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Students' perceptions of Facebook for academic purposes

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ABSTRACT

Facebook is the most popular Social Network Site (SNS) among college students. Despite the popularity and extensive use of Facebook by students, its use has not made significant inroads into classroom usage. In this study, we seek to examine why this is the case and whether it would be worthwhile for faculty to invest the time to integrate Facebook into their teaching. To this end, we decided to undertake a study with a sample of 214 undergraduate students at the University of Huelva (Spain). We applied the structural equation model specifically designed by Mazman and Usluel (2010) to identify the factors that may motivate these students to adopt and use social network tools, specifically Facebook, for educational purposes.

According to our results, Social Influence is the most important factor in predicting the adoption of Facebook; students are influenced to adopt it to establish or maintain contact with other people with whom they share interests. Regarding the purposes of Facebook usage, Social Relations is perceived as the most important factor among all of the purposes collected. Our findings also revealed that the educational use of Facebook is explained directly by its purposes of usage and indirectly by its adoption.

1. Introduction

Today's students can be described as digital natives or members of the Net Generation; they were born in the digital age and have been interacting with digital technology from an early age (Prensky, 2001, 2010; Tapscott & Williams, 2008, 2010; Thompson, 2013). If we, as professors, want to make strong connections with our students and engage them with the materials we want them to learn, we need to adapt our teaching strategies to their lifestyles. It is necessary to move from a traditional teacher-centered approach to learning, where the teacher imparts knowledge to students, to a learner-centered approach, where the student, instead of absorbing material transmitted by the instructor, learns how to learn (Hartman, Moskal, & Dziuban, 2005).

Part of this transformation has already taken place and Internet technologies have played a key role. According to Brown and Adler (2008), Internet has promoted a culture of content sharing that has been instrumental in the development of social learning. While the Web 1.0 vastly expanded access to information, the Web 2.0 provides new kinds of online resources (social network sites, blogs, wikis, folksonomies, virtual communities, …) that allow users with common interests to meet, share ideas, and collaborate (Brown & Adler, 2008; Maloney, 2007). Several studies show how social network tools can improve the learning experience by enabling interaction, collaboration, active participation, information & resource sharing, and critical thinking (Mason, 2006; Selwyn, 2009; Tapscott & Williams, 2010).

According to Boyd and Ellison (2007), social network sites (SNSs) can be defined as *"web-based services that allow individuals to (1) construct a public or semi-public profile within a bounded system, (2) articulate a list of other users with whom they share a connection, and (3) view and traverse their list of connections and those made by others within the system"*.

Currently, there are many different SNSs that support a wide range of interests and practices. Due to the increasing popularity of Facebook among the undergraduate student population (Cheung, Chiu, & Lee, 2011; Hargittai, 2007; Madge, Meek, Wellens, & Hooley, 2009; Selwyn, 2009), we decided to focus our study on this particular social networking tool.

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According to the Media Research Center (AIMC, March 2013), in February/March 2013, there were over 24.8 million internet users in Spain representing 63.1% of the population. The majority of these users (24.7%) are aged 35 to 44, which in other words is the age group that dominates the online sphere, followed by the age group 25–34 (24.1%).

Regarding social media, the study conducted by IAB & Elogia (2012) reports that Facebook is the most heavily adopted social networking site, with 85% of social media users. Tuenti (36%) and Twitter (32%) are far behind Facebook although Twitter has made impressive gains over the last year. Along these lines, the SocialBaker Report (2013) states that there were 17 million of Spanish users on Facebook. Internet users under 45 are particularly likely to use Facebook, and those aged 25–34 are the most likely of any demographic cohort to do so, followed by the age group 35–44. The distribution of Facebook users is fairly equal between male and female.

Although Facebook has been considered by students as a social technology rather than a formal teaching tool (Madge et al., 2009; Mazman & Usluel, 2009; Selwyn, 2009), it can have a significant impact on student's performance. Facebook can help students settle into university life, leading them to a higher level of self-esteem, social acceptance and adaptation to university culture, which can improve their learning outcomes (Madge et al., 2009; Wang & Wu, 2008; Yu, Tian, Vogel, & Kwok, 2010).

Despite Facebook's potential to enhance the learning process, several studies conclude that faculty members are reluctant to incorporate this technology into their teaching strategies (Ajjan & Hartshorne, 2008; Cloete, de Villiers, & Roodt, 2009; Roblyer, McDaniel, Webb, Herman, & Witty, 2010). Surprisingly, the ECAR Survey of Undergraduate Students & Information Technology (Smith & Caruso, 2010) along with other studies (Garcia & Qin, 2007; Jones & Shao, 2011; Lohnes & Kinzer, 2007; Schulmeister, 2008) show how students have persistently reported that, although they increasingly use technology in their personal lives, they feel comfortable with traditional learning models and prefer moderate use of ICT (Information and Communication Technologies) in their courses. However, Jones and Shao (2011) recommend being cautious about this finding because the interpretation of what "moderate use of ICT" means may change as new technologies emerge and become embedded in society.

The contradictory nature of these findings clearly shows that there is no evidence of the existence of a single generation of young students equipped with sophisticated technology skills and with learning preferences for which education is not prepared (Bennett, Maton, & Kervin, 2008; Jones & Shao, 2011). In this sense, Hargittai (2007) demonstrates that SNS usage among young people depends on the individual's gender, race and ethnicity, and parental education background. Therefore, before making radical changes to the current education system, it is necessary to undertake rigorous and empirical studies that investigate students' perceptions of SNSs as academic tools.

