

A Model for Understanding Educational Facebook Use

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Received 22 September 2014; accepted 22 April 2015

There are numerous types and variations of social networking web sites, such as MySpace, FB, Hi5, and Cyworld. Of these networks, the most commonly used is FB. Because of the widespread use of FB by youth, its effects on student achievement has recently become one of the most important issues that are curious for families. Therefore, it has become necessary to study the use of social networking sites for educational purposes and their related variables. In the present study, the variables that affect the educational use of FB and the relationships among these variables are examined and presented through a model. In the current study, data are collected from undergraduate students in the College of Education at an Anatolian university in Turkey. The participants consist of 1,066 undergraduates—65% are female (n = 691) and 35% male (n = 375). The result shows that knowledge of these variables enables us to largely understand the educational use of FB by individuals. In conclusion, it was seen that students who use FB for educational purposes more have higher GPAs. These students use FB more frequently but they spend less time on it. Also, they have fewer FB friends than students who have low GPAs.

Keywords: Adult learning; media in education; interactive learning environments.

INTRODUCTION

During the 21st century, technological advances continue to change the way we learn, teach, communicate, and socialize (Koc & Ferneding, 2013; Kocak & Gulcu, 2013; Yigit, 2014). One such change is the prominence social networking web sites presently enjoy, particularly among youth (Cain, 2008). Youth are taking advantage of the opportunities offered by social networks to easily reach the information they want, to contact their friends or make new friends, and to

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doi: 10.12973/eurasia.2015.1447a

cases, associations and roles) forming a social bond with one or more interconnected social relationships (Marshall, 1999). When the technology aspect is considered, social network sites can be defined as online platforms that allow people to present themselves, modify their social networks, and create or maintain connections with others (Ellison, Steinfeld, & Lampe, 2006). For instance, social networks allow users to join

or create their own groups so they can communicate with others who have similar backgrounds or interests

(Kwon & Wen, 2010).

present a variety of ideas by establishing new groups. A social or public network means individuals (in rare

In addition, social networks can also be used for educational purposes (Ajjan & Harsthone 2008; Bosch, 2009; Ractham & Firpo 2011; Yuen & Yuen, 2008). Social networks can be used to supplement classroom instruction so students can participate in an interactive,

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State of the literature

- Social networks can be used to supplement classroom instruction so students can participate in an interactive, collaborative learning experience using a familiar media (Ajan & Hartshome, 2008).
- People generally use FB to maintain their social connections, to follow issues related to their jobs, and/or to organize their daily activities (Mazman, 2009).
- Among the numerous types and variations of social networking web sites, such as MySpace, FB, Hi5, and Cyworld, the most commonly used is FB.

Contribution of this paper to the literature

- In the present study, the variables that affect the educational use of FB and the relationships among these variables are examined and presented through a model.
- The students who use FB for educational purposes more have higher GPAs and those students use FB more frequently but they spend less time on it.
- The students have fewer FB friends than students who have low GPAs.

(Ajan & Hartshome, 2008). If the opportunities provided by social networks to college students are examined, social networks can be used in an inexpensive, easy manner and can be integrated easily into educational processes. Also, students graduating from the university may have the opportunity to reach previous learning experiences and outcomes again (Gülbahar, Kalelioğlu, & Madran, 2010).

Facebook (FB)

There are numerous types and variations of social networking web sites, such as MySpace, FB, Hi5, and Cyworld. Of these networks, the most commonly used is FB. As shown in Table 1, the number of FB users is rapidly growing (Socialbakers, 2012).

As seen in Table 1, the top seven countries in the world, which have the most number of FB members, are the United States, India, Indonesia, Brazil, Mexico, Turkey, and United Kingdom. For the last six months, Brazil (51%), India (23%), and Mexico (14%) have the highest increased number of FB members. In addition, the United States, United Kingdom, and Turkey have the highest use of FB in their populations. These statistics show FB and its features are adopted by many people around the world and usage continues to increase.

To better understand why FB is popular, it is useful to explore its characteristics. In fact, FB has many features, including a simple template, so individuals can build personal web pages named as "FB Profiles" that usually consist of a host of personal information (Kolek & Saunders, 2008). It has a search engine option, so people can search for others and view their photo albums in their own networks. Individuals can share interests and personal details, list work and education history, publish photos and notes, and, in general, communicate with others by posting on "the wall." The news feed section shows all actions, such as profile changes, and wall posts of other users who have been added as "friends." The "tagging" option allows people to name others in photos and to show these photos on the profiles of the "tagged" individuals. Using its optional privacy features, users can restrict access to parts of their profile. The newly launched application "Timeline" allows people to tell their own life story through photos, friendships, and personal milestones, like graduating or traveling to new places (Facebook, 2012).

