

Twitter as a Learning Community in Higher Education

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ABSTRACT

Considering the potential and popularity of social media it is important to inquire into its use in learning. In this study the implementation of the activity carried out in Twitter with higher education students was analysed. The research was conducted following a mixed methodology, based on virtual ethnography complemented by quantitative analysis of the tweets produced. A sample of 3,026 tweets was taken for such purpose. By way of conclusion, it is worth noting that student participation in the education process via Twitter progressively increases as their technical knowledge of this tool improves and they feel more motivated. Interaction and learning within a community is underpinned by gratifying experiences. Thus, the use of Twitter in the learning process of university students is feasible and perceived as a motivating experience by them. However, teachers play an essential role as dynamisers in the formal incorporation of Twitter in the teaching process, as well as in enhancing interaction between the participants.

Keywords

Twitter, Social networks, Networked learning, Higher education

Introduction

Didactic methods incorporating the new technologies are evolving slowly, which is why teachers should also update their skills to include the use of Information and Communication Technologies (ICT). Still, these resources are starting to contribute to the promotion of new forms of learning, forming part of a new emerging paradigm involving the construction and production of knowledge in cyberspace. Access to such knowledge makes vast quantities of information available to people, instantaneously or with a certain time delay, as well as facilitating contact with and knowledge of countless resources and communication platforms in any place at any time (Johnson, Smith, Willis, Levine, & Haywood, 2011; Kop, 2012). The Internet is a valuable resource in higher education, especially as a means of bridging long distances, thereby promoting the feedback process, a key component of learning. Moreover, it promotes the motivation and regulation of students in the training process.

Certain authors go even further (Fried, 2008; Hembrooke & Gay, 2003), indicating that ICTs have a negative impact on learning, as they disperse attention and promote the diversification of the type of tasks carried out on an autonomous basis. Although others researchers as Hsu and Ching (2012) indicated that the proliferation of Web 2.0 applications – especially the social media – among people and the ever greater use of mobile devices also contributes to broaden the possibilities of ubiquitous, collaborative learning. Still, the Internet as a source of learning continues to expand and gain ground, as it generates and facilitates communication and the acquisition of a great number and diversity of resources, and provides different ways to apply fundamental principles of learning in higher education (Gernsbacher, 2015). It is also worth noting that it gives rise to knowledge, though most of its content is not directly associated with regulated learning and the physical space of classrooms. On the Internet we can all be consumers, creators and disseminators at the same time. This is one of the premises of the EMIREC model (Cloutier, 1975): any emitter is a receiver and any receiver is also an emitter.

Kaplan and Haenlein (2010) define social media as the applications that are supported on the Internet and are based on the ideological and technological foundations of Web 2.0 and allow creating and interacting with contents generated by users by open and free means. In this sense, Khan (2013) outlined that they provide opportunities to users to develop relationships, communication, and collaboration (sharing contents). These social media integrate a large variety of emergent tools and technologies as wikis, blogs, and microblogging, content communities (YouTube, Pinterest, Slideshare), social nets (Twitter, Facebook, etc.), social tagging and folksonomies (Delicious, Addthis, Diigo), online games, collaborative platforms, and other web 2.0 platforms where users create, exchange, comment,

and value their own contents. Today no one questions the great educational potential of Web 2.0 tools, but their integration into learning contexts still has to take off, and one cannot as yet speak of widespread use.

Díaz-Gandasegui (2011) holds that social media are one of the main sources of leisure among the younger generations. This helps them to acquire the technical skills required for the use of the new technologies, although it does not ensure a widespread familiarisation or acquisition of skills within this group. It is also worth noting that, owing to the way in which they invade people's lives, social media can be seen either as a potential threat, or alternatively as a great opportunity that can be extended to different facets (Stoughton, Thompson, & Meade, 2015). However, the use of social media as a didactic tool is still at an incipient stage, despite the accessibility made possible by their application, as they are easy to use and available as an open resource on the Internet.