In order to shed some light about this topic, we decided to undertake a study with a sample of undergraduate students at the University of Huelva (Spain). The objective of our research is to identify the factors that may motivate these students to adopt and use social network tools, specifically Facebook, for educational purposes. To perform our research, we will administer the survey developed by Mazman and Usluel (2010) to a sample of business students, from different courses and different majors. Conclusions of this study will help us to understand and improve our use of social network tools in educational contexts. Our final goal is to adapt our teaching strategies to the educational needs of our students.

The paper is structured as follows: the next section provides a literature review on the main models and theories that have been historically used to explain the diffusion, acceptance and adoption of technological innovations. In addition, we will review the previous research on the use of social networking tools in educational contexts. The second section details the structural model used and the hypothesis to be tested. The third section describes our data compilation method. We then present and discuss the results of our analysis. To conclude the paper, we identify the limitations of our study as well as the future directions of this research.

2. Literature review

Although previous research on social networks has mainly focused on issues such as privacy, technology, identity, and network structures (Debatin, Lovejoy, Horn, & Hughes, 2009; Dwyer, Hiltz, & Passerini, 2007; Fogel & Nehmad, 2009), several authors have admitted the need to conduct studies that analyze the use of social networking tools in educational contexts (Kabilan, Ahmad, & Abidin, 2010; Lockyer & Patterson, 2008; Mazman & Usluel, 2010; Roblyer et al., 2010). Accordingly, research on Facebook usage by college students has significantly increased during the last years.

A large number of studies concluded that undergraduates generally consider Facebook as a social tool that can ultimately help them transition into college life (Cheung et al., 2011; Greenhow, Robelia, & Hughes, 2009; Madge et al., 2009; Selwyn, 2009).

Madge et al. (2009) describe Facebook as the "social glue" that helps students settle into university life. Although these authors recognize Facebook's educational potential, it is not usually considered by undergraduates as a formal learning tool, but as a means that can potentially support informal learning through communication and interaction (Madge et al., 2009). In addition, the authors recommend professors to be cautious about invading a social networking space that students believe is theirs. Along the same line, Selwyn (2009) concludes that Facebook has become an important site for the informal, cultural learning of "being a student".

Yuh et al. (2010) investigate the impacts of individual online social networking engagement (on Facebook) from a pedagogical standpoint. They conclude that undergraduates' online social networking has a positive impact on university students' learning because helps students attain acceptance from others and adapt to university culture.

Mazer, Murphy, and Simonds (2007) analyze the effect of teacher self disclosure through Facebook. They concluded that students who accessed the Facebook website of a teacher high in self disclosure anticipated higher levels of motivation, affective learning, and a more positive classroom climate, which can lead to better student outcomes. However, participants noted in their responses that professors should be careful in their disclosures because they may damage their credibility (Mazer et al., 2007).

In this sense, Bowers-Campbell (2008) explains how educators can use Facebook as a pedagogical tool to communicate interest and concern for their students. The author argues that Facebook may contribute to improve low self-efficacy and self-regulated learning by increasing communication with instructors and classmates.

Other papers study the impact of Facebook on the learning process of specific subjects. Kabilan et al. (2010) find that university students consider Facebook as a useful and meaningful online environment that can support and improve their learning of English. Schroeder and Greenbowe (2009) explore the effectiveness of Facebook as a communication and discussion tool by creating a Facebook group that

supplements face-to-face classroom instruction for the organic chemistry laboratory. Their study shows that, at least for the course they examined, Facebook promoted an increase in student communication and participation.

Despite the significant increase in the number of papers that examine potential educational uses of Facebook, the ECAR Survey of Undergraduate Students and Information Technology concludes that slightly more than a quarter of the students surveyed said they would like to see greater use of SNSs in their courses (EDUCAUSE, 2012; Smith & Caruso, 2010). As Yang, Wang, Woo, and Quek (2011) claim, after doing a comprehensive literature review, it is necessary to conduct more empirical research on the use of Facebook as an educational tool. Along these lines, Kalin (2012) states that, before we can realize the benefits of technology, we must better understand how our students use it.

To shed light upon this topic, we conduct a study whose objective is to identify the factors that may motivate these students to adopt and use social network tools, specifically Facebook, for educational purposes. Conclusions extracted from this research will help us to understand and improve our use of social network tools in educational contexts so that we can adapt our teaching strategies to the educational needs of our students.

To reach our goal, we will apply a structural equation model specifically designed to explain how users could utilize Facebook for educational purposes (Mazman & Usluel, 2010). This model, developed by the authors after completing a thorough literature review on existing adoption, diffusion, acceptance and usage theories, analyzes the relationships between factors affecting the adoption process of Facebook in relation to the user's existing purposes; educational use of Facebook is explained directly by purposes of Facebook usage and indirectly by Facebook adoption.

3. Research model and hypothesis

Many different models and theories have been historically used to explain the diffusion, acceptance and adoption of technological innovations. While some of these models are focused on individuals' internal decision making processes (Ajzen, 1991; Davis, 1989; Venkatesh & Davis, 2000), other ones stress the importance of innovative factors when analyzing the adoption and diffusion processes (Corrocher, 2011; Lai & Chen, 2011; Moore & Benbasat, 1991; Rogers, 2003).

In this paper, we use the structural model developed by Mazman and Usluel (2010), which considers both the technological and social dimensions of social network applications. This model consists of 3 latent variables (adoption, purpose, educational use) and 11 observable variables (Fig. 1).

3.1. Adoption of Facebook

Adoption of Facebook is included in the model as a latent variable and it is explained by 5 observed variables: Usefulness, Ease of Use, Social Influence, Facilitating Conditions, and Community Identity.