People generally use FB to maintain their social connections, to follow issues related to their jobs, and/or to organize their daily activities (Mazman, 2009). The most common use of FB is for social purposes, as determined by various studies conducted on this component of FB use (Clare, Julia, Jane & Tristram, 2009; Ellison, et al., 2007; Valenzuela, 2009). To maintain their social connections, people contact existing friends on FB, try to find old friends, and communicate with their families, relatives, friends from school and work in different methods. They join several activities concerning daily life, share ideas, materials, and resources on FB to keep current with issues related to their jobs. Often time, people follow current developments to maintain their daily activities and spend time playing games and having fun on FB.

Because of the widespread use of FB by youth, its effects on student achievement has recently become one of the most important issues that are curious for families. Hence, the effects of FB use on success and GPA have become the subject of much research. When these studies are examined, different findings are reported. In the literature, it is found students' GPA scores are lower than those for students who do not use FB (Karpinski & Duberstein, 2009; Kirschner & Karpinski, 2010). In some studies, there is no significant difference between academic achievements for students who use and do not use FB (Kolek & Saunders 2008; Pasek, More, & Hargittai, 2009). Related literature shows more studies are needed to determine the impact of FB use on GPA and success.

Table 1. List of Countries on FB

Range	Country	Users	Change	±%	Population penetration
1	United States	154,760,400	-986 380	-0.63%	49.89%
2	India	45,868,120	+9 446 400	+25.94%	3.91%
3	Brazil	44,184,160	+16 245 280	+58.15%	21.97%
4	Indonesia	43,514,840	+3 095 980	+7.66%	17.91%
5	Mexico	33,939,440	+4 586 100	+15.62%	30.18%
6	Turkey	31,315,860	+580 760	+1.89%	40.25%
7	United Kingdom	30,157,300	-180 140	-0.59%	48.37%

Variables Affecting FB Use

One of the important variables affecting individuals' FB use is the number of FB friends. The number of FB friends per person varies in the literature. When related studies are examined, the number of FB friends ranges from 100 to 350 (Lewis & West, 2009; Sheldon, 2008). In recent studies, the number of FB friends per capita is reported as follows: 217 (Acar, 2008), 297 (Christofides, Muise, & Desmarais, 2009), 201 (DeSchryver, Mishra, Koehleer, & Francis, 2009), 150-200 (Ellison, et al., 2007), 179 (Golder, Wilkinson, & Huberman, 2007), 100-200 (Lewis & West, 2009), 200-350 (Sheldon, 2008) and 200 (Walther, Van Der Heide, Kim, Westerman, & Tong, 2008). The results of these studies show the number of FB friends is increasing over years and its average is 185.

In the literature, another important variable affecting the use of FB has been the time spent on FB. In the related studies, it is found that students spend from 10 to 121.2 minutes on FB. In detail, the time spent on FB daily is as follows: 38.86 min (Christofides et al., 2009), 10-30 min (Ellison et al., 2007), 30 min (Lampe, Ellison, & Steinfield, 2006): 38.93 min (Muise et al., 2009), 30 min (Orr et al., 2009), 30 min (Pempek, Yermolayeva, & Calvert, 2009), 10-60 min (Ross et al., 2009), 30-60 min (Walther et al., 2008), 10-60 min (Stern & Taylor, 2007), 121.2 min (O'Brien, 2011) and 101.09 min (Junco, 2012). The findings from these studies show the average time spent on FB per day is 48.6 minutes.

In addition to the time spent on FB daily, the frequency of FB use is examined as a variable affecting its use in the relevant research. Using different time periods, researchers have studied the frequency of FB use. In a research study, the frequency of FB use by respondents is reported as follows: 0.7% once a week, 2.6% once a day, 7.8% two times a day, 12.4% three times a day, 19.6% four times a day, 13.7% five times a day, 35.3% six times a day, 6.6% more than six times a day, and 1.3% other (O'Brien, 2011). In another study, it is found that 0.9% of respondents use FB never, 1.8% monthly, 1.8% weekly, 21.8% daily, and 73.6% multiple times per day (Ophus & Abbitt, 2009). Also, it is stated

that 66% of the participants use FB either daily or multiple times daily, while the remaining 22.7% use their accounts weekly (Kirschner & Karpinski, 2010). In general, relevant studies show individuals use FB daily and frequently. Overall, the literature shows FB has become an integral part of their lives.

