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Facebook Use, Personality Characteristics and Academic Performance:
A Case Study

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ABSTRACT

The present article examines the relationship between student personality, use of social media and their academic performance and engagement. Specifically, this article examines the relationship of students' Facebook (FB) use and personality characteristics using the Big Five Personality Test. This is focused on (a) student engagement; (b) time spent preparing for class; (c) time spent in co-curricular activities; and (d) academic performance. 204 higher education students participated in the study. Results illustrate that FB time was significantly positively correlated to student engagement and time spent preparing for class. Sharing links activity was positively correlated with student engagement and playing FB games with time spent preparing for class. However, sending private messages and status updates were significantly negatively correlated with student engagement and time spent preparing for class. Also, viewing videos was negatively correlated with time spent in co-curricular activities. Chatting on FB and viewing photos found to be the most popular activities. Moreover, students' extraversion, conscientiousness, openness to experience were positively correlated to student engagement. In addition, extraversion had a positive relationship with time spent in co-curricular activities, although agreeableness had a negative relationship. Implications of the study for the instructors and the students are also discussed.

KEYWORDS

Academic Performance, Big Five Personality Test, Facebook, Student Engagement, Tertiary Education

INTRODUCTION

The last few years, an important penetration of the Web 2.0 technologies in different aspects of the socio-economic activities has been observed (Straus et al., 2014, Orfanou, Tselios, & Katsanos, 2015, Katsanos, Tselios, & Xenos, 2012). Junco and Cole-Avent (2008) examined the technologies used by students. Some of these are already been used (e.g. FB) or present the potential to be used to enhance students' learning experience. In specific, the technologies which can be used for educational purposes are the following: social media (such as FB, myspace), blogs, other services that permit the user to create context (i.e. YouTube, Picasaweb), instant messages using FB and myspace, cell phones and virtual worlds (Junco & Cole-Avent, 2008).

Nowadays, social networks such as Facebook, and Twitter constitute a part of the citizens' daily life in the modern societies. According to Junco (2014a, p. 6), social networks are considered as implementations, services and systems that let the user create and share data with other users. Social

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networks replaced to a great extent, message sending and phone calls. Digital devices are being used especially from youngsters for the use of the social networks which help them communicate with each other almost instantly and with low cost.

Ellison, Steinfield, and Lampe (2007) investigated the relationship between FB use and the formation and preservation of the social capital. They found a strong relation between FB use and the three types of social capital (bridging, bonding, and maintained). Furthermore, they found that FB use interacts with measures of the phycology health, suggesting that is possible to offer bigger advantages for the users that present low self-confidence and satisfaction in life (Ellison, Steinfield, & Lampe, 2007).

Moreover, social networks are extensively used in educational settings (Altanopoulou, Tselios, Katsanos, Georgoutsou, & Panagiotaki, 2015, Lopes, Fidalgo-Neto, & Mota, 2017). However, their ever-increasing use has received some forms of criticism. The claim that the use of social networks in education involves many risks in students' performance is widespread. However, this is mainly attributed to the way students use them and not to their inherent nature (Junco, 2014a). One peril is called "multitasking", namely the execution of many actions at the same time, for instance sending a message to a friend while studying for an examination (Junco, 2014a). Other risks which can lead to lower student performance are using the laptop computer, sending instant messages and carrying out specific actions on FB during the lesson or while completing a learning task (Junco, 2014a). Moreover, Junco and Cotten (2011) found that extensive use of instant messaging had a negative effect on their academic tasks. The risks, which were referred above, may be some of the reasons that some teachers possess the perception that social networks, especially FB, have a detrimental effect on students' academic performance.

To further explore the issue, Junco and Cotten (2012) examined the effect of multitasking on educational results. The aim was to investigate how students interact with the technologies of information and communication (ICT's) and the effect of ICT use on students' GPA (Junco & Cotten, 2012). It was demonstrated that students spend enough time using ICT's, on which they don't search for context related to the modules but use FB, email, instant messages, talk on their cell phones and text, while doing schoolwork (Junco & Cotten, 2012). By using hierarchical regression, it was found that using FB and texting while doing homework were negatively associated with overall college GPA.

In a study conducted by Junco (2014b), a tool was used to record and examine what students actually do when they are using the internet. He gathered data related to their actions by using a data logging tool in students' computer (Junco, 2014b). The results show that students used FB frequently and that many of them regulated their computer use to enhance their academic performance (Junco, 2014b). Thus, negative attitude of some educators towards social networks sometimes originates from the fact that they don't get accustomed to technology and it is not founded on concrete evidence (Junco, 2014a). On the other hand, there are organizations which use social networks to communicate with their students and provide help. Moreover, a lot of instructors use them to inform their students via twitter for opportunities such as available work positions (Junco, 2014a).