3.1.1. Usefulness and Ease of Use

The Technology Acceptance Model (TAM) was developed by Davis (1989) as an extension of the Theory of Reasoned Action (TRA) (Fishbein & Ajzen, 1975). TAM states that "perceived usefulness (PU)" and "perceived ease of use (PEOU)" are primary motivational factors for accepting and using new technologies.

PU can be defined as *"the degree to which an individual believes that using a particular system would enhance his/ her job performance"* (Davis, 1989) while PEoU refers to *"the degree to which an individual believes that using a particular system would be free of physical and mental efforts"* (Davis, 1989).

In this paper, PU of Facebook is defined as the degree to which an individual believes that the use of Facebook would enhance his/her communication, collaboration and information exchange. PEoU is defined as the degree to which an individual believes that using Facebook would be free of physical and mental efforts.

3.1.2. Social Influence

Social Influence can be defined as "the degree to which an individual perceives that important others believe she or he should use the new system" (Venkatesh, Morris, Davis, & Davis, 2003). Triandis (1980) used a different name for this variable (social factors) and defined it

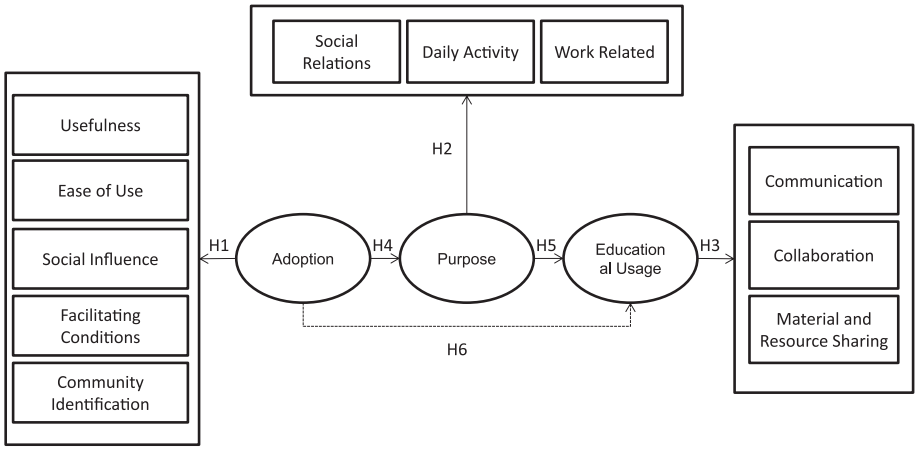

Fig. 1. Research model and hypothesis.

as *"the individual's internalization of the reference groups' subjective culture, and specific interpersonal agreements that the individual has made with others, in specific social situations"*.

For the purpose of this paper, Social Influence is defined as the degree to which an individual perceives the importance of his/her significant other's approval regarding Facebook adoption.

3.1.3. Facilitating Conditions

Facilitating Conditions is an extensive construct that covers many different concepts such as training, support, infrastructure, and knowledge. It is defined as *"the degree to which an individual believes that an organizational and technical structure exists to support use of the system"* (Venkatesh et al., 2003).

In this research, Facilitating Conditions refer to the degree to which an individual believes that there exists an appropriate environmental and technical infrastructure to support the use of Facebook.

3.1.4. Community Identity

Community Identification can be considered as one of the most relevant variables that influence an individual's motivation to participate in virtual communities (Mazman & Usluel, 2010). Virtual communities are groups of individuals who share common interests, goals, and ideas over the Internet (Kim, Lee, & Kang, 2012).

Social identity is characterized by three distinguishing features: solidarity to the social group, conformity to ingroup norms, and discrimination against outgroups (Riedlinger, Gallois, Mckay, & Pittam, 2004). Contrary to personal identity, social identity implies that an individual belongs to a social group (Hogg, 2000, 2012). The individual's identification with a social group has a positive impact on his/her self-image (Apaolaza, Hartmann, Medina, Barrutia, & Echebarria, 2013; Dholakia, Bagozzi, & Pearo, 2004; Valkenburg, Peter, & Schouten, 2006).

Previous research showed that attitudes are significantly influenced by social identity (Terry, Carey, & Callan, 1997). Along this line, Song and Kim (2006) concluded that social identity affects behavioral intention to use a specific technology or service from virtual communities.

Facebook allows users to join common-interest user groups, as well as to share resources and learn from other group members. In this social network, social identity can be described as the individual's identification with a virtual community whose users share the same interests.

- **H1**: Usefulness, ease of use, social influence, facilitating conditions and community identity will have a significant influence on Facebook adoption.

3.2. Purposes of Facebook usage

Facebook is a social network that can be used for many different purposes such as to communicate with others, make new friends or keep in touch with acquaintances, waste time, share information, or discover rumors and gossip (Stutzman, 2006).

Although Facebook has been traditionally used by young people to manage their social lives (Ito et al., 2008; Livingstone, 2009), it can also be used to form or maintain business relationships (Ellison, Steinfield, & Lampe, 2007). In addition, Facebook can be considered as a powerful marketing tool when companies use it to target their messages to specific audiences (Patterson, 2012).

Purposes of Facebook Usage, our second latent variable, is explained by 3 observed variables: Social Relations, Work Related, and Daily Activity.

3.2.1. Social Relations

Social Networking Sites such as Facebook are mainly used for social purposes; individuals can create and maintain social connections over the Internet in a style that is similar to face-to-face communication (Apaolaza et al., 2013; Ellison et al., 2007). Besides, Facebook allows individuals to create virtual communities of users with common interests (McKenna, Green, & Glenson, 2002). These virtual communities resemble life communities because they both provide support, information, friendship and acceptance between strangers.