Studies conducted by taking into account the

FB Use for Educational Purposes

opportunities FB provides to its users (adding videos and pictures, adding links, sending and receiving notices) state FB can also be used in educational contexts. It is ascertained that particularly the participative structure of FB enables collaborative learning within groups and communities, improves critical thinking and communication skills, enhances of resources and materials, opportunities to conduct joint projects, develops a positive attitude towards the subject, improves writing skills, and creates a personalized learning environment by providing active participation (Ajjan & Harsthone, 2008; Bosch, 2009; Özmen, Aküzüm, Sünkür & Baysal, 2011; Ractham & Firpo, 2011; Yuen & Yuen, 2008). Previous studies show FB can be used for educational communication, collaboration, and sharing resources and materials (Mazman, 2009). FB has important functions to maintain educational communication for students, such as conducting classroom discussions, making and following announcements about school, and informing students about homework assignments or resources (Bosch, 2009; Yuen & Yuen, 2008). At the same time, FB provides educational collaboration opportunities to students through functions, such as joining academic groups related to their school, department, or class; sharing ideas for collaborative class homework assignments and projects; providing online meetings with different students; and creating a common product (Estus, 2010; Mazman, 2009; Özmen, et al., 2011). In addition, FB gives students and teachers the chance to share educational resources and materials such as educational animations, materials, e-portfolios, documents, homework assignments, suggestions on the

subjects and projects (Albion, 2008; Mazman, 2009; Ractham & Firpo, 2011).

Purpose of the Study

During the 21st century, social networks, particularly FB use, have become a part of everyday life. The common use of social networking sites has caused the question of their usability and the opportunities they provide in education. Therefore, it has become necessary to study the use of social networking sites for educational purposes and their related variables. However, there are a limited number of studies in the literature (Mazman & Usluel, 2010; Muñoz & Towner, 2009; Selwyn, 2009) on the educational use of social networking sites. For these studies, the variables that affect the educational use of social networking sites were mostly reported in a descriptive manner and independent from one another. Related literature shows the educational use and factors that directly and indirectly affect this use of the most commonly used networking site, FB, have not been comprehensively studied. In the present study, the variables that affect the educational use of FB and the relationships among these variables are examined and presented through a model.

METHODS

Participants

In the current study, data are collected from undergraduate students in the College of Education at an Anatolian university in Turkey. The participants consist of 1,066 undergraduates 65% are female (n = 691) and 35% male (n = 375). The average age for the participants is about 20 years.

Measurement of Variables

The purpose of FB use is measured by a scale originally developed by Mazman (2009). The purpose of FB use questionnaire includes 11 5-point Likert-type items with response choices ranging from "none" to "always." The scale includes the following three subscales: social relations (items 1, 2, 3, 4, 5, 6, and 8), work-related activities (items 7 and 9), and daily activities (items 10 and 11). In this study, the coefficients of internal consistency (Cronbach's alpha) of the subscales are 0.68 for the purposes about social relations, 0.81 for the work-related purposes and 0.87 for the purposes on daily activities. Higher scores indicate a higher perceived purpose of FB use.

The educational FB use is assessed by a scale (Mazman, 2009) used to measure participants' views of FB in relation to its educational usage. This scale includes 11 items. A 5-point Likert-type set of choices ranging from "strongly disagree" to "strongly agree" is used to measure college students' use of FB for educational purposes. This survey has the following three subscales: communication (items 1, 2, 3, 5, and 6), collaboration (items 7, 8, and 9), and resource and material sharing (items 10 and 11). The coefficients of internal consistency (Cronbach's alpha) of the subscales are 0.90 for communication, 0.85 for collaboration, and 0.85 for resource and material sharing. Higher scores in this scale indicate higher perceived use of FB for educational purposes.