FACEBOOK USE AND ACADEMIC PERFORMANCE: LITERATURE REVIEW

Engaging in Facebook use or texting while trying to complete schoolwork may impair students' capacity for cognitive processing and preclude deeper learning (Junco & Cotten, 2012). However, emailing, talking on their cell phones and instant messaging is not correlated with GPA (Junco & Cotten, 2012). They concluded that multitasking isn't an inherent burden on student results but it depends on the type and the aim of ICT's usage, while doing schoolwork. (Junco & Cotten, 2012).

Junco (2012b) examined the relationship between multiple indicators of FB use and academic performance. In specific, by using a hierarchical regression analysis he showed that the relationship between FB time and college grade point average (GPA) is statistically significant, as the followings relationships: frequency of which entered FB and college grade point average, time spend on FB

and time spent preparing for class, frequency of which entered FB and time spent preparing for class (Junco, 2012b). It was found that time spend on FB and frequency of which entered FB was negatively related to GPA (Junco, 2012b). Time spend on FB is negatively related to time spent preparing for class (Junco, 2012b). Sharing links and checking up on friends on FB showed to be positively related to GPA, in contrast to status updates which was found negatively related to GPA (Junco, 2012b). Moreover, the use of FB chatting was negatively related to time spent preparing for class (Junco, 2012b). To sum up, using FB for collecting and sharing information offer positive results on students since using the platform for socializing (status updates and chatting, Junco, 2012b).

Junco (2013) examines the frequency of FB use, comparing the time the users reported spending on FB with the time that they really spent. To this end, the participants installed on their computer an application which tracked the time that they really spent on FB (Junco, 2014b). After completing the investigation, the results showed that a high correlation exist between the time that users declared spending on FB and the time that they really spent (Junco, 2013). However, a remarkable difference between these two variables emerged, since the students spend fewer time on FB than the time they reported. The relationship between student engagement and FB use has been also investigated. Student engagement is defined by Astin (1984, p. 518) as "the amount of physical and psychological energy that the student devotes to the academic experience". In a prominent study, Junco (2012a) addressed to a large sample (N = 2368) of students and examined the relationship between frequency of FB use (FBtime and FBcheck) and frequency of participating in FB activities with student engagement, time spent preparing for class and time spent in co-curricular activities.

Frequency of FB use was negatively correlated to engagement scale score. In addition, some of the FB activities such as playing games and checking up on friends were negatively correlated to engagement scale score and some others such as commenting, creating or RSVP (replay please) to events positively related (Junco, 2012a). Furthermore, there was no relationship between the frequency of FB use and time spent preparing for class. On the contrary, a significant negative relationship between FB chat and time spent preparing for class emerged (Junco, 2012a). Moreover, FB time was positively related to time spent participating in co-curricular activities in contrast to FB check which was not related. Some activities (commenting, creating or RSVP to events, viewing photos) had a positive relationship with time spent in co-curricular activities and some others (playing games, checking up on friends, posting photos) negative (Junco, 2012a). To further explore these claims, Junco (2014a) examined a variety of social network activity and its relation to specific facets of students' academic involvements. In specific, he presents studies in which he investigated extensively the relationships between: FB and student engagement, FB and social and academic integration of the student, FB and academic performance, twitter and student engagement, twitter and social and academic integration of the student, twitter and academic performance (Junco, 2014a).

Heiberger & Harper (2008) also examined the relationship between FB use and student engagement. They concluded that FB can be used to increase student engagement and also support first year university students in their transition from school reality to academic life. Yu, Tian, Vogel, and Kwok (2010) examined if the student engagement on FB is positively related to the growth of self-esteem, their satisfaction with university life and the pursuance of tasks in a proficiency level. In all three research questions, a positive correlation was established.

Lastly, Kirschner and Karpinski (2010) examined the relationship between FB use and their self-reported academic performance (college grade point average and the weekly hours spent on studying). The results show that FB users declare to have lower college grade point average and spend fewer hours on studying in comparison to the students who did not use FB (Kirschner & Karpinski, 2010).

OBJECTIVE OF THE STUDY/HYPOTHESES

Understanding of social media behavior is critical to a way forward in computing education. To this end, it would be useful to deeper understand how technology/FB use affects educational outcomes.