According to Mazman and Usluel (2010), *"social relations make up an important dimension of Facebook and may include making new friends, maintaining the existing ones and communicating with them. These social groups include neighbors, family members, groups and other people who share common interests"*.

3.2.2. Work Related

Individuals can use Facebook not only to create and promote business relationships but also as a tool to perform many work related tasks; through Facebook users can access and share the information they need to support their work.

3.2.3. Daily Activity

The increasing relevance of Facebook in the current social and working environment is driving individuals to use this social networking tool in their daily activity as well; users can spend their time on Facebook, doing many different activities such as playing games, joining groups, getting updated information from friends, or having fun.

- **H2**: Social relations, work related purposes and daily activities will have a significant influence on purposes of Facebook usage.

3.3. Educational usage of Facebook

Facebook, when it is properly used, can improve the learning process by promoting communication, interaction, collaboration, and resource sharing. While some authors focus on how Facebook can improve students' performance (Dabner, 2012; Kirschner & Karpinski,

2010; Pasek & Hargittai, 2009), other authors conclude that students consider Facebook as a social technology rather than a formal teaching tool (Hew, 2011; Madge et al., 2009; Selwyn, 2009).

The third latent variable of the model, Educational Usage of Facebook, is explained by 3 observed variables: Communication, Collaboration, and Resource/Material Sharing.

3.3.1. Communication

Facebook can be used to create and promote online connections between students and faculty within an academic community (Mazer et al., 2007). This increase in communication may have a positive impact on class discussions, and students' engagement and integration with their peers (Christofides, Muise, & Desmarais, 2009; Ross et al., 2009).

3.3.2. Collaboration

Social Networking Tools such as Facebook may be used to develop new collaboration models. Maloney (2007) concludes that the conversational, collaborative, and communal qualities of SNS enhance the learning process.

3.3.3. Resource/Material Sharing

Students and professors can share many different kinds of educational materials through Facebook in order to complement the traditional learning model.

- **H3**: Communication, collaboration and resource and material sharing will have a significant influence on educational use of Facebook.

The last three hypotheses, H4, H5 and H6, suggest a relationship between the three latent variables of the research model. According to Mazman and Usluel (2010), Facebook adoption is closely related to the purposes of Facebook usage. These authors argue that when people adopt a new system, they use it for different purposes in their daily lives (H4). Finally, they suggest that both adoption and purposes of Facebook usage are in constant influx with the educational usage of Facebook (H5 and H6).

- **H4**: Facebook adoption will have a significant and positive relationship with purposes of Facebook usage.
- **H5**: Purposes of Facebook usage will have a significant and positive relationship with the educational usage of Facebook.
- **H6**: Facebook adoption mediated by the purposes of Facebook usage will have a significant and positive relationship with educational usage of Facebook.

4. Methodology

4.1. Instruments

Data was collected through a questionnaire that was completed by a sample of business students from the University of Huelva (Spain). The first part of the questionnaire consists of students' personal and academic data. The second part contains six questions about students' patterns of Facebook usage. The third part of the questionnaire has 47 questions aimed at assessing the variables of our model (see Appendix A): Perceived Usefulness (PU), Perceived Ease of Use (PEoU), Social Influence (SI), Facilitating Conditions (FC), Community Identity (CI), Social Relations (SR), Work Related (WR), Daily Activities (DA), Communication (CM), Collaboration (CL), and Resource/Material Sharing (RMS). These questions were measured using a five-point Likert scale ranging from 1 "strongly disagree" to 5 "strongly agree".

As we stated in the introduction, the items included in the third part of the questionnaire were totally adapted from Mazman and Usluel (2010). We only changed the Likert scale that was used to measure the items; while they used a ten-point Likert scale, we decided to utilize a five-point scale (Mazman, 2009).

The questionnaire was tested by two experts; after this pre-test, some questions were modified for greater clarity. Although the total number of questionnaires collected was 324, the number of valid responses we used for our analysis was 214.

4.2. Study participants

The demographic profile of survey respondents is summarized in Table 1 including their gender, age, frequency of Facebook usage, intentions for using Facebook, network size on Facebook, and perceptions on using Facebook in class. The results (Table 1) show the predominance of female Facebook users (55.6%) over male users (44.4%). Most Facebook users are 18–23 years old (79%). A majority of participants (76%) use Facebook several times per day and they have a large network size (49%). Most survey respondents use Facebook to stay in touch with friends (98%), to communicate with classmates about course-related topics (92%), and to contact old friends with whom they have lost touch (89%). A great majority of participants would not mind to use Facebook in class (89%); they think it would be convenient for them (78%), and it would give them the opportunity to connect with their classmates (71%). However, some participants (13%) do feel that Facebook is for personal use and not for education; they think that their privacy would be invaded (12.6%).

5. Data analysis and results

Structural equation modeling (SEM) was used to explain the educational usage of Facebook. The SEM analysis is conducted using a two-step approach (Byrne, 2001; Hair, Anderson, Tatham, & Black, 1998; Schumacker & Lomax, 2004). In the first step, a confirmatory factor analysis (CFA) is used to determine the fit of the proposed model to the data and to establish constructs' reliability and validity. The fit indices for all scales (Table 2) indicate that the proposed constructs fit the data well. Given the sensitivity of the chi-square test for the sample size, several different fit indices (χ^2/df, CFI, GFI, TLI, and RMSEA) are reported (Byrne, 2001; Hancock & Mueller, 2001; Kline, 2005; Schumacker & Lomax, 2004) in Table 2.

Table 1
Demographic profiles and descriptive statistics of respondents.

