

UX of social network Edmodo in undergraduate engineering students

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Abstract — The main objective of this research is to describe the use that students make of an academic SNS (social network service) and detail the relationship between socio-demographic and academic factors associated with the use of EDMODO and the perception of the contribution to the acquisition of skills for the future career. In the analysis of user experience, participants positively evaluated EDMODO and found that the level of satisfaction is positively associated with the academic results obtained, and negatively with perceived usefulness in terms of the impact on their grades.

Keywords — social networking, user experience, Technological Acceptance model (TAM), university education, EDMODO.

I. INTRODUCTION

WE face changes in the near future employment trends influenced by extreme longevity, automation, computing and globally connected world, new media ecology, and super structured organizations which makes it necessary for new and old professionals to develop specific skills for the workplace in 2020, to develop computational thinking, design-oriented mentality, cognitive load management, new knowledge about media, multidisciplinary, critical thinking, social intelligence, innovative thinking and professionals adaptability, cross capacity and virtual collaboration (Davies et al., 2011).

The concern about the development of these skills is perhaps one of the reasons that has led some educators to reap the benefits that Web 2.0 offers to transform the teaching and learning as part of the natural development of today's world, in which divisions and barriers are becoming more diffuse and which tends more to a sense of collaboration than to competition. A suitable environment for Web 2.0 is what brings and transcends of constructivism and social learning that favors the use of Learning 2.0, cheaper costs, expanding the possibility of interaction, contribution to the development of skills required to globally, among others. In this context, the most important tools in the educational space are Wikipedia, Blogs, MOOCs, e-portfolio and SNSs.

Given the potential offered by SNSs in the educational context, it is useful to analyze how they are perceived by students, which factors affect this perception, and how it relates to their academic performance. The scenario for the development of this study is the subject Business Management I, which is compulsory for all programs assigned to face undergraduate Industrial Engineering of the University of Santander students. To do this, a pedagogical practice is implemented from the concept of hybrid learning environment, keeping the requirements of a classroom course, but including educational EDMODO social network as a mechanism to facilitate collaboration and interaction.

The SNSs are defined as services based on the web that allow individuals to build a public or semi-public profile within a bounded system, articulate a list of other users with whom they share a connection and view and traverse their list of connections and those made by others within the system. Also allow the generation of semi-

persistent public comments (Boyd, Danah & Ellison, 2007).

It is undeniable the impact of SNSs in today's society, 2014, 1.59 billion people were users of these services (Statista, 2015). In Colombia 77% of the population has access to internet (Ipsos, 2012), 99% of Colombian youth between 15 and 17% use them and the 84% for between 18 and 24 years. The most popular SNS is Facebook 100% and 92% followed by Twitter 66% and 69%, YouTube 55% and 67%, LinkedIn 0% and 30%, respectively (E-marketing, nd).

So we can infer that almost all Colombian university students are SNSs users, and like colleges all over the world, belong to the "Gen Y" (born after 1982) are considered adept at "multitasking", in the teamwork, in the scanning and easily navigation in technology; they are multimedia and interactive. Although these students have a more natural relationship with technology than adults, it is clear that young disadvantaged sectors have very low technological skills despite computer technology courses received in school (Cabra Torres & Martial Vivas, 2009).

II. THEORETICAL REVIEW

A. The ratio of Colombian students with ICT

Cortés & Carbonell (2014) point out that Colombian University is generally characterized by a controlled use of internet connection with an average of 3.63 hours a day and social networks are the main activity carried out. The minority, corresponding to 9.7%, has a problematic use, defined as the carelessness of academic, industrial or domestic activities and their replacement by online activities, being intensive, in Colombia, the email and SNSs, founding in these students a negative correlation between kindness and responsibility. In relation to the appropriation of ICT in higher education students (Berrio & Rojas, 2014), indicate that it is the student's attitude towards ICT that determines their appropriation and application, where a strong relationship with the perception of impact is not found productive and, even when respondents had optimal conditions of access, these tools were still seen as objects of fashion and status. Finally, regarding the contribution of education to the collaborative SNSs (Bravo, Pedraza, & Herrera, 2012) it was founded that students generally perceive that Twitter encourages learning and positively contributes to the achievement of the results of the course. However, a significant percentage (30%) indicated that Twitter does not contribute to the development of collaborative work. In addition, weaknesses were observed in the dialogic communication, since 80% of the participations do not fall within the characteristics of this type of interaction.

