric analysis was used because all three variables deviated significantly from a normal distribution; Shapiro-Wilk tests, $p < .001$.

No significant correlation was found between Internet addiction, as measured either by IAT or OCS, and students' academic performance as measured by their mean grade. In addition, students' mean academic grade did not significantly correlate with any of the OCS subscales.

These findings indicate that female students' Internet addiction and academic performance are not related.

RQ3: Internet addiction and Internet self-efficacy

Spearman correlation analysis explored the relationship between IAT score and ISE score, and between OCS score and ISE score. Non-parametric analysis was used because both the IAT and OCS scores deviated significantly from a normal distribution; $D(110) = 0.905$, $p < .001$ and $D(110) = 0.955$, $p < .001$ respectively.

Results showed that neither IAT score nor OCS score correlated significantly with ISE score. Furthermore, no significant correlation was found between students' Internet self-efficacy, as measured by their ISE score, and the OCS subscales.

These findings tend to show that Internet addiction and female students' Internet self-efficacy are not related.

RQ4: Internet self-efficacy and academic performance

Spearman correlation analysis investigated the relationship between students' Internet self-efficacy (ISE score) and their academic performance (mean grade). Non-parametric analysis was used because the mean academic grade violated the assumption of normality; $D(110) = 0.695$, $p < .001$.

No significant correlation was found between ISE score and mean academic grade. Thus, female students' Internet self-efficacy and academic performance appear to be two unrelated constructs in this study.

RQ5: Internet Addiction Test and Online Cognition Scale

Spearman correlation analysis was used to investigate the relationship between IAT and OCS, two questionnaires that measure problematic Internet use. A non-parametric test was selected because both the IAT and OCS scores deviated significantly from a normal distribution; $D(110) = 0.905$, $p < .001$ and $D(110) = 0.955$, $p < .001$ respectively. Results showed a strong positive significant correlation between IAT score and OCS score; $r_s = .708$, $p < .01$.

An additional spearman correlation analysis was used to investigate the relationship between IAT and each of OCS subscales. A non-parametric test was selected because all five variables violated the assumption of normality; Shapiro-Wilk tests, p < .001. It was found that IAT score correlated strongly, positively and significantly (p < .001) with all OCS subscales: social comfort (r_s = .502), loneliness/depression (r_s = .592), diminished impulse control (r_s = .665), and distraction (r_s = .655) respectively.

These findings suggest that both questionnaires measure the same construct. They also provide evidence for the validity of the four OCS subscales.

Discussion and Conclusions

This paper reports a correlational study investigating the interplay among Internet addiction, personality, academic performance and Internet self-efficacy of female students in higher education. In addition, the paper examines the relationship between two questionnaires that measure problematic Internet use: IAT (Young, 1998) and OCS (Davis et al., 2002). One hundred and ten second-year female university students completed the questionnaires.

The results showed a moderate negative significant correlation between Internet addiction and personality. This association was mostly mediated by the emotional stability and conscientiousness personality traits. Durak and Senol-Durak (2014) also found that these two personality traits were related to OCS scores in a sample of 494 Turkish university students. High neuroticism has been linked with Internet addiction in numerous studies (Durak & Senol-Durak, 2014; Kayiş et al., 2016; Kuss et al., 2014), Also, in agreement to other studies (Durak & Senol-Durak, 2014; Landers, & Lounsbury, 2006; Kayiş et al., 2016), a medium negative correlation between conscientiousness and Internet addiction score was established. Low conscientiousness has been also linked with excessive Internet use as well as increased usage of social networking sites (Wilson, Fornasier, White, 2010; Stieger, Burger, Bohn, & Voracek, 2013). In addition, this study found that Internet addiction was not significantly associated with female students' academic performance (demonstrated in other studies involving both male and female participants, see Kuss et al., 2014) or Internet self-efficacy. Academic performance and Internet self-efficacy were also not significantly correlated. This finding is in agreement with previous studies (DeTure, 2004; Puzziferro, 2008) reporting no association between online technologies self-efficacy and student performance. Finally, a strong positive significant correlation was found among IAT, OCS and the four OCS subscales.

This study is not without limitations. First, all participants were students in one specific university department. This limits the generalizability of results to (greek) higher education students in general. Additional studies, involving students from different disciplines and geographical regions, are required to alleviate this concern. Furthermore, the instruments used in this study were translated in students' native language. Analysis showed that the translated questionnaires had adequate reliability apart from agreeableness subscale of the Big Five Personality Test; Cronbach's alpha = 0.67 < 0.70 (Nunnally & Bernstein, 1994). Thus, any findings related to this personality trait should be treated with care. In addition, the observed

strong correlation among IAT, OCS and its four subscales tends to provide support for the validity of these two questionnaires in the context of higher education. However, the validity of the rest two translated questionnaires (Big Five and ISE) could not be investigated in the context of this study.

Further studies are needed to verify and extend the presented results. In specific, it is important to examine if the observed relationships can be replicated in both similar and different settings. It would be also interesting to investigate the same research questions for male students and compare findings. Our future work also involves exploring the interplay between Internet addiction, personality traits and perceived usability of learning technologies, such as Learning Management Systems (Katsanos, Tselios, & Xenos, 2012; Orfanou, Tselios, & Katsanos, 2015) platforms for Massive Open Online Courses (Tsironis, Katsanos, Xenos, 2016) and wiki technologies (Altanopoulou, Tselios, Katsanos, Georgoutsou, Panagiotaki, 2015; Tselios, Altanopoulou, & Katsanos, 2011).

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