Item		Frequency	%
Gender	Male	95	44.4
	Female	119	55.6
Age	18–20	78	36.4
	21–23	92	43.0
	24–26	21	9.8
	26+	23	10.7
Frequency of Facebook usage	Once a day	21	9.8
	2–5 times a day	81	37.9
	6–10 times a day	83	38.8
	11–15 times a day	21	9.8
	16–20 times a day	5	2.3
	More than 20 times a day	3	1.4
Purposes of using Facebook	Stay in contact with friends	211	98.6
	Communicate with classmates about course related topics	197	92.1
	Allow other people to know what happens in my life	9	4.2
	Contact with people I had lost touch	191	89.3
	Build professional relationships	14	6.5
	To flirt	8	3.7
	Other	9	4.2
Network size (friends on Facebook)	1–40 friends	22	10.3
	40–80 friends	54	25.2
	80–140 friends	47	21.9
	140–180 friends	58	27.1
	More than 180 friends	33	15.4
Opinion about using Facebook for academic purposes	It would be convenient	167	78.0
	It would be an opportunity to connect with classmates on SNS	152	71.0
	Facebook is personal/social, not for education	29	13.5
	My privacy would be invaded	27	12.6
	I would not mind	191	89.3
	Others	8	3.7

To establish the reliability and validity of the constructs in the hypothesized model, the results of CFA for each of the first and second order latent variables are given in Table 3. Each item statistically significantly loaded on its corresponding factor. In addition, each subscale significantly loaded on its higher second-order factor (Table 3). All factor loadings are high in value and statistically significant. Furthermore, the average variance extracted (referred to as AVE) exceeds the threshold of 0.50 assuring the convergent validity (Anderson & Gerbing, 1988; Fornell & Larcker, 1981; Koufteros, 1999; Roldán & Sánchez-Franco, 2012). We assess the discriminant validity by comparing the square root of AVE with the correlations between constructs. Evidence of discriminant validity is provided by the fact that the AVE for each construct is greater than the squared correlation between that construct and any other construct in the model (Fornell & Larcker, 1981). The correlation matrix and square root of AVE are presented in Table 4. All constructs show satisfactory reliability as the composite reliability estimates exceed the 0.70 cut-off value (Nusair & Hua, 2010). The three second order constructs were also significantly inter-correlated. The correlation coefficient between adoption and purpose was 0.82, between adoption and education use was 0.63, and between purpose and education use was 0.79.

The results (Table 3, column 7) show that *usefulness*, *ease of use*, *social influence*, *facilitating conditions* and *community identity* have significant ($p < 0.01$) positive influence on adoption ($\beta = 0.72$, $\beta = 0.63$, $\beta = 0.92$, $\beta = 0.88$, $\beta = 0.82$); *social relations*, *work related* and *daily activity* have significant ($p < 0.01$) positive influence on purpose ($\beta = 0.95$, $\beta = 0.71$, $\beta = 0.88$); and *communication*, *collaboration*, and *resource and material sharing* have a significant ($p < 0.01$) positive effect on educational usage of Facebook ($\beta = 0.96$, $\beta = 0.97$, $\beta = 0.92$).

Furthermore, the results (Table 5) show that the Facebook adoption has a significant positive effect on the purposes of Facebook usage ($\beta = 0.89$, $p < 0.01$). In addition to this, it is found that Facebook adoption with its determinants account for approximately 81% of the variance of purposes of Facebook usage. Purposes of Facebook usage has a significant positive effect on the educational usage of Facebook ($\beta = 0.76$; $p < 0.01$) Lastly, the results indicated that Facebook adoption had a significant positive indirect effect on educational usage of Facebook ($\beta = 0.66$; $p < 0.01$) and the total variance explained in educational usage of Facebook either directly by purpose of Facebook usage or indirectly by Facebook adoption is 54.4%.

Table 2
Fit indices for the second order measurement model for Facebook.

Fit indices	Perfect fit	Accepted fit	Model fit results Facebook (second order)	Model fit results Facebook (first order)
χ^2/df	χ^2/df < 3	3 < χ^2/df < 5	1.63	1.53
CFI	0.97 < CFI < 1	0.95 < CFI < 0.97	0.96	0.93
GFI	0.95 < GFI < 1	0.90 < GFI < 0.95	0.92	0.92
TLI	0.95 < TLI < 1	0.90 < TLI < 0.95	0.94	0.92
RMSEA	0 < RMSEA < 0.05	0.05 < RMSEA < 0.08	0.054	0.055

Table 3
First and second order CFA for educational use of Facebook.

Second order construct	First order constructs	Items	First order factors			Second order factors		
			Factor loadings	CR	AVE	Factor loadings	CR	AVE
Adoption	Usefulness	PU5	0.71**	0.78	0.52	0.72**	0.90	0.65
		PU4	0.65**					
		PU3	0.75**					
		PU2	0.63**					
		PU1	0.57**					
	Ease of use	PEOU5	0.94**	0.86	0.55	0.63**		
		PEOU4	0.93**					
		PEOU3	0.85**					
		PEOU2	0.72**					
		PEOU1	0.59**					
	Social influence	SE5	0.69**	0.74	0.51	0.92**		
		SE4	0.65**					
		SE3	0.76**					
		SE2	0.56**					
		SE1	0.53**					
	Facilitating conditions	FC7	0.73**	0.80	0.50	0.88**		
		FC6	0.63**					
		FC5	0.53**					
		FC4	0.57**					
		FC3	0.52**					
		FC2	0.58**					
		FC1	0.69**					
	Community identification	CI4	0.78**	0.76	0.53	0.82**		
		CI3	0.60**					
		CI2	0.85**					
		CI1	0.67**					
Purpose	Social relations	RS1	0.77**	0.83	0.49	0.95**	0.87	0.68
		RS2	0.68**					
		RS3	0.72**					
		RS4	0.68**					
		RS5	0.77**					
		RS6	0.74**					
	Work related	WL1	0.86**	0.81	0.64	0.71**		
		WL2	0.92**					
	Daily activities	DA1	0.69**	0.74	0.58	0.88**		
		DA2	0.76**					
Education use	Communication	CA1	0.72**	0.89	0.56	0.96**	0.95	0.77
		CA2	0.82**					
		CA3	0.81**					
		CA4	0.83**					
		CA5	0.82**					
		CA6	0.86**					
	Collaborations	C1	0.84**	0.88	0.69	0.97**		
		C2	0.87**					
		C3	0.88**					
	Material and resources	RM1	0.91**	0.82	0.68	0.92**		
		RM2	0.92**					