However, from the studies presented previously, it emerges that the research related to the effect of FB use on student performance, is still at its infancy. Therefore, more studies which examine FB use, students' characteristics and their performance are required. This goal constitutes the core of the rationale of the study.

This paper attempts to extend the framework proposed by Junco (2012a) to examine relation between specific types of FB use and academic performance. To further explore the issue, the students' personality characteristics using the Big Five Personality Test (Goldberg, 1999) and their relation to specific measures of academic activity (Kakaraki, Tselios & Katsanos, 2017) was also examined.

Thus, the study presented in paper examines the relationship between the students' use of social media and personality with their performance and their integration in academic society. In specific, the aim of this study is to examine the relationship of Facebook (FB) use and personality characteristics of the students, using the Big Five Personality Test (Goldberg, 1999) with (a) student engagement, (b) time spent preparing for class, (c) time spent in co-curricular activities and (d) academic performance. In specific, the research questions examined were:

Question 1a (and 1b): Is there a relationship between frequency of Facebook use (and Facebook activities) and student engagement?
Question 2a (and 2b): Is there a relationship between frequency of Facebook use (and Facebook activities) and time spent preparing for class?
Question 3a (and 3b): Is there a relationship between frequency of Facebook use (and Facebook activities) and time spent in co-curricular activities?
Question 4a (and 4b): Is there a relationship between frequency of Facebook use (and Facebook activities) and academic performance?
Question 5: Is there a relationship between Big Five characteristics and student engagement?
Question 6: Is there a relationship between Big Five characteristics and time spent preparing for class?
Question 7: Is there a relationship between Big Five characteristics and time spent in co-curricular activities?
Question 8: Is there a relationship between Big Five characteristics and academic performance?

As mentioned previously, the framework of this study is based on Junco's (2012a) pioneering research. Therefore, the first three research questions are identical and formulated to examine their validity in a different educational environment. The next five research questions constitute an extension of the beforementioned research, while investigating at the same time the relationship between frequency of FB use and academic performance and students' personality characteristics respectively.

The rest of the paper is organized as follows: Firstly, the research method is presented, followed by the presentation and analysis of the results obtained. Subsequently, the obtained results are discussed and compared to the results reported by Junco (2012a). The practical implications of the study are also discussed.

METHODOLOGY

Research Method

The present study constitutes a case study and is categorized to the mixed research example (Cohen, Manion, & Morrison, 2013). In a case study, the researcher pay attention on the characteristics of an individual unit. The goal of this observation is to examine deeply and analyze further these characteristics which constitute the life circle of a unit with the aim of establishing conclusions for the wider environment, in which the unit belongs (Cohen, Manion, & Morrison, 2013, Hoinville & Jowell, 1978). A questionnaire to identify students' demographic data, student engagement, academic performance, FB use and personality was designed.

Participants

The sample comprises students of the Department of Educational Sciences and Early Childhood Education of University of Patras, who attended the laboratory section of three modules (Information and Communication Technology in Education, Introduction to Web Science, Design and Evaluation of Educational Software). Overall, 204 students participated in the study, 198 women, 6 men, aged 18-36 (mean = 20.63, SD = 2.23).

Instruments and Measures

This study used a questionnaire in which students were asked to report demographic data (gender, age, year of study, high school grade point average, high school direction) and data related their academic performance (university grade point average, number of modules which haven't been completed successfully).

As far as the questions about student engagement (Astin, 1984) are concerned, the first 21 questions were taken from Junco's (2012a) study. Questions 1-19 are obtained from the National Survey of Student Engagement (NSSE, Junco 2012a). In specific, questions 1-14 were coded by using a four-point, positively anchored Likert scale, ranging from "Never" to "Very often." For these analyses, "Never" was coded as 1, "Sometimes" as 2, "Often" as 3, and "Very often" as 4. Questions 15–17 were presented as a seven-point, positively anchored Likert scale and were coded with responses 1 or 2 as "1," responses 3 or 4 as "2," responses 5 or 6 as "3," and response 7 as "4". Responses for question 18 were coded 1 for "Very little," 2 for "Some," 3 for "Quite a bit," and 4 for "Very much". Finally, responses for question 19 were coded 1 for "Poor," 2 for "Fair," 3 for "Good," and 4 for "Excellent".

The final score for the 19-item NSSE instrument is an aggregate engagement score (sum of the individual items). In the last two questions, which are related to student engagement, the students were asked to estimate the average amount of time they spent preparing for class (academic engagement) and engaging in co-curricular activities (co-curricular engagement) each week. Answers to these questions were converted to minutes for these analyses (Junco, 2012a, p. 164).