Finally, four additional variables are measured in the present study to include in the structural equation model: GPA, frequency of FB usage, time spent on FB, and number of friends on FB. The GPA question has five options: below 2.00 (n = 43), 2.01-2.50 (n = 247), 2.51-3.00 (n = 416), 3.01-3.50 (n = 276), and above 3.51 (n = 84). The frequency of FB usage has four options: a few times a year (n = 117), a few times a month (n = 130), a few times a week (n = 380), and daily (n = 439). The time spent on FB has five options: about 15 min.

Table 2. Criterion References for Fit Indices of Structural Equation Model

Criterion References	Perfect Fit Indices	Acceptable Fit Indices	Indices of Educational FB Use Model
RMSEA	≤ 0.05	0.06-0.08	0.047
NFI	≥ 0.95	0.94-0.90	0.986
CFI	≥ 0.97	≥ 0.95	0.990
GFI	≥ 0.90	0.89-0.85	0.987
AGFI	≥ 0.90	0.89-0.85	0.967
TLI	≥ 0.95	0.94-0.90	0.979
(χ^2/sd)	≤ 3	≤ 4-5	3.348

(n=333), about half an hour (n=303), 1 hour (n=274), 1-3 hours (n=121), more than 3 hours (n=35).

DATA ANALYSIS

In the present study, structural equation modeling procedures are used to explore the relationships that exist among the variables. Structural equation modeling analysis is a statistical approach to test a theoretical model to reveal the causal relationships between the observed and latent variables (Shumacker & Lomax, 2004). For each endogenous (dependent) variable, an equation is estimated by exogenous (independent) or

other endogenous variables from another equation. Both the direct and indirect effects of independent variables on the dependent variables are estimated. The structural model is tested by examining the path coefficients—the standardized regression coefficients (betas). Statistical analyses are conducted using SPSS (Statistical Package for Social Sciences) 19.0 and AMOS (Analysis of Moment Structures) 19.0 software.

FINDINGS

The structural equation analysis is conducted to test the relationships among the number of friends on FB,

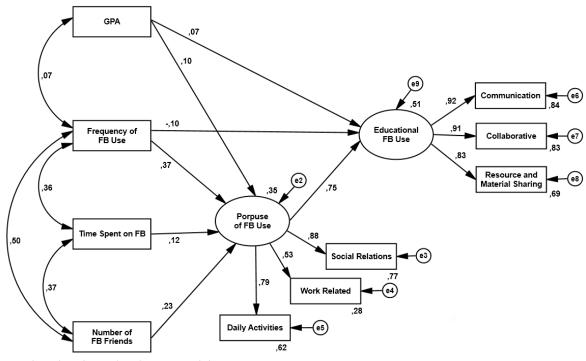


Figure 1. Educational Facebook Use Model

Table 3. Decomposition of total effect for the Educational FB Use Model

Predictor variable	Dependent variable	Total effect	Direct effect	Indirect effect	Standard error	Critical ratio (t)
GPA	Purpose of FB Use	0.103	0.103	0	0.144	3.674**
Frequency of FB Use	Purpose of FB Use	0.368	0.368	0	0.169	11.075**
Time in FB	Purpose of FB Use	0.117	0.117	0	0.134	3.898**
Number of Friend in FB	Purpose of FB Use	0.226	0.226	0	0.151	6.955**
GPA	Educational Use of FB	0.144	0.067	0.077	0.341	2.69*
Purpose of FB Use	Educational Use of FB	0.748	0.748	0	0.108	18.512**
Frequency of FB Use	Educational Use of FB	0.177	-0.098	0.275	0.429	-3.093*

^a Total effect = Direct effect + Indirect effect, **p <0.001, *p <0.01.

the frequency of FB use, the time spent on FB, GPA, the purpose of FB use, and the educational use of FB. The Educational FB Use Model includes four exogenous variables and two endogenous variables. Table 2 presents the perfect and acceptable fit indices for a structural equation model (Hu & Bentler, 1999; Jöreskog & Sörbom, 1984; Tanaka & Huba, 1985).

As depicted in Table 2, the Educational FB Use Model fits the data perfectly ($\chi^2 = 73.658$, sd = 22, p< 0.000; GFI = 0.987; AGFI = 0.967; CFI = 0.990; TLI = 0.979; NFI = 0.986; RMSEA = 0.047). The Educational FB Use Model is shown in Figure 1. In the structural equation model, only significant paths are included.