**Significant at 0.01 level.

6. Findings and discussion

We used the structural equation model developed by Mazman and Usluel (2010) to explain three dimensions of the educational use of Facebook: communication, collaboration, and resource/material sharing. This model hypothesizes that the educational use of Facebook is explained directly by purposes of Facebook usage and indirectly by Facebook adoption.

Our results show that Perceived Usefulness (PU), Perceived Ease of Use (PEOU), Social Influence (SI), Facilitating Conditions (FC), and Community Identity (CI) have a significant positive influence on Adoption of Facebook. Contrary to the findings of previous research, our results show that ***Social Influence*** is the most important factor in predicting the adoption of Facebook. Prior studies (Mazman & Usluel, 2010, King & He, 2006; Ngai, Poon, & Chan, 2007; van Raaij & Schepers, 2008) concluded that Perceived Usefulness was the most important factor in predicting the adoption of virtual learning environments.

According to the Social Influence Theory, the changes in attitudes and actions produced by Social Influence may occur at different levels: compliance, internalization, and identification (Kelman, 1958). In our study, social influence changes students' attitudes and actions at the identification level. Identification occurs when people are influenced by someone who is liked and respected (Kelman, 1958); our results show that students are influenced to adopt Facebook because they want to establish or maintain contact with other people with whom they share interests and values. These results are consistent with the findings of previous studies that explore the factors that may lead students to use SNS such as Facebook (Cheung et al., 2011).

Table 4
Correlation matrix and square root of AVE.

Variables	1	2	3	4	5	6	7	8	9	10	11
1. Usefulness	**0.72**										
2.Ease of use	0.29	**0.74**									
3.Social influence	0.64	0.50	**0.71**								
4.Fac_conditions	0.68	0.56	0.68	**0.71**							
5.Com_identity	0.41	0.39	0.69	0.69	**0.73**						
6.Res_material	0.55	0.22	0.45	0.53	0.49	**0.82**					
7.Collaborations	0.54	0.31	0.52	0.54	0.54	0.70	**0.83**				
8.Communication	0.65	0.33	0.58	0.50	0.53	0.63	0.69	**0.75**			
9.Daily activities	0.48	0.31	0.51	0.46	0.48	0.39	0.40	0.47	**0.76**		
10.Work related	0.59	0.22	0.36	0.37	0.32	0.63	0.63	0.70	0.41	**0.80**	
11.Social related	0.61	0.41	0.66	0.65	0.67	0.59	0.59	0.59	0.63	0.50	**0.70**

All correlations are significant at 0.05 levels.
Square roots of AVE are reported in diagonal (bold).
All correlations are rounded to two decimal places.

Table 5
Path coefficients.

Paths	Facebook	
	Direct	Indirect
Purpose ← adoption	0.89**	–
Education ← purpose	0.76**	–
Education ← purpose ← adoption	–	0.66**

**Significant at 0.01 level.

Cheung et al. (2011) conceptualized the use of SNS as intentional social action and analyzed the role that social influence, social presence, and the five key values from the uses and gratification paradigm can play on the We-Intention[1] to use SNS. The results of the empirical study conducted by the authors showed that We-Intention to use online social tools is strongly determined by social presence. Along the same line, the paper concludes that social related factors have the most significant influence on the intention to use.

Our findings also revealed that ***Facilitating Conditions*** is the second most important factor in predicting the adoption of Facebook. According to students' responses, facilitating factors such as the help menu or support services to manage Facebook activities, are relevant drivers of Facebook adoption.

In addition, our results show that Social Relations, Work Related Issues, and Daily Activity have a significant positive influence on Purposes of Facebook Adoption. Using Facebook for social purposes is perceived as the most important factor among all of the purposes collected. In the same vein, Hew (2011), Madge et al. (2009) and Selwyn (2009) concluded that Facebook is mainly used for social reasons; students consider Facebook predominantly as a social tool and they use it to maintain connections with others, to follow updates about friends, to plan social events, or to make new friends (Bosch, 2009; Ellison et al., 2007; Joinson, 2008; Lewis & West, 2009; Pempek, Yevdokiya, & Calvert, 2009; Urista, Dong, & Day, 2009).

This research also found that Communication, Collaboration, and Resource/Material Sharing have a significant positive effect on Educational Use of Facebook. Finally, our results show that Facebook Adoption has a significant positive effect on the Purposes of Facebook Usage. And Purposes of Facebook Usage has a significant positive influence on the Educational Usage of Facebook.

Several studies explore the potential of Facebook as a learning resource that promotes collaborative and cooperative learning (Irwin, Ball, Desbrow, & Leveritt, 2012; McCarthy, 2012). Irwin et al. (2012) developed Facebook pages for four university courses to analyze student's perceptions of Facebook as an interactive learning tool. Students in favor of using Facebook for academic purposes stated many reasons for the course Facebook page being an effective learning resource such as increased interaction and participation in discussions about course topics, and exposure to relevant media and learning materials. However, some concern was raised about the need to keep updated with the course Facebook activity (Irwin et al., 2012). The research conducted by McCarthy (2012) revealed that students considered Facebook as a valuable learning resource that improved the development of academic connections, and promoted academic critiques, discussion, and networking.