In addition, students were asked to estimate their *FB use*. Specifically, students were asked to estimate their time spent on FB (FB time) as well as how often they checked FB (FB check). They were asked to evaluate average time spent daily and time spent "yesterday," as well as the average number of times they checked FB daily and "yesterday". For FB time, students used a pull-down menu to select the hours and minutes spent using FB and for FB check students were allowed to input an open-ended number. The hours and minutes spent using Facebook were converted to minutes for these analyses.

Students were also asked to estimate the frequency with which they conducted various activities on FB. These 14-items are also taken from (Junco, 2012a) and there are presented in Figure 1. Students were asked how frequently they perform the FB activities when they are on FB. Fb activity items were coded using a five-point, positively anchored Likert scale ranging from "Never" to "Very Frequently (close to 100% of the time)." For these analyses, "Never" was coded as 1, "Rarely (25%)" as 2, "Sometimes (50%)" as 3, "Somewhat frequently (75%)" as 4 and "Very frequently (close to 100% of the time)" as 5.

In the last part of the questionnaire, there are 50 questions of the Big Five Personality Test (Goldberg, 1999). The 50 questions are evenly distributed to 5 personality characteristics, which are the followings: extraversion (sociable), agreeableness (co-operative), conscientiousness (liable), emotional stability (calm) and openness to experience (open-minded). These factors are well-known as Big Five (Goldberg, 1999). This title was not given as a reflection of its inherent glory but to emphasize on the fact that each one of these factors is extremely wide. Therefore, the structure of Big Five is not implying that the differences in personality can be reduced in only five characteristics. On the contrary, these five dimensions depict the personality in a wider level of distraction and

each dimension summarize one big number of more specific characteristics of personality (John & Srivastava, 1999). In this study, the Greek version of Big Five was adopted. The questionnaire was created on Google Forms and for the data analysis was used SPSS v20.

Reliability Analysis

Regarding engagement instrument and big five personality test reliability, the Cronbach's alpha estimate for the engagement instrument of NSSE was 0.75 and for the big five personality test was 0.79, which are both considered acceptable. Regarding the engagement instrument validity, for the 19-item engagement scale the total score on the scale was correlated to the number of minutes which students reported spending in co-curricular activities in a typical week (Junco, 2012a). Also, a weak but significant correlation between scores on the engagement instrument and average minutes per week which students reported spending in co-curricular activities (Pearson's $r = 0.26$, $p < 0.01$), which is in line to Junco (2012a) findings. Also, the big five personality test validity is being tested and is proved by Goldberg (1999).

Procedure

The study took place from 24/03/2016 to 27/05/2016. The participation in this study was voluntary and there was not an incentive for their participation. The announcement of the questionnaire took place in the courses' laboratory sessions which were mentioned above and in the official Facebook group of the department. The students had to spent approximately 15-20 minutes to complete the questionnaire.

RESULTS

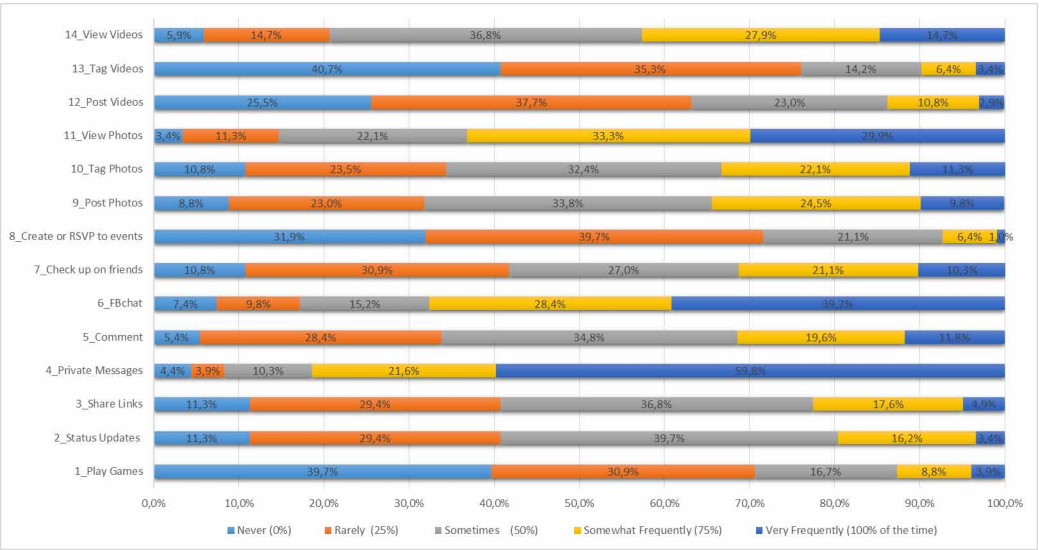
For all research questions, descriptive statistics, appropriate correlations' analysis, statistical significance testing and hierarchical regression took place. Hierarchical regression has been carried out by using five groups of variables: in the first group is included "gender" and "years of study", in the second the variable "FB time", in the third "FB check", in the fourth "the frequency with which they conducted various activities on FB" and in the fifth "the characteristics of big five personality test".