The social media constitute, together with the Internet, a phenomenon that has changed the way in which people and groups or communities communicate and socialise, the way in which interaction, collaboration and content creation take place. At present their repercussion is most notable. We can find a variety of examples of their application to everyday situations and in particular to extreme or exceptional circumstances (involving catastrophic weather events, tragedies caused by transport accidents, political issues, etc.), which have demonstrated the effectiveness of the use of the social media as a means of communication and mobilisation of thousands of individuals. In this respect, Dunn (2011) refers to the use of Twitter for coordination purposes in the mobilisation and organisation of massive demonstrations. From the foregoing it may be inferred that social media render a substantial service to citizens, providing a revolutionary and different way of communicating.

The idea that learning is a socio-cultural process requiring internal dialogue and motivated interaction with others (Johnson, 2009; Vygotsky, 1982) is fairly well established. This notion endorses Twitter as a useful tool in the construction of knowledge, particularly when the training process is carried out in a social manner from a connectivist point of view (Siemens, 2005). Dunlap and Lowenthal (2009) maintain that, for online learning to be really effective, it must facilitate the communicative and social process.

Undoubtedly, through the Twitter Social Network, whose use is freely promoted by users themselves, communication and interconnection are generated, and content is created and disseminated at tremendous speed and on a great scale, as one would expect of a mass medium. A study demonstrated that Twitter can be used to increase the learning process: the number of tweets is related to student's engagement in university, the learning tweeting is not influenced by interpersonal relationships between students and their tutor; and Twitter usage do not impact class attendance (Evans, 2014). By the way, Twitter was employed to improve writing, to develop reflection, and to expanding the class community (Kassens, 2014).

It is worth noting the application of the social media, specifically Twitter, to various institutional purposes such as, in the case of universities, the launching, promotion or diffusion of marketing initiatives; student recruitment; and communication with alumni besides its usefulness as a means of academic support (Palmer, 2013). So far, as we have already indicated, the application of social media to the academic context is considered incipient and there are few studies highlighting its interest for educational praxis. In fact, certain authors (Tess, 2013) contend that there are still grounds for considerable reticence, indicating that there are a few solid studies arguing in favour of the usefulness and efficacy of the social media in the university context; at the same time, other researchers praise their benefits based on experiences with different groups in higher education and state that when students are conditioned to use Twitter in the learning process and teachers become systematically involved in the implementation of activities, their participation and performance improves satisfactorily (Junco, Elavsky, & Heiberger, 2013). Therefore, the degree of interaction between teachers and students, together with a suitable design and regular performance of academic work in a network environment are key components for the attainment of successful results with the Twitter Social Network.

Added evidence in this respect is provided by the review carried out by other authors (Greenhow & Gleason, 2012; Veletsianos, 2012) based on the content of education and technology journals and some multidisciplinary publications, revealing that the research published to date on the use of Twitter in training contexts is quite scarce. Hence, it should be taken into account that there are still no solid methodological models for the didactic use of the Web 2.0 tools in general and Twitter in particular. Therefore, it is important to share the alternatives arising from research and any incipient experience, making use of good practices based on, at least, specific initiatives or case studies. Yakin and Tinmaz (2013) consider that such works can provide interesting results and conclusions on the

effective use of Twitter in education. Moreover, in order to avoid obsolescence, universities must incorporate innovative teaching-learning dynamics including the social media. It should also be taken into account that the values and mechanisms deriving from the digital culture (transparency, collaboration, accessibility, etc.) are held in ever greater esteem.

The main aim of this work is to promote interaction through practice and to broaden through research the understanding of the manifestations of a networked learning community, in this case in the socio-educational field, within the Twitter virtual environment. Based on an experience carried out with students using this network as a learning medium in a master's programme at Spain's "Universidad Nacional de Educación a Distancia" (UNED), the teachers and researchers were able to investigate its application in the educational process. Several foci of analysis were applied to Twitter in order to reveal the background of the dynamics originated within the learning context, establishing the following research questions:

- How is the performance of the academic activity realised with Twitter?
- In what ways does the student's production in Twitter change as the training process progresses?
- What is the students' response time in the Twitter-specific activities?
- How does interaction through retweets evolve?
- What are the main problems arising with the use of Twitter?