B. The development of job skills 2020

It is considered that the educational process have to transcend the fact of training specialists to generate citizens in a society where both virtual and real network is its fundamental support then, the ability to understand how to join and build these networks, and the tools to do the purpose, the intention, protocols and standards governing the use and

communication become increasingly important skills (Castells, 2014).

In the same line, the International Conference on Education 2012–2013, in their inter discussion, concludes that the ultimate goal of education is to form a citizen, not just a professional: a creative, entrepreneurial, critical, with high social skills, adapted to various work environments and competent in the digital world. And for this proposal, the educational process should contribute to exploiting the potential of the digital society, drawing collective intelligence from a new methodological approach linked more to interact and create content, and less just to their absorption, relying on the benefits of the turned-pedagogical use of ICT to develop skills from pedagogy with special focus on the interests of the learner, who should be formed to prevent “technological anxiety”.

Taking into account comments made by the “Institute for Future” SNSs implementation of the educational process, in conjunction with appropriate teaching and learning methodologies would have a potential to develop the ability of virtual collaboration and tangential contribution to the ability of the management of cognitive load, defined by Davies et al. (2011) as follows:

Ability to virtual communication, defined as the ability to participate, engage and motivate scattered groups that connect through technology enabling work, share ideas and be productive.

Managing the cognitive load, ability to face the avalanche of information, learning how to filter it, focusing on what is important or in the words of Castells (2014), the Internet Society, which is more complicated is not to navigate, but know where go, where to look for what you want to find and what to do with what is found, and this requires education.

C. Social networks in education

The contribution of social networks to education is still in discussion, and their advocates relate their greatest potential contribution to the generation of content (Rennie & Morrison, 2013) of which derive theoretical benefits as the provision of tools for participation, closing of gaps, development of social skills and motivation of young people to make use of shared spaces and communications, a situation that captivates them deeply. Additionally, it allows constant and economic update information if existing and known or previously explored by the student spaces are used. This position is supported by different authors.

By having tools that facilitate participation, generated by other communication schemes there are overcome barriers such as time, space and restrictive elements as cultural norms, behavioral, gender, among others (Bulbulia, Blewett, Quilling, & Kanyiwamuyu, 2010). It also facilitates the creation of community, which in the current context is given more based on affinities and less on geographical proximity as traditionally occurred. These tools also extend the traditional classroom, allowing users to join with others with similar educational interests (Pollara & Zhu, 2011) and nurturing interactions and varied typology documents and communicate more interactively combining both the sound, video and documents (Hernandez, 2008 cited in (Sarsa, 2014). Also tutoring is expanded, ensuring flexibility and ease of use by mentors and mentees promoting their success, given that the most frequent contact between mentor and mentee generates better effects (Podoll & Randall, 2005;. Dubois et al, 2002 cited in (Pollara & Zhu, 2011)).

Increasing opportunities for participation, creativity is potentially potentiated (Cabero & Marin, 2014) and a more interactive space and a dynamic learning is encouraged (Smith & Guzman, 2011 cited in Cabero & Marin, 2014), so it provides active learning and collaboration (Pollara and Zhu, 2011) with benefits in increasing motivation and encouraging academic performance, from the experiential reinforcement between individual learning and collective, which contributes to the retention

and skills development including multidisciplinary and critical thinking.

Additionally, it provides computer literacy, as it is shown that not all young people are “digital natives”, so efforts allowing technological appropriation and the factors that modulate this process are still required (Berrio & Rojas, 2014). It is needed to take into account the subsequent contribution to academic performance, from the spaces generated to address concerns that may facilitate monitoring by teachers, with personalized feedback encouraging the organic development of knowledge that impacts retention concepts (Rennie & Morrison, 2013).

