

Measuring the Use of Twitter in Education

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Abstract

The educational environment is affected by the transformations of new technologies, virtual communities, and social networks, and especially by the creation of social knowledge. In this frame, students show a greater tendency to use ICT tools, inside and outside academic settings, a fact that is transforming their process and the ways of learning. To cope with this situation, it is crucial to use educational strategies centred on active methodologies, the use of new technologies, the continuous participation of students, and the use of co-learning processes that focus on the characteristics of new students. However, research about the advantages of these new methodologies of teaching and learning, and especially about their performance are still scarce.

This paper concentrates and analyzes specifically on the use of Twitter as an important tool for educational purposes. Twitter, like other social media, is broadly used by students. However, and in spite of its possibilities, its use for educational purposes is reduced. In order to fill this gap, this work studies the main potentialities of Twitter to provide different applications and services for students.

In addition, and after a deep research in the literature, the paper creates a rubric or questionnaire to measure the opinion of students about the capabilities and possibilities of twitter for educational purposes. The questionnaire is tested with a sample of 105 students at the university level. Results and discussion of the results, and recommendations for future research and applications are also provided.

Keywords: Twitter, education, innovation, rubric

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Introduction

The nowadays educational environment requires the application and transformation of new teaching and learning methods and tools (Garrigós et al., 2015). The greater tendency of students to use ICT tools inside and outside academic settings (Venkatesh, et al 2014) demand of new educational strategies centered on new active methodologies, where the participation of students and the use of co-learning processes are crucial. Moreover, the new methods have to consider the use of social networks as an essential mechanism for learning and the creation of knowledge.

There is scarce research about these new methods. In order to fill these gaps, this paper analyzes the crucial role of social media in the improvement of teaching mechanism. Moreover, the paper concentrates on the analysis of Twitter as an important tool to improve education and learning. In addition, the paper creates and evaluates a rubric about the use of twitter, and describes a methodology for using twitter for the improvement and evaluation of marketing and management assignments in courses for engineers at a university level.

Twitter

Consider as one of the main social networks nowadays, Twitter is a micro blogging service, created in California in March 2006. Described as "the SMS of the Internet" (Garrigós et al., 2016a,b), this social network has become one of the top 10 most visited websites on the Internet (Maduewes, 2013). Nowadays it has more than 320 million active users, which means, users that launch at least one tweet each month; it supports more than 35 languages (Twitter, 2016), several alphabets and allows automatic translation.

Due to their popularity, the use of social networks, and particularly Twitter, in education, is a reality that cannot be hidden and avoided. Following Garrigós (2016a) Twitter permits users to send short text messages, with a maximum of 140 characters, called tweets. Users can subscribe to the tweets of other users, by following them as "followers". By default, messages are public, however they can also be spread privately to certain followers. As opposed to other social networks, communication is multiple and simultaneous one-to-many. This fact, in our opinion, facilitates its suitability for teaching, as one can virtualize the connection "one-to-many" that the teacher establishes with his students in the classroom. Moreover microblogging can be used for one-way exchanges, as an official account, to keep the community informed of events, deadlines, or policy changes. However, Twitter can also provide "many to many" communication, allowing not only not the student-teacher communication or link, but also the appearance of groups with their own entity as administrators. Other interest groups can be formed, permitting communication through the use of a hashtag (string of characters that consists of one or more concatenated words preceded by the hash character (#) used to indicate a subject on which a conversation turns) or interactions between accounts.

Garrigos et al (2016a, b), analyze some of the advantages and disadvantages of twitter for learning education. Reconsidering the most important of them, we could synthesize them in the following list:

1. It is easy to use.
2. It is cross-platform multi-device. It is accessible, as it is available on almost any platform and any device that allows connection to the Internet (García et al, 2015). Specially, it permits Multy-device access (eg. Smartphones), as it is always in the pocket of students
3. It is not invasive, the tool opens when you want. Moreover, it not pursues messages to the recipient.
4. It facilitates access to information, and search for hashtags. It facilitates the search of information (Miguel and Fernández, 2013), a fact that facilitates finding the most relevant information, and organize it (García et al, 2015). The use of Twitter for education has many advantages, among them we can be stress the easy of using list or hashtags (users tag the publications or events in order to group groups, themes..., allowing the possibility of spreading the opinions of people easily). Searches can be made by words, hashtags, or related tweets, which allows the localization of people or interesting, quick, instantaneous information related to the matters covered. In addition, this facilitates making debates from a hashtag.
5. It facilitates the exchange of information with colleagues or peers. It make easy the sharing of relevant information quickly (Miguel and Fernández, 2013, Carpenter, 2014), and the sharing of questions, ideas or tasks (Dunlap and Lownthal, 2009). For instance, Evans (2014) found positive correlation between the amount of Twitter usage and the sharing of information.
6. Twitter is a tool that student recognize as their own. As it is a popular, novel tool, it is usually well received among students. (Garcia et al, 2015). We cannot forget that it is a highly recognizable technology of social media (Cassidy et al., 2014), and, a tool they recognize as their own (Noguera, 2015)
7. Twitter facilitates reading, and it is agile. It produces agile reading, derived from its brevity (140 characters) (García et al, 2015)
8. It facilitates the synthesis of relevant information quickly (Miguel and Fernández, 2013). Moreover, the articles are transformed by the social network, which summarizes and make them attractive for users.
9. Twitter allows for anonymity (García et al., 2015)
10. Twitter foster sharing, conversation and relationship (Falahah & Rosmala, 2012). This platform facilitates connectedness and resource sharing (Carpenter, 2014), participation (Noguera, 2015), and communication (García et al, 2015). It promotes direct communication between users, a fact that facilitates the rapprochement between users (Miguel and Fernández, 2013). In addition, Welch and Bonnan-White (2012) state that Twitter increases student engagement in the university classroom. The benefit from engagement is especially important in the case of online courses, as its use permits sharing information (Dunlap and Lowenthal, 2009), and leads to greater cohesion within the group (Guzmán et al., 2012). Moreover, according to Guzmán et al., (2012) it helps prevent drops in attention throughout a lecture, and increases the receptivity of the students, by encouraging active participation every so often
11. Twitter enhance the ability of writing by having to condense an idea into 140 characters. The fact of expressing ideas or opinions on a subject in only 140 characters helps students in their writing skills. Hence it focuses the attention of students, and the search for objectives connected with the study plan without being tied or restricted to it (Grosseck and Holotescu, 2008), and it

- promotes learning to write for a particular audience (Dunlap and Lowenthal, 2009).
12. Twitter promotes collaboration and networking (Noguera, 2015). It facilitates interaction and collaborative work (García et al., 2015; Grosseck and Holotescu, 2008), and collaborative learning (Carpenter, 2014).
 13. Twitter improves the ability to identify with someone (empathy), or even the empathy with the subject (Sullivan, 2012)
 14. Twitter improves the practice of thinking and reflecting on learning, being a viable platform for metacognition (Grosseck and Holotescu, 2008)
 15. Twitter improves motivation and academic performance. As a tool they recognize as their own, it increases motivation, academic performance and participation (Noguera, 2015). Moreover, it promotes the motivation of the students, as it provides elements of enjoyment and social presence (Noguera, 2015)
 16. Twitter improves the working environment with peers. It improves working atmosphere (Miguel and Fernández, 2013). In addition, Evans (2014) also founded a correlation between the amount of twitter usage and student engagement in university-associated activities such as organizing their social lives.
 17. With the use of Twitter one is more open about his feelings. By using Twitter, students can be more open about their feelings and shortcomings (Junco et al., 2011). It enhances the participation in the classroom especially for those more introverted students, for whom it is difficult to express their views aloud (Guzmán et al., 2012). Hence, it means that communication between students is uninhibited and they can speak to the teacher directly (Carpenter, 2014). In general, it facilitates inclusion and equity (Noguera, 2015)
 18. Twitter facilitates peer tutoring and / or collaborative learning. It facilitates collaborative work between students (García et al., 2015; Grosseck and Holotescu, 2008). In addition, it promotes peer tutoring (Dunlap and Lowenthal, 2009), as it allows sharing images, videos, documents, presentations, etc. with others.
 19. Twitter can allow maintaining ongoing relationships after the course ends. Hence, student and faculty use of Twitter is not bound by the structure of the lesson or the timing of a semester, permitting continuous advice to students academically and professionally (Dunlap and Lowenthal, 2009; Moody, 2010)
 20. Twitter facilitates interaction and also work in collaboration between students and teachers. First of all it is interactive (Dunlap and Lowenthal, 2009; Thoms and Eryilmaz, 2015), showing other publications, which the user can intervene in, share or save by marking them as favorites (García et al., 2015). It facilitates interaction between students (García et al., 2015; Grosseck and Holotescu, 2008), as pointed before, but it also allows connection with students from other schools and countries. It also promotes collaboration between students and teacher as it also allow the dissemination of publications and teaching materials (Grosseck and Holotescu, 2008), and as it helps to enhance the sharing of resource material research and task assignment, for announcements, to negotiate rescheduling class etc. In addition, it also helps teachers (Carpenter and Krutka, 2014), through collaboration between diverse schools and countries (Grosseck and Holotescu, 2008), or even direct communication with parents, who can follow the activities of their children.