Moreover, the independent variable "FB use" comprised two variables: FB time and FB check. Since FB time and FB time "yesterday" were highly and significantly correlated (Pearson's $r = 0.73$, $p = 0.00$), only FB time was used in the analyses. Furthermore, since FB check and FB check "yesterday" were also highly and significantly correlated (r Pearson $= 0.95$, $p = 0.00$), only FB check was used in the analyses. Also, the independent variable "academic performance" consist of two other variables: university grade point average and number of modules which haven't been completed successfully. The results obtained for each research questions are presented in the following.

As reported previously, most participants (198/204) were females. For the variable "high school direction", 171 (83.8%) were from theoretical direction, 8 (3.9%) from scientific direction and 25 (12.3%) from technological direction. 52 (25.5%) students were at their first year of study, 54 (26.5%) students were at the second year of study, 33 (16.2%) students were at the third year of study, 61 (29.9%) students were at the fourth year of study and the last 4 (2%) students were at their fifth or higher year. Attention was given to include a satisfactory number of participants from each year. The frequency of the 14 FB activities reported by the students is presented in Figure 1.

The aggregated descriptive statistics for the most significant variables of the study are presented in Table 1.

Figure 1. Frequency of use for the 14 measured FB activities



Research Questions

Question 1a (and 1b): Relationship Between Frequency of Facebook Use (and Facebook Activities) and Student Engagement

The relationship between FB time and student engagement was weak and significant ($r = 0.20$, $p = 0.00$). However, the relationship between FB check and student engagement was not significant. Also, only the relationship between sharing links and student engagement was weak and significant ($r = 0.21$, $F = 3.17$, $p = 0.01$).

Hierarchical regression unveiled a significant positive relationship between FB time and student engagement, although there was no relationship between FB check and student engagement. Frequency of sharing links was a positive predictor of student engagement while sending private messages was a negative one.

Question 2a (and 2b): Relationship Between Frequency of Facebook Use (and Facebook Activities) and Time Spent Preparing for Class

The relationship between FB time and time spent preparing for class was weak and significant ($r = 0.14$, $p = 0.04$) but the relationship between FB check and time spent preparing for class was not significant. Moreover, only the relationship between playing games and time spent preparing for class was weak and significant ($r = 0.15$, $F = 3.25$, $p = 0.01$).

Hierarchical regression demonstrated a significant positive relationship between FB time and time spent preparing for class, although there was no relationship between FB check and time spent preparing for class. Frequency of playing games was positively predictive of time spent preparing for class while status updating was negatively predictive.

Question 3a (and 3b): Relationship Between Frequency of Facebook Use (and Facebook Activities) and Time Spent in Co-Curricular Activities

There was no relationship between frequency of FB use and time spent in co-curricular activities. Also, the relationships between sending private messages and time spent in co-curricular activities ($r=-0.12$, $F=2.73$, $p=0.03$) and between viewing videos and time spent in co-curricular activities ($r=-0.27$, $F=4.85$, $p=0.00$) are weak and significant.