Closing gaps contributes to the experience, that is, if teachers will use in the academic context the same instruments that students often use to communicate, the best solutions to help a better teaching molded to the characteristics of students could be identified, optimizing those variables that are the engine of learning (the emotion) and stimulating higher character skills (awareness and liberality), in addition to finding new forms of multiple literacy (Costa, Cuzzocrea, & Nuzzaci, 2014).

Regarding the development of social skills, (Valkenburg & Peter, 2009) conclude that the use of SNSs contributes positively to peer relations of adolescents and facilitates interaction with existing links (Boyd & Ellison, 2007; Haythornthwaite, 2011) where mean-face relationships and promote and collaborative work management benefits other groups as improving social relationships are inferred. Tolerance towards people of the group, extends the ability of social support, integration and cohesion in groups (Cabero & Marin, 2013), social capital formation and development of social trust (Ellison, Steinfeld, & Lampe, 2007; Valenzuela, Park, & Kee, 2009).

It also allows the development of communication skills to facilitate joint communication, as elements of oral communication with written ones are combined (Linne, 2014). They are scenes of self-expression, communication and self-advocacy, and collaborative work. Other individual benefits are derived such as the development of intrinsic motivation and self-esteem and skill acquisition of democratic leadership and participation (Cabero & Marin, 2013).

In contrast, there are positions that refute the positive impact of SNSs the learning process, and although they share the same risks contents, contact, and commercial Internet (De-Moor, Dock, Gallez, & Lenaerts, 2008), arouse a special fear in teachers and parents, as in the environment of the youth, (Douglas et al., 2008), the fact of devoting too much time to this services has negative influences on the habits and daily routines, qualifications and relationships in general. Moreover, it has come to speak of the perceived stress when it is impossible to connect the web (Labrador & Villadangos, 2010).

In relation to content, there is plenty of unfiltered and unauthenticated information and most students lack the critical skills to discern in this mass of undifferentiated material. Web 2.0 critics express concern about trust, reliability and credibility (Rennie & Morrison, 2013), as well as traceability to the power sources and fragmentation of content (Rennie & Morrison, 2013), so to know how to manage cognitive load would help positively to overcome this risk.

In contact risks and situations relating to privacy, the use of these services can have a negative impact and the destruction of the traditional roles of teacher and student (Sickler, 2007). But if using closed SNSs, this conflict will tend to zero.

Commercial risks are not observed as relevant to the object of study, but it should expand the above classification with the category of “academic risks” that may result from the continued and disruptive used of the SNSs.

This is how new technology encourages a short span of attention and takes students to demand immediate answers instead of thinking for themselves. In addition, not everyone agrees that “Millennials”

are so different from their predecessors, consequently and according to this, various educational techniques should be maintained (Rennie & Morrison, 2013). In some cases it does not have a real value for learning (superficiality and informality), discouraging the development of traditional skills and competences (Pollara and Zhu, 2011).

Other authors consider that, in terms of opportunities to socialize and work within the academic processes, this need is covered by the Learning Management Systems (LMS), but studies show that participation in SNSs like Facebook is far superior to that of tools exclusively dedicated to learning processes (Pollara & Zhu, 2011).

Finally, investigations as presented by Kirschner & Karpinski (2010), Junco (2012), Karpinski, Kirschner, Ozer, Mellott, & Ochwo (2013) found a negative relationship between academic achievement (GPA) and the use of Facebook, a relationship between the promotion of the use of the SNSs and the “Multitasking” and loss of efficiency and effectiveness in the learning process, resulting in lower average tendency to procrastinate and weaknesses in time management.

D. EDMODO

Edmodo is a social platform for education, where the interaction process works through a wall, in which resources are shared, conversations are generated, concerns are posted and attended and hierarchies are eliminated, allowing the development of communication skills and argumentative easily co-evaluation. The similarity with Facebook theoretically reduces the learning curve and to be a closed educational SNSs avoids the phenomenon of “creepy tree house.”

E. MAT Model

The TAM model (Davis, 1989) is a methodology to measure the successful implementation of a tool and the factors influencing their appropriation, so it can considered as mature and highly used (Yong, 2004). It argues that the probability of acceptance of a technological tool is a function of the perceived usefulness (Perceived Usefulness-PU) and perceived ease of use (Perceived Ease of use- PEOU).