- For instance according to Carpenter and Krutka (2014), Twitter can allow educators to learn with and from each other in an apparently meaningful way.
21. Twitter allows to extend the work outside the classroom, from the questions, reminders of deadlines and others. It enables students to learn outside the classroom (Venkatesh et al., 2014), It overcomes the spatial and temporal boundaries of the classroom (García-Suarez et al., 2015), allowing work to extend outside the classroom, from questions posed, subsequent tasks with reminders of deadlines, and even raise issues of future classes or creating virtual meetings, (Noguera, 2015). Moreover, Twitter communications improve students and faculty engagement in the learning process in ways that transcended traditional classroom activities (Junco et al., 2011). The improvement on students perceptions, the ease of use, the usability and overall experience helps students to learn outside the classroom
 22. Twitter allows acquire practical skills in a more informal way (Dunlap and Lowenthal, 2009; Grosseck and Holotescu, 2008).
 23. It promotes students autonomous education. Or more broadly the self-directed, independent, and autonomous education (Noguera, 2015)
 24. It helps to reduce the number of students who leave a course. Specially, facts such as the changes in the learning environment and the higher engagement and cohesion within the group can lead to a reduction of the number of students who leave the course (Guzmán et al., 2012)
 25. Twitter contributes to the personalization of learning (Noguera, 2015), each at its own pace. This is due essentially to the attributes of the tool. In addition It also allows easy organization of time (Dunlap and Lowenthal, 2009), and organization through hashtags and publication dates (García et al., 2015).
 26. It's easy to follow influencers, and access them with or without feedback. It makes it easy to follow people who contribute on matters that are being studied. There is access to professionals, with or without feedback (Dunlap and Lowenthal, 2009; Guzman et al., 2012)
 27. The use of trending topics facilitates to find information in real time. It is characterized because of its Immediacy (Dunlap and Lowenthal, 2009; Tess, 2013). In this sense it is dynamic, as the information is in real time (Cassidy et al., 2014; Garcia, 201). It makes easy the access to the so-called "Trending topics", or the most relevant themes or spoken topics at each moment, which can be filtered by locations.
 28. Facilitates access to information within an institution (Noguera, 2015), a fact that is promoted because of the previous commented immediacy
 29. It's easy to comment and read about conferences where one cannot attend. In addition, for conference attendees, Twitter can provide a simple way to share thoughts with others at the event about specific sessions and activities, and with those who cannot attend, providing live coverage of events (Grosseck and Holotescu, 2008). It can help in brainstorming (Barreto and Jimenez, 2010) or to disseminate conference updates to non-attendees (Garrigos et al., 2016a,b). Moreover, it offers the possibility of virtual conferences through streaming (although this is an external functionality), with the possibilities of chatting.
 30. The ease of using images, videos and links and integrated tools such as surveys, improves locating information. It has a high functionality, as it allows embedding pictures, videos and links (Garcia et al., 2015), and the integrated use of tools and video presentations (Moody, 2010). Moreover, as commented previously, the so-called "Trending topics" make easy locating information.