Even though Facebook has the potential to enhance the learning experience, its use has not made significant inroads into classroom usage; according to some authors, faculty members are reluctant to incorporate this technology into their teaching strategies (Ajjan & Hartshorne, 2008; Cloete et al., 2009; Roblyer et al., 2010). But the majority of students in our research stated that they would not mind using Facebook as a learning tool (89.3%); they believe it is a useful resource (78%) that would give them the opportunity to communicate with classmates (71%).

Based on the conclusions of our research, we recommend the incorporation of Facebook into the learning resources of universities. Professors should take advantage of the social nature of Facebook to increase the communication, collaboration, and participation of the learning process. However, it is essential to analyze how students use this technology and understand how the social dimension of Facebook can enhance the learning outcomes. Equally important would be to show professors the potential of Facebook to improve the learning experience and increase the productivity of academic activities.

[1] We-Intention can be defined as a "commitment of an individual to engage in joint action and involves an implicit or explicit agreement between the participants to engage in that joint action" (Toumela, 1995).

7. Conclusions, limitations, and future research

The world of higher education has dramatically changed in recent years and Internet technologies have played a key role in this transformation. Although Web 1.0 vastly expanded access to information, users were mere consumers of content. Now, thanks to Web 2.0 tools, Internet users can create their own content and interact with other users; these features can improve the learning experience when properly used.

Despite the potential of Web 2.0 resources to improve the learning process, their use has not made significant inroads into classroom usage. In order to shed some light about this topic, we decided to analyze the factors that may motivate students to adopt and use Web 2.0 tools, specifically SNS, for educational purposes. We focus our study on Facebook due to the increasing popularity of this SNS among college students.

The contribution of our study includes the validation of the model developed by Mazman and Usluel (2010) to explain the educational usage of Facebook. We applied this model to a different sample, from a different geographic location (business students from the University of Huelva, Spain) because our main goal is to understand the factors that may lead our students to adopt Facebook for educational purposes. This knowledge will help us identify different strategies we can develop to increase its adoption so that we can fully realize the benefits of using Facebook to improve the learning experience.

According to Hofstede (2001), the cultural differences between countries have an impact on the meaning people attach to various aspects of life. These differences may influence students' behavior, learning styles, expectations, and norms. If we as professors want to take full advantage of the potential of Facebook to promote collaborative and cooperative learning, it is necessary to reach a full understanding of our students' perceptions of Facebook for academic purposes.

The use of Internet technologies for educational purposes can be considered as one of the main changes that have taken place in the academic world over the last years. And change management is one of the many cases where the Hofstede Model of national culture can be applied. As the author states in the Hofstede Centre website, "*the preparation and implementation of change is highly culturally sensitive*" (http://geert-hofstede.com). For this reason, it is essentials to conduct studies like the one we just performed. If we really want to embrace change in the education system, we need to understand the attitudes and behavior of students from different countries.

From a theoretical perspective, this research provides additional evidence about the appropriateness of using the model developed by Mazman and Usluel (2010) to explain the educational usage of Facebook. According to our results, ***Social Influence*** is the most important factor in predicting the adoption of Facebook; students are influenced to adopt Facebook to establish or maintain contact with other people with whom they share interests. Regarding the purposes of Facebook usage, ***Social Relations*** is perceived as the most important factor among all of the purposes collected.

It can be concluded that the social nature of Facebook is driving its adoption and use among college students. This conclusion suggests important practical implications; as professors, our challenge would be to take advantage of the social dimension of Facebook to enhance the learning experience of our students by increasing the communication, collaboration and participation of the learning process.

Our results are consistent with those reached by Mazman and Usluel (2010). Students from the University of Huelva are also enthusiastic about using Facebook to interact with their friends, relatives, and classmates. This enthusiasm has a positive influence in their perceptions of Facebook as an educational tool. After using Facebook for social purposes, it may easier for students to acknowledge the potential advantages of this tool to share educational materials, and to communicate with their classmates and professors.

But there are other factors that do contribute to this positive attitude toward Facebook such as the perceived ease of use and perceived usefulness of this tool; students believe that using Facebook would be free of physical and mental efforts and will allow them to improve their communication, collaboration and information exchange. In addition, our results show that students are inclined to adopt Facebook because it is used by their friends and significant others. Perceived compatibility with students' values, needs, and past experiences is another variable that has a positive impact in the adoption of Facebook.

Finally, and consistent with the conclusion reached by Mazman and Usluel (2010), our study shows that Facebook Adoption has a significant positive effect on the Purposes of Facebook Usage; and Purposes of Facebook Usage has a significant positive influence on the Educational Usage of Facebook.

Although Facebook was not originally designed for educational purposes, it has a great potential to enhance the learning experience. As several authors state, Facebook can promote collaborative models of learning, connect students and instructors, increase learners' motivational level, and create a more comfortable classroom climate (Goertler, 2009; Mason, 2006; Mazer et al., 2007). In addition, Facebook can create strong communities of practice for teaching and learning that expand the learning process beyond the boundaries of a traditional classroom (Yang et al., 2011).