With regard to the implementation of EDMODO, investigations collect the research experiences of application of this tool (Enriquez, 2014; Holland & Muilenburg, 2011; Kongchan, 2008; Ractham & Chen, 2012; Sanders, 2012; Thien et al, 2013.)

In particular, a study becomes an important theoretical reference since it addresses the evaluation of the social network Edmodo from the Technology Acceptance Model TAM (Thongmak, 2013).

The case presented by Thongmak describes the experience of implementing EDMODO following the recommendations made by some authors address about the importance of integrating natural environments for students in the teaching-learning process, as in this case, a SNS. It analyzes factors that can limit or support the adoption of this tool to increase levels of collaboration, with the studied variables: Ease of Use, Perceived Usefulness, Characteristics of the teacher and student and intended use, concluding that the first three mentioned are the key to the appropriation of this tool factors. Additionally, in their literature review, he emphasizes on the weak ownership of SNSs in education and consequent few studies providing insight into the uses and effects of its application in academic processes.

F. Problem Statement

Throughout studies reported in the literature, a consensus on the impact of SNSs in academic settings is not reached. On the one hand, authors (Boyd & Ellison, 2007; Bulbulia et al, 2010; Ellison et al., 2007; Haythornthwaite, 2011; Linne, 2014 Pollara & Zhu, 2011; S. Valenzuela et al, 2009;. Valkenburg & Peter, 2009) argue that the impact is positive, but literature that claims otherwise is also located. Additionally, there are few studies in the Colombian context

providing insight into the uses and purposes of the application of SNSs in academic processes. For this reason, it is convenient to conduct a research in classrooms intervening and evaluating the impacts of SNSs.

The general aim of this research is to evaluate the level of satisfaction of college students by implementing EDMODO, to determine factors associated with acceptance and to identify mechanisms to effectively incorporate social tools applied to the academy. Also, to describe the use that students make on educational social network EDMODO so as to characterize users and understand how the use of SNSs can contribute to academic success and / or skills development as virtual collaboration and skills cognitive load management.

G. Methodology

Type of study	Exploratory, with quasi-experimental analysis of quantitative and qualitative information.
Techniques used	Consultation university records, observation and survey filled out with auto-tracking research.
Instruments	And standardized observation sheet with open and closed questions questionnaire.
Studied universe	Students of the subject Business Management UIS ending the semester 2013-2, 2014-1
Sample size	Control group: 47 students Intervention group: 92 students
Academic variables	Academic program, level (semester), academic Trust (cumulative average above), academic performance (final grade for the course).
Sociodemographic variables	Age, Sex, College where he studied the (public or private), Origen, and NSE (socioeconomic status in Colombia).
Variables “Gen Y” (Millennials)	Investigates the perception of the respondent against the generation gap in the teaching-learning process and contribution of ICT and SNSs in the trend and multitasking
UX variables (User Experience)	Check overall satisfaction with using Edmodo and its perceived usefulness and ease of use. Perceived Usefulness: contribution to academic results and future pro professional communication with teachers and peers and access to resources. Ease of Use: ease of management activities, solution and utility concerns.
Recollection of information	Information for the study was collected by a made up of three blocks of information questionnaire. For the first block for which was used directly to university records. For two three blocks information was collected through questionnaire addressed online.
Information analysis Methodology	Using linear regression purposeful selection of variables associated factors were evaluated user satisfaction according to the proposed model TAM.

III. RESULTS

In technology and in different environments, it has been proved that much of the appropriation of a tool comes from the perception of satisfaction experienced by the user and that is why in the process of teaching and learning any technological intervention or change in methodology is susceptible of such reviews, to find through this level of satisfaction estimation the best practices and lessons learned.

For the purposes of assessment of the experience of users who formed part of the intervention group, a questionnaire for a total of 91 participants was developed, in terms of general and specific satisfaction (communication and management of activities), about the perception of

the utility of EDMODO implemented in short term (academic results and deepening of specific knowledge of Management) and long term (contribution to vocational training and job skills 2020).