31. Sharing things to a small community provides you with a sense of belonging to the same. As commented previously, Twitter increases student engagement, but also the sense of belonging (Guzmán et al., 2012).
32. Students can use tweets in order to send questions and observations to the group during the activities in the classroom.
33. Your behavior is viral; when re-tweeting, or spreading news, one becomes information issuer. It is viral, as contributors can re-tweet a tweet from another user, or spread photos, news etc. Students become small emitters of information (Moody, 2010), as they can share the things they can find (Dunlap and Lowenthal, 2009), for instance using Twitter as a journal club to share related papers or information (Barreto and Jimenez, 2010)
34. Apart from improving the working environment in general (Miguel and Fernández, 2013), as pointed before, specifically it has a positive impact on creating a collaborative working atmosphere (Rinaldo et al., 2011)
35. It helps to create a sense of community, and to generate confidence and security. Social media, such as Facebook and Twitter, are recognized for enabling students to build communities (Venkatesh et al., 2014). Moreover Twitter is a valued tool to create or build a sense of community and generate trust and confidence (Grosseck and Holotescu, 2008; Moody, 2010; Thoms and Eryilmaz, 2015, Garrigos et al., 2016 a,b)
36. Twitter improves informal learning. Twitter helps the informal autonomous learning of students, who can discover resources and tools than can be applied effectively in their courses (Dunlap and Lowenthal, 2009; Grosseck and Holotescu, 2008)
37. It increases learning in general (Thoms and Eryilmaz, 2015). It fosters student learning (García et al., 2015). In addition, and specifically, it facilitates lifelong learning and learner mobility (Noguera, 2015).
38. Twitter redefines the roles of teachers and students, opening the door to teaching student-centered methods (Noguera, 2015). In addition, Grosseck and Holotescu (2008) highlight that the act of participation in education and the interchange of the best practices used by lecturers changes the dynamics of the classroom
39. It enhances dialogue (Moody, 2010), and promotes understanding of materials (Garcia et al., 2015). It promotes teaching presence, or the ability of the teachers to support and enhance social and cognitive presence through instructional management, building understanding, and direct instruction, as Twitter helps lecturers to engage in interactions with students (Dunlap and Lowenthal, 2009). Moreover, it facilitates centralizing the activities and sources of information and the coordination of the work, allowing the monitoring of the main points and following activities (Miguel and Fernández, 2013).
40. Twitter facilitates changes in cognitive processes and learning patterns (Noguera, 2015). In addition, when used correctly it instigates complex cognitive processes (Venkatesh et al., 2014).

These items could be synthesized in the rubric showed in table 1

Table 1: Rubric

Number	Question
1	It is easy to use
2	It is cross-platform and multi device
3	It is not invasive, the tool opens when you want
4	Facilitates access to information, and search for hashtags
5	It facilitates the exchange of information with colleagues
6	Do you think twitter ... is a tool that you recognize as your own ?
7	Do you think twitter ... facilitates reading, it is agile?
8	Do you think twitter... allows the synthesis of relevant information quickly?
9	Do you think twitter ... allows anonymous?
10	Do you think Twitter... foster sharing, conversation and relationship?
11	Twitter enhance the ability of writing by having to condense an idea into 140 characters
12	Twitter promotes collaboration and networking
13	Twitter improves the ability to identify with someone (empathy)
14	Twitter improves the practice of thinking and reflecting on learning (metacognition)
15	Twitter improves motivation and academic performance
16	Twitter improves the working environment with your peers
17	With the use of Twitter, you are more open about your feelings
18	Twitter facilitates peer tutoring and / or collaborative learning
19	Do you think that Twitter will allow maintaining ongoing relationships after the course ends?
20	Twitter facilitates interaction and also work in collaboration between students and teachers
21	Twitter allows to extend the work outside the classroom, from the questions, reminders of deadlines and others
22	Twitter allows acquire practical skills in a more informal way
23	It promotes students autonomous education
24	It helps to reduce the number of students who leave a course
25	Twitter contributes to the personalization of learning, each at its own pace
26	It's easy to follow influencers, and access them with or without feedback
27	The use of "trending topics" facilitates to find information in real time.
28	Facilitates access to information within an institution
29	It's easy to comment and read about conferences where you cannot attend
30	The ease of using images, videos and links and integrated tools such as surveys, improves locating information.
31	Sharing things to a small community provides you with a sense of belonging to the same
32	Students can use tweets in order to send questions and observations to the group during the activities in the classroom
33	Your behavior is viral; when re-tweeting, or spreading news, you