Table 1. Descriptive statistics

	Sample		1st Year		2nd Year		3rd Year		4th Year	
	Mean	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**
Age	20.63	2.23	19.10	1.59	20.02	2.32	20.97	1.45	21.95	1.59
High school grade point average	17.18	1.20	17.10	1.38	17.14	1.10	17.45	1.02	17.15	1.12
University grade point average	7,08	1,01	6,94	1,71	6,97	0,73	7,44	0,69	7,11	0,46
Number of modules which haven't been passed	3.14	4.15	1.04	1.95	3.24	3.21	2.52	2.36	4.90	5.76
Student Engagement	44.17	7.39	44.75	7.67	44.24	8.15	45.73	6.68	42.84	6.91
Time spent preparing for class (min)	276.24	239.47	220.33	248.64	310.48	205.71	260.24	242.42	282.33	229.39
Time spent in co-curricular activities (min)	127.02	179.76	110.08	166.88	87.89	144.10	144.15	148.83	165.26	218.20
Fb time (min)	255.25	233.39	378.38	319.34	222.50	202.20	223.94	184.88	198.52	154.60
Fb time yesterday (min)	192.18	219.65	300.73	310.92	164.44	145.02	212.88	263.36	119.13	89.24
Fb check	10.67	17.27	14.77	17.05	11.43	26.86	8.55	7.17	7.51	8.13
Fb check yesterday	8.81	16.47	13.04	15.32	9.81	26.76	6.52	5.85	5.69	5.98
1_Play Games	1.06	1.13	1.06	1.13	1.04	.99	1.03	.88	1.10	1.35
2_Status Updates	1.71	.98	2.00	1.12	1.76	.93	1.67	.85	1.51	.92
3_ Share Links	1.75	1.03	1.94	1.26	1.81	.99	1.70	.88	1.59	.92
4_ Private Messages	3.28	1.09	3.50	.87	3.02	1.32	3.33	.92	3.30	1.09
5_ Comment	2.04	1.08	2.60	1.14	1.70	1.00	2.00	.94	1.89	.97
6_Fb chat	2.82	1.25	3.04	1.24	2.76	1.18	2.76	1.06	2.72	1.39
7_ Check up on friends	1.89	1.17	2.33	1.23	1.83	1.02	2.03	1.07	1.51	1.16
8_ Create or RSVP to events	1.05	.94	1.15	1.02	1.20	.94	.91	.84	.93	.91
9_ Post Photos	2.03	1.11	2.42	1.14	2.00	1.12	1.94	1.09	1.79	1.03
10_ Tag Photos	2.00	1.16	2.27	1.21	1.96	1.10	1.91	1.18	1.85	1.15
11_ View Photos	2.75	1.11	3.17	.92	2.69	1.08	2.94	1.00	2.38	1.20
12_ Post Videos	1.28	1.05	1.62	1.17	1.17	.88	1.48	1.18	1.00	.95
13_ Tag Videos	.97	1.06	1.48	1.31	.74	.81	1.00	1.09	.70	.86
14_ View Videos	2.31	1.08	2.67	1.22	2.20	.92	2.27	.91	2.10	1.08
Extraversion	32.87	6.76	34.69	6.99	33.11	5.67	33.15	5.88	30.77	7.37
Agreeableness	42.90	4.95	41.87	6.71	42.46	4.29	44.67	3.36	43.11	4.30
Conscientiousness	35.46	6.97	35.23	6.39	35.57	7.20	37.06	7.57	34.36	6.93
Emotional Stability	27.73	6.81	26.10	6.61	28.24	7.07	27.33	5.80	28.34	6.76
Openness to Experience	35.60	5.53	35.63	6.05	35.17	5.45	36.52	5.14	35.21	5.47
Total Score of Big Five	174.56	17.46	173.52	17.83	174.56	18.73	178.73	14.51	171.80	16.16

Hierarchical regression unveiled no relationship between frequency of FB use and time spent in co-curricular activities. Frequency of viewing videos was negatively predictive of time spent in co-curricular activities.

Question 4a (and 4b): Relationship Between Frequency of Facebook Use (and Facebook Activities) and Academic Performance

The relationship between FB time and academic performance (for both university grade point average and number of modules which haven't been completed successfully) as the relationship between FB check and academic performance (for both university grade point average and number of modules which haven't been completed successfully) was not significant. Also, only the relationship of status updates and university grade point average ($r = -0.14$, $F = 4.65$, $p = 0.00$) is weak and significant. The relationships of playing games ($r = 0.14$, $p = 0.04$), commenting ($r = -0.18$, $p = 0.00$), viewing photos ($r = -0.20$, $p = 0.00$) and posting videos ($r = -0.14$, $p = 0.04$) with number of modules that haven't been completed successfully by the students were all weak and significant.

By using hierarchical regression, there was no relationship between frequency of FB use and university GPA. Frequency of commenting was positively predictive of university GPA while frequency of engaging in FB chat and status updating were negative predictors. Furthermore, there was no relationship between frequency of FB use and number of modules which haven't been completed successfully. Frequency of posting photos and playing games found to be a positive predictor of number of modules which haven't been completed successfully.

Question 5: Relationship Between Big Five Characteristics and Student Engagement

The relationship between extraversion ($r = 0.34$, $p = 0.00$), agreeableness ($r = 0.15$, $p = 0.02$), conscientiousness ($r = 0.23$, $p = 0.00$), openness to experience ($r = 0.33$, $p = 0.00$), total score of Big Five ($r = 0.39$, $p = 0.00$) and student engagement were weak or medium and significant. The relationship between emotional stability and student engagement was not found significant.