As seen from the model in Figure 1, the purpose of FB use has three subdimensions and these can be listed according to their effect sizes as follows: social use of FB (β =0.88, p<0.001), daily use of FB (β =0.788, p<0.001), and field-specific use of FB (β =0.532, p<0.001). It is clear the frequency of FB appears to be the most important independent variable that affects FB use for general purposes (β =0.368, p<0.001). The second most important independent variable affecting purpose of FB use is the number of FB friends $(\beta=0.226, p<0.001)$. Similarly, the time spent on FB $(\beta=0.117, p<0.001)$ and GPA $(\beta=0.103, p<0.001)$ are the other two variables that significantly affect usage of FB for general purposes. There is a positive linear relationship between purpose of FB use and frequency of FB, number of FB friends, time spent on FB, and GPA. These independent variables explain 35% of the variance in the use of FB for general purposes.

As shown in Figure 1, the variable of educational FB use has three subdimensions. The following are those subdimensions based on their effect sizes: use of FB for educational communication (β=0.92, p<0.001), use of FB for educational collaboration (β =0.91, p<0.001), and use of FB for educational resource and material sharing $(\beta=0.83, p<0.001)$. When the variables affecting educational FB use are analyzed, purpose of FB use is determined the most important independent and latent variable influencing educational FB use (β=0.75, p<0.001). Frequency of FB use (β =-0.10, p<0.01) and GPA (β =0.07, p<0.01) are the two other variables that affect educational use of FB. In addition to these direct effects, the model includes indirect effects. As provided in Table 3, the total effects are decomposed into direct and indirect effects.

As seen from Table 3, the number of friends in FB (β =0.169, p<0.001) and the time spent on FB (β =0.087, p<0.001) are the two independent variables that affect the educational use of FB indirectly. Also, the only negative relationship found between FB use is educational purposes and the frequency of FB use. All independent variables included in the model explain 51% of the variance in the educational FB use.

DISCUSSION

Studies of FB regarding its use, which has become widespread among young people and an important part of their lives, have gained importance in recent years. The relationship between FB use and academic achievement is the leading topic of research and interest. For this reason, there are various studies in the literature focusing on the relationship between FB use and achievement (Karpinski & Duberstein, 2009; Kirschner & Karpinski, 2010; Kolek & Saunders, 2008; Pasek et al., 2009). Some of these studies state social networking sites can be used for sharing resources and materials (Albion, 2008; Bosch, 2009; Estus, 2010; Mazman, 2009; Özmen, et al., 2011; Ractham, & Firpo, 2011; Selwyn, 2009; Yuen & Yuen, 2008). In only two studies (Kayri & Çakır, 2010; Mazman & Usluel, 2010), the educational use of FB is investigated in terms of the following variables: FB adoption, purpose of FB use, FB using frequency, years of Internet usage, surfing time in FB. However, we did not find any studies investigating the relationship between the use of FB for educational purposes and academic achievement (GPA) in the literature.

The model presented in this study shows GPA has direct and indirect effects on the educational use of FB. A positive relationship is shown between GPA and educational use of FB. This shows that as student achievement increases, educational use of FB also increases. In other words, more successful students use FΒ more for educational collaboration, communications, material sharing purposes. and Although Kolek and Saunders (2008) found no significant relationship between FB use and GPA, it is clear that extensive FB use may lead to a lower GPA (Boogart, 2006). The model in the present study shows a positive relationship between GPA and purposes of FB use. This positive relationship shows more successful students use FB in a more relevant way. For example, according to the model, more successful students use FB more for tasks related to their studies. These findings show that FB, which is one of the most commonly used social networking sites, can be used for educational purposes and this use could have a positive relationship on academic achievement.

In the model, a positive significant relationship is observed between GPA and the frequency of FB use, and a negative, although not significant, relationship is observed between GPA and time spent on FB and the number of friends on FB. These findings show more successful students use FB more frequently, spend less time on FB, and have fewer friends on FB. In the literature, time for FB use is negatively predictive of overall GPA. Furthermore, frequency of FB use for checking to see what friends are doing and sharing links is positively predictive of overall GPA (Junco, 2012).

When the studies in the literature are examined, it can be seen the number of FB friends per user usually increases daily. These numbers are stated as 150-200 (Ellison, et al., 2007), 179 (Golder et al., 2007), 217 (Acar, 2008), 246 (Walther et al., 2008), 200-350 (Sheldon, 2008), and 297 (Christofides et al., 2009). Parallel to the findings in the literature, the number of FB friends per student was found to be in the range between 201 and 300 also in the present study. The model presented in our study shows a positive relationship between the number of FB friends and purpose of FB use. This relationship indicates as the number of friends on FB increases, the purposes of FB use (daily, social and study-related use) also increases. Furthermore, the number of FB friends has an indirect effect on the educational use of FB.