	become information issuer
34	It has a positive impact on creating a collaborative working atmosphere
35	It helps to create a sense of community, and to generate confidence and security
36	Twitter improves informal learning
37	It increases learning in general
38	Twitter redefines the roles of teachers and students
39	It enhances dialogue, and promotes understanding of materials
40	Twitter facilitates changes in cognitive processes and learning patterns

Empirical Study: Evaluation of Twitter

Focusing on our particular case, Twitter was employed for experimental teaching purposes in the FBO (Foundations of Business Organizations), and D&P (Deontology and Professionamism) courses, in the School of Computer Engineering at the Polytechnic University of Valencia. In order to do evaluate the advantages of the use of Twitter, we created a virtual questionnaire (following the rubric and items previously analyzed). This experiment was carried out during the 2015-2016 course, and we got a final sample of 105 valid questionnaires. We asked for the perception of students about the diverse advantages of Twitter, using a 5 points likert scale, with showing 5 the most favorable opinion.

Results

The main results of this questionnaire are shown in table 2. Figure 1 shows the average of the opinions of the students for the 40 items of our rubric. A special feature of note is that students on the one hand were not only knowledgeable about the technology, but they were also direct users of the tool, as they had used it previously with full competence.

Table 2: Main results of the questionnaire to students, using the rubric provided

Number of question	Average (mean)	Standard deviation	1 quartile	2quartil (median)	3 quartil
1	4.08	1.07	3.5	4	5
2	4.29	0.95	4	5	5
3	3.71	1.19	3	4	5
4	3.76	1.13	3	4	5
5	3.32	1.24	2	3	4
6	3.24	1.26	2	3	4
7	3.62	1.18	3	4	4
8	3.59	1.26	3	4	4.75
9	2.51	1.3	1	2	3
10	3.40	1.18	3	3	4
11	3.51	1.20	3	4	4
12	3.32	1.06	3	3	4
13	3.29	1.13	3	3	4
14	3.18	1.15	2	3	4
15	2.87	1.25	2	3	4

16	2.96	1.16	2	3	4
17	2.92	1.22	2	3	4
18	3.10	1.15	2	3	4
19	3.03	1.25	2	3	4
20	3.39	1.14	2	4	4
21	3.43	1.18	3	4	4
22	3.40	1.18	3	3	4
23	3.39	1.22	2.25	3	4
24	2.63	1.32	1	2	3
25	3.04	1.18	2	3	4
26	3.98	1.09	3	4	5
27	3.89	1.17	3	4	4.75
28	3.56	1.09	3	4	4
29	4	1.08	3	4	4
30	4.05	1.11	3	4	5
31	3.62	1.12	3	3.5	4
32	3.36	1.27	2	3	4
33	3.76	1.21	3	4	4
34	3.33	1.14	2	3	4
35	3.39	1.10	2	3	4
36	3.68	1.23	3	3.5	4
37	3.47	1.17	2	3	4
38	3.54	1.21	2	3	4
39	3.50	1.09	3	3	4
40	3.59	1.14	3	3	4