Context, didactic design and implementation in Twitter

As indicated earlier, the study focused on a master's programme at a Spanish university, entitled "Learning Communities in Social Networks," and the teacher-directed period was concentrated into six months. Since UNED is a distance learning university, communication via the Internet is crucial. Moreover, the content of this course is well suited to its being carried out via a Social Network. The main Twitter features are: the limited message length to 140 characters (tweet); the public character of the communication; the message impact is related to the readers' interest (followers); and its possible use as synchronous or as asynchronous means (Cohen & Duchan, 2012). These features make easier the learning of the tool, provide an easy access, and facilitate a free context for open communication. Thus, Twitter was selected, as its features were considered the most suitable to generate a learning community. However, the students' learning process was reinforced through other resources (weekly seminars via web conferences and chats, with theoretical and practical content related to the course); guidance provided by the teachers; clarification of queries, etc.

The activities scheduled featured innovative didactic components, which were being used for the first time. Their development was mainly aimed at creating a learning community in cyberspace with the students. Taking into account the constraints of the time schedule established by the University for the teaching of the course, with a short time span, it was decided to implement 5 waves of activities on Twitter, from Monday to Wednesday, at a rate of 7 per day (making up a total of 105 activities). Additionally, the course teachers conducted a web conference every Thursday to address any academic issues raised by the students. An interactive methodology mainly based on the Twitter Social Network was developed to enable the various practical activities of the course to be carried out.

The instructions given by the teachers in the web conferences for working in Twitter, regarding the identification and presentation of the activities, focused on including the hashtags for the course, for the discipline, and the activity number, before the title, and the activity description. Thus, students had to include at least three hashtags in their replies. The following example is given by way of an illustration: "#MasterNetworksUned #NLC #17 Threats | Indicates threats (obstacles external to the group) to the empowerment of a NLC of elderly people."

As required by the specific features of the Twitter Social Network, the activities were restricted to a maximum of 140 characters (including clean text and various web links) and to the possibilities offered by this tool via retweeting, user mentions, hashtags, favourites, direct and/or private messages, lists and possible searches.

The methodology is based on learning by doing and collaborative learning (Kalantzis & Cope, 2012; Ricoy, Feliz, & Sevillano, 2010). Students have to experience the learning community by participating in one doing significant activities implemented via Twitter that can be grouped into 12 categories: debate on the social media; adding new information via resources provided as a file attachment; completing information on an individual basis; using content analysis techniques such as SWOT Analysis (Strengths, Weaknesses, Opportunities, and Threats); creative linking of

ideas through the use of dedications; clever games with literary licences; conducting information searches on the web following specific instructions; requests for analytic changes in the titles of activities provided; collaborative creation of designs based on a specific proposal; questions on opinions about or experience with social media; assessment and review of contributions on tweets displayed; and word and letter games on curriculum design.

Research methodology

The present study was conducted following a mixed methodology, using a case study. Initially, within the framework of qualitative methodology, virtual ethnography techniques were used to address problems arising from the implementation of the experience based on Twitter. The use of virtual ethnography allows determination of the way in which people act and interact in a digital environment, giving meaning to social relations and the training process it transcends in cyberspace.

The research methodology used (qualitative-quantitative) allowed several different foci of analysis to extract additional and complementary results (Creswell, 2012): external (involving the identification of the problems and solutions offered to the different situations arising during the implementation of the activity with Twitter), internal (involving a description of the reactions, group atmosphere, etc.) and temporal (placing the previous two in their respective phases: initial, central and final) reflecting the changes that take place. In this manner it was possible to determine and understand the reality analysed from a threefold perspective: subjective, objective, and temporal (Clandinin & Connelly, 1995).

Participants

In accordance with the foregoing, the present study was carried out with a group of students of “Universidad Nacional de Educación a Distancia” (Madrid, Spain) enrolled in the course “Networked Learning Communities” forming part of a master’s programme offered by the university entitled: “Social Networks and Digital Learning.” A total of 39 people participated: 19 students in the course; the 2 course teachers, 2 other teachers from the master’s programme; and 16 external participants (those included in the last two groups joined freely). As regards gender, overall the participation was very balanced, with 20 male (51.28%) and 19 female participants (48.72%).