Hierarchical regression, unveiled a significant positive relationship between extraversion, conscientiousness, openness to experience and student engagement.

Question 6: Relationship Between Big Five Characteristics and Time Spent Preparing for Class

The relationship between Big Five characteristics (for each one of them and total score) and time spent preparing for class was not significant. By using hierarchical regression, there was a significant positive relationship between extraversion and time spent preparing for class.

Question 7: Relationship Between Big Five Characteristics and Time Spent in Co-Curricular Activities

Only the relationship between agreeableness and time spent in co-curricular activities ($r=-0.19$, $p=0.00$) was found weak and significant. By using hierarchical regression, there was a significant positive relationship between extraversion and time spent in co-curricular activities.

Question 8: Relationship Between Big Five Characteristics and Academic Performance

Only the relationships between openness to experience and university grade point average ($r = 0.25$, $p = 0.00$), total score of Big Five and GPA ($r = 0.17$, $p = 0.02$) were found to be significant. Moreover, the relationships of conscientiousness ($r = -0.30$, $p = 0.00$), total score of Big Five ($r = -0.13$, $p = 0.05$) with number of modules which haven't been completed successfully were found to be weak and significant.

Hierarchical regression unveiled a significant positive relationship between openness to experience and university grade point average while there was a significant negative relationship between conscientiousness and number of modules which haven't been completed successfully. The groups of variables that had a significant contribution to student engagement were the characteristics of big five personality test (22%) and FB time (3%). Also, FB time (3%) has a significant contribution on time spent preparing for class.

The frequency with which they conducted activities on FB shows a significant contribution on time spent in co-curricular activities (15%). Moreover, the group of variables that shows a significant contribution on university GPA was the frequency with which they conducted various activities on FB (16%) and the characteristics of big five personality test (8%). Finally, the characteristics of big five personality test (9%) shows a significant contribution on the number of modules which haven't been completed successfully.

DISCUSSION

The results of the current study in contrast with the results reported by Junco (2012a) are presented in Table 2. According to the data obtained sending personal messages, chatting on FB and viewing photos were the most popular activities for all participants. On the contrary, in Junco (2012a, p. 166) the most popular activities were viewing photos, commenting and checking up on friends.

In this study, a positive relationship between FBtime and student engagement was found, although in Junco (2012a) a negative one was found (Table 2). Heiberger and Harper (2008) also found a positive relationship between FBtime and student engagement. The different results may be attributed to different uses of Facebook. Also, the relationship between fbcheck and student engagement was not significant but, in the study conducted by Junco (2012a), it was found to be negative. Furthermore, in the present study sharing links was positively related to student engagement and sending private messages was negatively related. In Junco (2012a), commenting and creating or RSVP to events was positively related to student engagement. Playing games and checking up on friends were negatively related to student engagement.

Fb time (mean = 255,25, SD = 233,39) and fbtime yesterday (mean = 192,18, SD = 219,65) but also FB check (mean = 10,67, SD = 17,27) and FB check yesterday (mean = 8,81, SD = 16,47) seem to be different in relation with the results reported by Junco (2012a, p. 166) for the same variables. This difference is possibly due to the different participants' characteristics of each study as well as the evolution of the Facebook itself and its use during the years.

Moreover, in the present study, a positive relationship between FB time and time spent preparing for class was found, although in Junco (2012a) was not found significant. Both in this study and in Junco (2012a) the relationship between FB check and time spent preparing for class was not found significant. Also, in this study, playing games was positive related to time spent preparing for class and status updating was negatively related. In Junco (2012a), the only significant FB activity was FB chatting which was negatively related to time spent preparing for class.

A comparison of the current study and the results reported by Junco (2012a) as far as the relationship between FB time and time spent in co-curricular activities is concerned, unveiled significant differences. The only thing that they have in common was the relationship between FB check and time spent preparing for class and the relationship between FB check and time spent in co-curricular activities, which both were not found significant. In this study, FB time and time spent in co-curricular activities was not found significant, although in Junco (2012a) the same relationship was found positive. The relationship between FB check and time spent in co-curricular activities was not demonstrated significant, both in this study and in the study conducted by Junco (2012a). Lastly, in Junco (2012a), commenting, creating or RSVP to events and viewing photos were positively related to time spent in co-curricular activities and playing games, checking up on friends and posting photos were negatively related. In the present study, the only significant FB activity was the frequency of viewing videos which was negatively related to time spent in co-curricular activities.