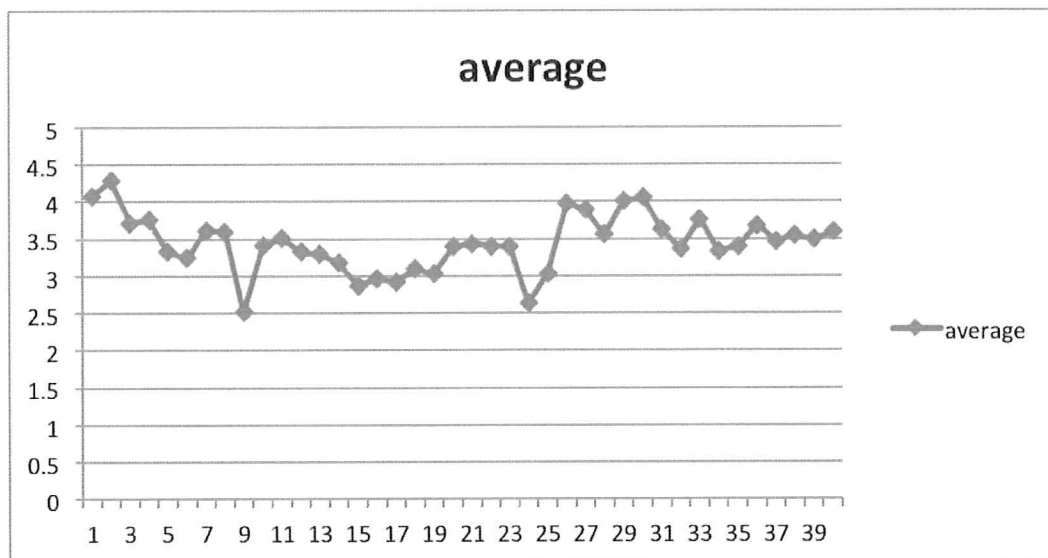


Figure 1: Average (mean) of the evaluation of items

According to the opinions of the students the question that receives more support is question 2” “It is cross-platform and multi device”. Apart from this, other questions supported, with an average near to 4 are questions 1: “It is easy to use”, question 26: “It’s easy to follow influencers, and access them with or without feedback”, 27: “The use of “trending topics” facilitates to find information in real time”, 29: “It’s easy to

comment and read about conferences where you cannot attend” and 30: “The ease of using images, videos and links and integrated tools such as surveys, improves locating information”.

Opposite, the ones that have lower support with an average of 2.5 are question 9: “Do you think twitter ... allows anonymous?”, and 24: “It helps to reduce the number of students who leave a course”.

However we the evaluations of students are positive in all the cases, due that most of the items get an average of more than 3 and there is no item with a punctuation lower than 2.5.

Discussion and Conclusion

The literature has researched previously about Twitter usage, the context in which Twitter is used, the impact Twitter usage has on engagement of students, or even the impact of its use on the creation and maintenance of university students' cognitive social capital (Petersen and Johnston, 2015).

However, although there are some exceptions that have used it to analyze some outcomes (i.e Dunlap and Lowenthal, 2009; Guzmán et al., 2012; Clark, 2014; Pieterse and Peled, 2014; Thoms and Eryilmaz, 2015) few studies have analyzed the impact of the use of Twitter on students behavior and perceptions. In order to cope with this situation, our paper, has concentrated in developed theoretical research about the use of Twitter and the performance of students at university level. In addition, the paper has created a rubric about the benefits and consequences of the use of Twitter in the classroom. Among the theoretical advantages of Twitter analyzed, we have stress questions such as its accessibility, immediacy, interactivity, its use as a reminder about activities, asking questions, facilitating participation, discussions and provision or information.... Moreover the paper has conducted an evaluation of this rubric in the D&P and FBO courses in the School of Computer Engineering at the Polytechnic University of Valencia, with a participation of 105 final opinions by students. Specifically we analyzed the incidence of the use of Twitter in the perceptions of students about the advantages and uses of Twitter, in an experiment with optional participation by students.

The results show that the most important advantages of twitter, are related with being a cross platform and multi-device, that it is easy to use, follow and access influences, the advantages to find information in real time, the easy use of images videos and links that facilitate locating information, or the facilities to comment and read new information. However, the anonymity of the platform and its influence to reduce the number of students who leave a course are the items that have lower support. Nevertheless, all the advantages considered have a support of 3 or more up to 5 in a likert scale, and no average is lower than 2.5.