Of the 19 students registered in the course: 11 were teachers, 3 were journalists and 5 had other occupations (associated with IT, social work, scenography, economics and law). Their ages ranged between 21 and 50: 6 students between 21 and 30; 7 between 31 and 40; and 6 between 41 and 50.

Procedure

For the present study, the teachers combined their teaching and research activities. For such purpose, during the implementation of the experience they shared a digital diary running on “Google Drive” setting out their main achievements, incidents, problems or thoughts through the participant observation of Twitter activity and the weekly webconferences, and creating alternatives or solutions to address existing needs. The instruments for this ethnographic phase were:

- Hootsuite, to observe and store the Twitter activity.
- Learning platform, recording weekly webconferences.
- Group students’ final reports, with questions and reflecting activities about their experience.

In addition, through the cooperation among the teachers, supported by Internet tools (essentially HootSuite that allows keeping streams generated by activities hashtags), it was possible to monitor the students during the implementation, retrieve the tweets with the authors’ and timing data identifying them with the course hashtags (keeping them in txt format, separating fields by tabulators and pasting them in a spreadsheet file), and analyse the information obtained, initially, through the training activity carried out in Twitter, an incipient analysis was carried out fairly swiftly in order to provide, when required, diligent solutions. Finally, the students’ final report provided also relevant comments about their experience throughout the course. This was subsequently followed by a more in-depth analysis using “Analysis of Qualitative Data” (AQUAD) software. For this analysis, several files were

uploaded in the software: diary about observations of Twitter activities, each webconference recording, and each group report. The analysis methodology was based on content analysis procedures, using sentences as analysis units and coding categories related to the research questions (Yin, 2009; Zhang & Wildemuth, 2009). The two research questions focussed in this phase were: (1) How is the performance of the academic activity realised with Twitter? (2) What are the main problems arising with the use of Twitter?

According to Hine (2003), understanding how the interactions and the learning process take place requires integration between the members participating in a Social Network, such as Twitter, forming part of the community subject to analysis as outsiders and natives. This immersion into virtual communities with a training purpose allows, from a twofold perspective, as teachers and researchers, valuable data to be obtained for their in-depth study. Tierney (2012), among others, maintains that social media are an invaluable source of information subject to analysis.

Upon completion of the virtual training course, and hence of the tutored implementation of the learning process, the tweets were collected using Hootsuite to identify the course hashtags. These posts were pasted in a spreadsheet with these fields: tweet text, author's user, publication time, and indication of number of retweets. The software allows searches, counting, and calculating using operators as "find," "count," "average," etc. Each piece of data was located in a specific column to facilitate statistical options of analysis. Excel 2007 software was used to undertake different statistical analyses (frequency, percentage, mean and trend) on the nuclei under study.

Results

This section is divided into two subsections describing the main results of the qualitative and the quantitative analysis, respectively.

Qualitative results

The qualitative results presented here were obtained by monitoring the entire training process carried out via Twitter, together with a subsequent in-depth evaluation by means of content analysis. This made it possible to detect different problems, solutions, and identify the main achievements of the activity implemented via Twitter. Figure 1 below shows the results of the central foci of the analysis, with regard to the three phases identified. In the subsequent explanation, the evidence source and examples are indicated in brackets.