As shown in Figure 1, the experience with Edmodo can be described as positive (T2B = 82%), especially for women and for those students classified in the group of high academic achievement (average equal or superior to the group), coincident with reported by Hung & Cheng, 2013 cited in Cabero & Marin 2013).

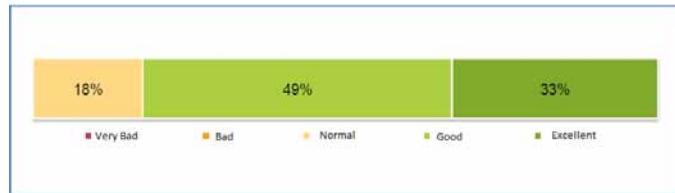


Figure 1. Marks obtained in the experience with Edmodo

On the positive side, participants felt that the tool facilitates the management of activities (T2B = 91%) and the track of their qualifications (T2B = 89%). Likewise, the ability to communicate with the teacher (T2B = 85%), ease of sharing resources in different formats (T2B = 98%) and access to interesting information on the subject (T2B = 95%) were also seen. Also with positive ratings, but not as strong, it is the overall ease of use (T2B = 74%) and the contribution to the deepening of knowledge on topics covered in the course (T2B = 76%), projecting the tool slightly positive for resolving concerns (T2B: 67%).

The positive perception towards achieving a better level of knowledge thanks to the group using EDMODO.

On the negative, the use of EDMODO is related with a low ability to communicate with peers (T2B = 55%), low contribution to the academic results (T2B = 54%) and very little contribution to vocational training (T2B = 22%).

It is perceived that EDMODO generates low ability to communicate with peers, but in the process of self-evaluation only 41% considered an active participation in the tool and in conjunction with the results in academic achievement and vocational training, it was evidenced that designated by Berrio & Rojas (2014) against the unwillingness of students to take responsibility for their own learning and performance.

The overall usability (T2B = 74%) could be affected by the work methodology. Despite this, in the case of students of Business Management I, it was found that the fact of leaving the doors open to discovery EDMODO to acquire driving skills, in some cases became a barrier to progress within the process itself.

This experience was applied to a group of students where the contribution of ICT is expected to be orientated in getting a better learning by the student and the development of some skills required for future professional work, for this reason and hand with job skills 2020 postulated by the Institute for the Future (Davies, et al., 2011), the perception of the contribution of the experience of using EDMODO was evaluated considering three skills, knowledge about new media, virtual collaboration and management of cognitive load.

The evaluation of the contribution of EDMODO to improve these skills, is very positive for rating the ability to learn different ways of working (T2B = 86%), it is also positive, but less, for Virtual Collaboration (T2B = 73%) and slightly less for the ability to know where to look for what you want to find and what to do with what is found with 63% positive mentions.

UX associations with the variables studied were reviewed for Gen Y, perceived usefulness and ease of use, finding that the love of learning from different sources is positively correlated with the grade that the

user makes regarding their experience using Edmodo, a situation that may shows that curious students exploit better the diversification of opportunities they find on the road and, therefore, they appropriate them more successfully.

Related to the mechanisms and strategies of participation developed (logos) is observed a weak correlation between satisfaction and motivation that comes when getting them, a situation that may be due to occult practice by which they were delivered or not to take into account in the rating (qualification).

The TAM model maintains that the ease of use and the perceived usefulness are related to the intended use or, in this case, with the UX. When reviewing whether these associations are presented in this study, this perspective is reaffirmed as it is found that the rating of UX is positively associated with the ease of use in general, the facility to track their activities and the knowledge their progress in terms of qualifications as well as with the perceived usefulness of knowledge expressed in terms of business and the contribution to their academic performance and professional development and similarly to 2020 job skills such as Virtual Collaboration and Management of cognitive load. There is no association with the new knowledge in media and this may be related to the type of activities undertaken that generally did not required the exploration of tools but EDMODO.

As the TAM model proposes that the perception of usefulness and usability are definitive in the appropriation of a specific form of work, it is not possible to ignore that prior experience and the typical processes of resistance to change can also affect the intention of use, for this reason and using regression analysis as a technique to find out the factors associated with UX which are also related to student achievement.