As far as the remaining research questions are concerned, for the fourth research question, there was no relationship between FB use and academic performance. Commenting had a positive relationship with university GPA. However, number of status updates and chatting on FB had a negative relationship. Furthermore, playing games and posting photos had a positive relationship

Table 2. Comparison of the results reported in this study and the study conducted by Junco (2012a). (ns= no significant)

	Student Engagement		Time Spent Preparing for Class		Time Spent in Co-Curricular Activities	
	Current Study	**Junco (2012a)**	**Current Study**	**Junco (2012a)**	**Current Study**	**Junco (2012a)**
Fbtime	positive	negative	positive	ns	ns	positive
Fbcheck	ns	negative	ns	ns	ns	ns
Frequency of Facebook activities	Sharing links (positive) Sending private messages (negative)	Commenting & Creating or RSVP to events (positive) Playing games & Checking up on friends (negative)	Playing games (positive) Status Updating (negative)	Fb chatting (negative)	Viewing videos (negative)	Commenting, Creating or RSVP to events & Viewing photos (positive) Playing games, Checking up on friends & Posting photos (negative)

with the number of modules which haven't been completed successfully by the students, although commenting, viewing photos and posting videos had a negative relationship.

For the fifth research question, extraversion, agreeableness, conscientiousness, openness to experience and total score of Big Five were positively correlated with student engagement. For the sixth research question, only extraversion had a positive relationship with time spent preparing for class. For the seventh research question, extraversion had a positive relationship with time spent in co-curricular activities, although agreeableness had a negative relationship. Lastly, for the eighth research question, openness to experience and total score of Big Five present a positive relationship with university GPA, even though conscientiousness and total score of Big Five present a negative relationship with the number of modules which haven't been completed successfully.

CONCLUSION

The study reported in this paper examines the relationship between the students' social media use their personality and their performance as well as the integration of the students in academic society. In concordance with the finding reported by Junco (2012a,b) it was found that efforts to draw conclusions on the relationship between *general* Facebook use and academic performance are somewhat superficial, without an attempt to identify, and measure, specific types of use.

The implications of this study are important for all stakeholders, both instructors and the students. Firstly, instructors can use a FB group or a FB page as a place in which their students can express themselves on things that are related to a subject, make a debate or a discussion on a theme, exchange ideas and queries. The results illustrate that the time spent on FB is positively related to student engagement and to time spent preparing for class, and specifically sharing links presents a positive relationship with student engagement and playing games on FB presents a positive relationship with time spent preparing for class. Thus, instructors should design appropriate interventions and encourage their students spend more time on FB group or page by sharing links or playing educational games, which are related to the theme of the module.

Moreover, commenting showed a positive relationship with university GPA and viewing photos and posting videos had a negative relationship with the number of modules which haven't been completed successfully by the students. To have a better GPA and fewer number of modules which

haven't been completed successfully, instructors could encourage their student to comment on topics, view more photos and post more videos on FB which are related to a module. Finally, specific students' characteristics extraversion (positive related to student engagement, to time spent preparing for class and to time spent in co-curricular activities), openness to experience (presents a positive relationship with university GPA) and conscientiousness (presents a negative relationship with the number of modules which haven't been successfully completed) could be exploited and cultivated to acquire better educational results. Finally, students could achieve better educational results if their instructor use FB as a part of the module because it is a well-known environment for them and an appropriate tool for education (Junco, 2014a).

The study is not without limitations. Firstly, that it is correlational by nature. Thus, no causal relations could be established. Secondly, the sample cannot be considered as representative. Thirdly, the use of students' self-report measures constitutes a validity threat to the data obtained. More studies in different educational settings and institutions and with more representative samples should be carried out. In addition, the investigation of learners' behavioral intention to use structured educational activities mediated by social networks using technology acceptance models constitutes an additional research goal (Tselios, Daskalakis, & Papadopoulou, 2011, Altanopoulou & Tselios, 2017). Moreover, deeper investigation of the interaction between students' observed activity in other social networks and the learning outcome (Katsanos, Tselios & Avouris, 2010; Tselios & Avouris, 2003; Tselios, Avouris, & Kordaki, 2002) will be also examined.

Nowadays, education is undergoing a profound change. A deeper understanding of social media use is critical to a way forward in computing education. From the results of the current study, it derives that Facebook can have positive effects on student engagement which could increase students' learning performance. Finally, the instructors by taking into consideration the students' personality characteristics could adjust appropriately the designed didactic interventions which is expected to lead to an increased students' engagement.

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