It is difficult to compare our results with the results of other similar works. This fact is because we did not find experiments that satisfy all the characteristics of our case: use of Twitter as classroom support tool. We can also add that there are few studies that have analyzed the impact of the use of Twitter on student perceptions. The fact is that Twitter is usually a "silent companion" in the classroom (Dunlap and Lowenthal,

2009; Clark,2014), just for classroom use, or to propose work outside (Guzmán et al., 2012). In some cases it has been used both in a classroom subject and in a blended learning format (Thoms and Eryilmaz, 2015), something similar but not similar enough to our case for comparison. Far from our case is the use of Twitter for professional guidance, social support, personal empowering or broadly e-mentoring novice teachers in online workshops (Pieterse and Peled, 2014).

Nevertheless, our results are similar to other previous studies, which use Twitter or similar tools for learning, due that our study support the good perceptions of the use of Twitter by students, and its positive impact in diverse questions related to the improvement of learning. Actually, the literature about the incidence of Twitter on the performance of students is still more reduced, although there are some examples of the impact of Twitter on students learning (Buettner, 2013; Dhir et al., 2013), or on college students grade points (Junco et al 2011; Junco et al. 2013). Hence, Maguth et al (2010) showed that students using technology to access and analyze information, communicate and showcase learning, were successful in their pursuits and improved the research production and presentation of results. Garrigos et al (2015) analyzed the use of Facebook for the production and evaluation of assignments and showed diverse impacts on the improvement of learning. For instance, they showed an improvement of more than 20% in the average marks and quality of these assignments, and provided other diverse impacts on the improvement of the learning process of students. More specifically, Junco et al (2011), and Junco et al (2013) in experimental settings, using ANOVA, showed that Twitter significantly improves college student grades points, apart from class participation and engagement in learning processes in ways that transcend classroom activities. However, in the second study, Junco et al (2013) did not find significant differences in the effects of using Twitter to collaborate within the class. In the same way Buettner (2013) and Dhir et al., (2013) also finds some positive relationships between Twitter usage and learning outcomes. Our study confirms these results, by showing the relevant incidence of the use of Twitter in classroom activities, for improving the learning and success of students on a course.

We are conscious that the use of Twitter has also some limitations, such as it is explained by Garrigós et al (2016a,b), and that our paper has some limitations, which could open new lines of research, as it is an exploratory study. Hence a more deep analysis about the uses, advantages and disadvantages of Twitter for educational purposes is necessary. It could be also interesting to analyze some of these uses in depth, or using bigger samples or samples in diverse geographical contests, or a deep comparison with other platforms should be explored. For instance we detected in our conversations to students the influence of other platforms that are more based on images, such as Youtube.

These facts, apart from its practical point, obviously open new and important areas of research that are often avoided in education. Anyway, our work opens new and important areas of research that are often avoided in education, and specifically research to new empirical works. In addition, our results have some practical implications. Hence, we posit that researchers, educators and practitioners should show more interest in the use of Twitter within educational contexts. Following Garrigos et al (2016a,b,) we consider that educators should develop new approaches and strategies to help students use their networking behaviour to enhance their learning and development. Nowadays students, as digital natives, are very familiar

with the use of social networks, and this is a fact that we cannot avoid, although, as Garcia et al (2015) stresses, the final success will depend on the clear perception by students of the objective of using this tool by overcoming the simple instrumental vision of Twitter. Hence, we think that it is crucial that these kinds of initiatives be spread in the university context, starting with educators who must enhance the motivation of students (Garrigós et al., 2016a,b) and some elements of enjoyment and social presence from Twitter (Noguera, 2015). Moreover, innovation is more likely to occur in organizations that emphasize collaboration and teamwork, so enhancement of motivation and collaborative work are some of the key points of its use according to our perspective. Furthermore, previous studies show that Twitter can enhance innovation and creativity (Noguera, 2015). However as pointed out by Lin et al. (2013) and Garrigos et al (2016a,b) as a classroom tool Twitter requires careful course design.

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