In the present study, the participants were also asked about the number of school friends on FB. There is a positive and significant relationship between the number of participant students' school friends on FB and the educational use of FB (r = 0.197, p < 0.001). The findings regarding the number of FB friends and particularly the number of school friends on FB show an increase in the number of school friends on FB also causes an increase in educational use of FB by the students. It is perceived students add their school friends to their friend lists on FB mostly with the purpose of sharing information about school (materials, homework, announcements, collaboration, projects, etc.). For this reason, it can be said that as the number of school friends on FB increases, educational sharing will also increase and this will contribute to student

When the studies in the literature on FB are examined, it is seen the most significant variables that affect FB use are time spent on FB, number of friends on FB, and frequency of FB use (Acar, 2008; Christofides et al. 2009; Ellison, et al., 2007; Muise, et al., 2009; O'Brien, 2011). The model presented in our study reveals a positive relationship among time spent on FB, number of friends on FB, and frequency of FB use. In the literature, studies that investigate the relationships among these variables yielded different results. In their study, Moore and McElroy (2012) found a positive relationship between time spent on FB and number of FB friends; whereas, they found a negative relationship between time spent on FB and frequency of FB use, and between time spent on FB and number of FB friends. However, Junco (2012) found a positive relationship between time spent on FB and frequency of FB use.

In the model, the examination of the effects of time spent on FB, number of FB friends, and frequency of FB use on educational use of FB shows frequency of FB use has both direct and indirect effects on educational use of FB; whereas, time spent on FB and number of FB friends have an indirect effect on the use of FB for educational purposes through purposes of FB use. In their study, Kayri and Çakır (2010) found a positive, but insignificant, relationship between frequency of FB use and educational use of FB, but a significant, positive relationship between time spent on FB and educational use of FB. In the present study, we found a positive, significant relationship between frequency of FB use and educational use of FB, and a positive, but insignificant, relationship between time spent on FB and educational use. In brief, the findings of our research show that GPA and frequency of FB use have both a direct effect on educational use of FB and an indirect effect through purposes of FB use. However, time spent on FB and numbers of FB friends have an indirect effect on educational use of FB through purposes of FB use. In conclusion, considering the research found in the literature (Mazman & Usluel, 2010), educational use of FB can be increased if FB is used in a relevant way.

CONCLUSIONS

Studies conducted on FB in recent years show FB use has become prevalent and increasing day-by-day. The findings obtained in these studies show most of the students use FB every day (Kirschner & Karpinski, 2010; O'Brien, 2011; Ophus & Abbitt, 2009) and for a minimum of approximately one hour (Ross et al., 2009; Stern & Taylor, 2007; Walther et al., 2008). From these results, it can be understood that FB has become a part of the lives of the youth. Prevalent use of FB among young people has caused questioning of usability of FB and the opportunities it provides in education. This has made it necessary to study the use of FB for educational purposes and its related variables. However, there are a limited number of studies in the literature (Kayri & Çakır, 2010; Mazman & Usluel, 2010; Muñoz & Towner, 2009; Selwyn, 2009) on the educational use of social networking sites. As for these studies, the variables that affect the educational use of social networking sites were mostly reported in a descriptive manner and independent of one another. In the present study, the variables that affect the educational use of FB, and the relationships among these variables are examined and presented through a concrete model.

In this study, the analysis of certain variables revealed FB, one of the most commonly used social networking sites, can be used for educational purposes, too. According to the model presented in the study, it can be seen the variables of GPA, time spent on FB, the number of FB friends, and frequency of FB use are important predictors of purposes of FB use, and these variables have direct and indirect effects on educational use of FB. In the present study, these relationships are concretely presented and the educational use of FB is clarified. The findings of this study show GPA, time

spent on FB, number of FB friends, frequency of FB use, and purposes of FB use (daily, social, and study-related use) explain approximately half of the variance in the educational use of FB. This result shows that knowledge of these variables enables us to largely understand the educational use of FB by individuals. In conclusion, it was seen that more successful students use FB for educational purposes more by using FB more frequently but spending less time, having fewer FB friends, and using FB in a more relevant way.

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