Despite the endless possibilities offered by Facebook to enhance the learning experience, we must remember that it is only a tool that should never replace a good teaching strategy. Professors need to plan the learning process very carefully; they need to clearly articulate course objectives, learning goals, and student expectations. In addition, professors must design and coordinate teaching activities that engage students and require interactive participation, focusing on concepts and insuring that the students understand the material (Tay & Allen, 2011). Facebook can be considered as one of the teaching methodologies professors can use to enhance the teaching-learning process.

In addition, we should remember that, according to the ECAR Study of Undergraduate Students and Information Technology (ECAR, 2012), students have relatively negative attitudes toward the instructor initiated use of Facebook for academic purposes; most students reported that they see social networks as more about connecting with friends and less about doing academic activities and they prefer to keep their academic and social lives separate. In addition, the ECAR study reports that students do care about their privacy when it comes to communicating with instructors through social media (students "friending" their professors is still taboo for most students).

As professors, we face a big challenge: we need to find an appropriate way to take advantage of the social dimension of Facebook to enhance the learning experience of our students without making them feel uncomfortable. Before using Facebook for class purposes, the professor should provide specific training about the features of Facebook that will be used in the course and address any kind of concern expressed by students. Along these lines, Hurt et al. (2012) recommend professors to review the privacy and individual group settings as well as the use of a "shell profile" for the professor with no personal information and just a professional picture. This option would mitigate students' concerns about invasion of privacy by professors (Madge et al., 2009). We believe these recommendations are essential to take advantage of the many capabilities of Facebook for educational purposes.

One of the limitations of this research is related to the sample. All the students who participated in our study come from the same institution. Future research could collect and compare data from multiple universities and colleges. An interesting extension to this study would be to compare students' perception of Facebook in small liberal arts colleges, focused on teaching, with other types of institutions such as bigger and research oriented universities. It would also be interesting to conduct future studies with students from different countries to determine whether differences in sociocultural contexts have an impact on Facebook adoption and use.

Another limitation would be the fact that we focused our study on a specific SNS. There are many other types of Web 2.0 technologies and their use and impact on teaching could differ. It would be worthwhile to perform academic research about students' perceptions of other tools such as wikis, blogs, or social bookmarking.

To summarize, we can conclude that Facebook has the potential to promote collaborative and cooperative learning. But, in order to take full advantage of the social dimension of Facebook, it is necessary to understand how students interact with this technology. And finally and most importantly, we should never forget that information and communication technologies (ICT) should be used only if they are appropriate to support course goals and outcomes.

Appendix A. Questions used in the study

Construct	Variables	Survey items
Perceived Usefulness (PU)	PU1	Facebook allows me to communicate with more people in a short time period.
	PU2	Facebook allows me to share more in a short time period.
	PU3	Facebook makes it easier to establish and maintain personal relationships.
	PU4	Facebook allows me to have more control over my relationships.
	PU5	In general, the use of Facebook improves my personal relationships.
Perceived Ease of Use (PEoU)	PEoU1	I became a Facebook member with ease.
	PEoU2	My interaction with Facebook is clear and understandable.
	PEoU3	I don't have any problems learning about Facebook features on my own.
	PEoU4	I find it easy to use Facebook features.
	PEoU5	In general, I find it easy to use Facebook.
Social Influence (SI)	SI1	I use Facebook because my friends recommended that I do.
	SI2	I pay more attention to the Facebook features used by my friends/contacts
	SI3	I use Facebook to communicate and share information with people around me.
	SI4	I use Facebook because many people I know expect me to use it.
	SI5	I use Facebook mostly to fit in since many people I know use it.
Facilitating Conditions (FC)	FC1	I find necessary resources to use Facebook with ease.
	FC2	Anyone can help me use Facebook.
	FC3	Facebook offers technical support when needed.
	FC4	I can get technical support by email if I have problems using Facebook.
	FC5	I can connect to Facebook whereever there is Internet connectivity.
	FC6	Facebook is similar to other social networks I use (msn, e-mail, online forums).
	FC7	In general, Facebook offers appropriate support.
Community Identity (CI)	CI1	Using Facebook I can create groups to share information with others that have the same interests.
	CI2	Using Facebook I can join groups that I am interested in.
	CI3	Facebook allows the creation of groups of people who share the same interests and needs.
	CI4	I use Facebook to work as a team with the other members of the groups I joined
Social Relations (SR)	SR1	I use Facebook to locate friends I havent been in touch with for a while.
	SR2	I use Facebook to find new friendships.
	SR3	I use Facebook to communicate with my friends.
	SR4	I use Facebook to share information and resources with my friends.
	SR5	I use Facebook to join groups to communicate about common interests.
	SR6	I use Facebook to be updated on the events of my previous school and former classmates
Work Related (WR)	WR1	I use/would use Facebook to communicate with my classmates about homework and group projetcs.
	WR2	I use/would use Facebook as a resource to increase my performance in my courses.
Daily Activity (DA)	DA1	I use Facebook to get up to date information and news about my contacts.
	DA2	I use Facebook to find out what is new and innovative.
Communication (CM)	CM1	The use of Facebook improves communication between classmates.
	CM2	The use of Facebook improves communication between the teacher and the students.
	CM3	The use of Facebook improves classroom discussions.
	CM4	The use of Facebook improves the delivery of course content and resources.
	CM5	The use of Facebook improves the communication of announcements about courses, classes or school.
	CM6	Facebook provides resources to support students when doing their homework.
Collaboration (C)	C1	The use of Facebook encourages the creation of academic groups (communities) of people with the same interests and needs.
	C2	Facebook is an appropriate platform to exchange course related information.
	C3	The use of Facebook improves student group work.
Resource/Material Sharing (RMS)	RMS1	Facebook provides the resources to share a wide variety of resources and learning materials.
	RMS2	Facebook provides rich multimedia resources and media support to improve the educational experience.

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