The academic performance of students in the study group is related to variables such as academic confidence, age, sex, origin, Overall Rating EDMODO, NSE, Perception Rating Impact on significance levels and are indicated in Table 1.

Variable	P	sig20	sig10	sig5	sig1
Academic confidence	0.00%	*	*	*	*
Age	0.64%	*	*	*	*
Gender	1.68%	*	*	*	*
Origin	3.19%	*	*	*	*
UX Rate	7.98%	*	*	*	*
Socioeconomic level	9.28%	*	*	*	*
Perception Impact Rating	18.51%	*	*	*	*

Table 1. Significant variables

Once forward the variables review process, the final model is obtained (R2 = 0.43), ie that 43% of qualifications in the grade Management I is mainly explained through the variables Academic Trust, Gender (Female) and UX (Categories 4 and 5).

In this model the variables Origin (Capital) and Perceived Impact Rating (categories 1-5) are conserved as the confounding variables of the significant variables and the overall qualification in UX, respectively.

The previous academic performance remains being the key variable in predicting the results of the students (b = 0.76), and the female continues unabated and, related to UX variables, the positive perception that the students had to EDMODO contributes about 1.5 tenths in final rating, in contrast to the consideration that the tool did not impact positively on their score. This perception subtracts more than 5/10 to academic performance (about 4/10 when the impression was positive).

Building this model (Table 2) confirms its importance in the perception of utility (impact on the rating) and usability (UX overall rating), allowing the advance assessment the success of the appropriation of the use of Web 2.0 for academic purposes to find

alternatives which foster their proper implementation, in order to maximize results in the students in the short-term to adapt educational innovation projects making them more effective.

Variable	P	B	Standard error	T	Confidence interval 95%
Academic confidence	0.0000	0.76	0.14	5.38	0.48 1.04
UX-4 score	0.1230	0.16	0.10	1.56	-0.04 0.37
UX-5 score	0.2180	0.15	0.12	1.24	-0.09 0.39
Female	0.0150	0.19	0.08	2.49	0.04 0.34
Hometown	0.0500	0.15	0.08	1.99	0.00 0.30
Impact perception Mark-1	0.1760	-0.56	0.41	-1.37	-1.38 0.26
Impact perception Mark-2	0.1650	-0.53	0.38	-1.40	-1.28 0.22
Impact perception Mark-3	0.1160	-0.53	0.33	-1.59	-1.20 0.13
Impact perception Mark-4	0.2480	-0.39	0.33	-1.16	-1.06 0.28
Impact perception Mark-5	0.1890	-0.46	0.35	-1.33	-1.16 0.23

Table 2. The model

IV. CONCLUSIONS

The use of EDMODO in the learning experience is seen as positive ($T2B = 82$), identifying facilitators and impeding factors in the appropriation process. The main facilitators are given in terms of communication and organization (asynchronous and easy communication with the teacher and the group in general) and in terms of organization, the tool remembers and facilitates the delivery of activities. Considering constructivist concepts free exploration was used to acquire significant learning that can be replicated to a future in adapting to other tools, additional to the management tool itself, and that this situation (knowledge in new media) became a main obstacle that prevented exploiting the potential of the tool by the typical resistance to change.

As proposed in the model TAM (Technology Acceptance Model), the variables of perceived usefulness and ease of use were found to be related to the appropriation of the tool. In relation to Edmodo users it was seen a slight but positive association ($b = 0.15$) between the score and results UX, where students with better academic results qualify more positively their experience in comparison with those with below average academic results. The contribution to academic results is weakly perceived ($T2B = 53\%$) and negatively related to academic achievement (decrease of more than four tenths in qualifying the subject).

It forms part of the process of comprehensive training to prepare students for employment in the near future, in an environment characterized by change and connectivity. In this context, participants felt that the application of EDMODO helps to develop competencies such as the ability 2020 media ($T2B 85\%$), virtual collaboration ($T2B = 73\%$) and management of cognitive load ($T2B 63\%$), with positive associations with UX for the last two.

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