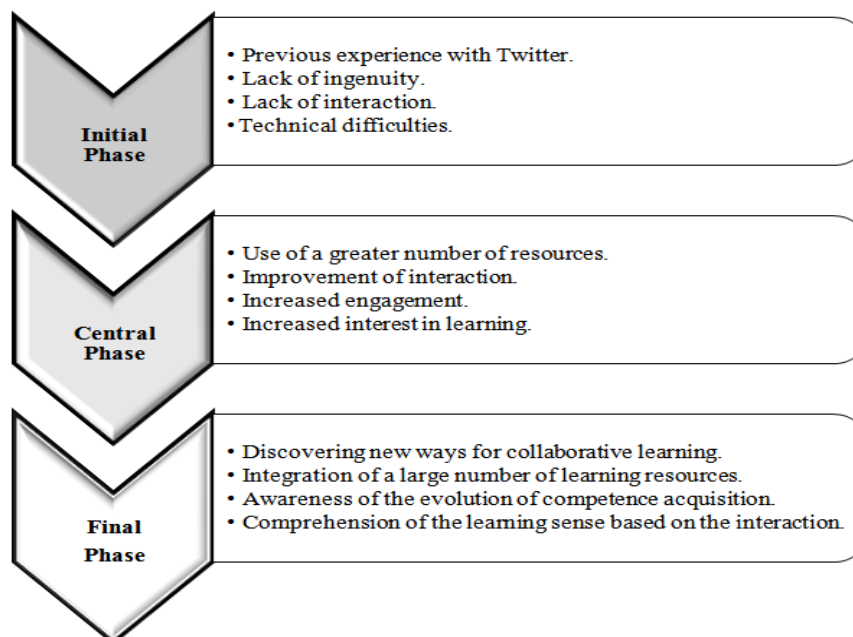


Figure 1. Overview of the work in Twitter in the respective phases

Initial phase

- Previous experience with Twitter: All the students stated they had some previous knowledge of Twitter use, although they showed scarce skills (Source: first and second webconference; students' questions about procedures; Twitter activity, e.g., all the student's accounts were created some time ago).
- Lack of ingenuity: This had the effect of limiting the students' initial response in the activities proposed, and as a result the preliminary work was rather poor, showing a considerable lack of creativity. In the students' first interventions in Twitter, we find simple replies, lacking in depth (Source: Twitter activity and final report, e.g., initially, students answered briefly to questions as in a questionnaire with single words; in addition, they recognised in their report that they did not take advantage of Twitter potentialities).
- Lack of interaction: The absence of interaction is reflected on the publication carried out by the participants with the tweets, characterised by very individual contributions, without involving themselves in other people's contributions or linking them to those of other group members. This was seen as a cause for concern by the teachers (Source: diary, e.g., the answers did not refer to over answers, they did not discuss, they did not use retweets and did not mark favourites), since there was no two-way communication other than replies directly addressed to the teacher. This was compounded by the virtual absence of retweets, as the evaluation of other interventions plays an important role in establishing a connection between the members of a learning community and strengthening its links. The teachers pointed out this weakness to the students and reinforced their motivation through various practical activities in an effort to reorient the direction of the messages and their production by the students.
- Technical difficulties: the main difficulties were centred on the use of hashtags and the abuse of the answer in their participation (Source: Twitter activity; e.g., some answers were not in the hashtag streams; the mention number of professor's accounts was quite high). Influenced by their mail experience, they use to use the answer option. However, in Twitter, that means a mention, introducing the user as a way to focus him in the communication. By the way, the hashtags are lost. To participate in this kind of community, you have to copy and past the hashtags and indicated previously and to use the mention, that means the answer, only when you want to focus a specific user or tweet. This points were clarified in the 2nd and 3rd webconference.

Central phase

- Use of a greater number of resources: As the activity progressed and the students improved their skills, the complexity of the practical activities proposed was gradually increased and the students were encouraged to use a greater number and variety of resources as documents, texts, blogs, posts in social media, presentations, games, videos, audios, images, photos, sites, etc. (Source: Twitter activity; e.g., occurrence of links to external sites).
- Improvement of interaction: the resource increase and the improvement of the tool management were found to have a positive impact on the level of interaction within the group, as evidenced by a better atmosphere and greater maturity in the community, leading to an improvement in the students' academic level and the quality of the communication produced (Source: Twitter activity and webconferences; e.g., students' comments in webconferences; lower number of professor's mentions).
- Increased engagement: Progressively, with the teachers' encouragement, the participants expressed their expectations of achievement and feelings of confidence and enthusiasm towards community learning, increasing their interaction (Source: webconferences and final report; e.g., students' comments and valuations).
- Increased interest in learning: During this central period of the implementation of the academic activity, as the students' interest increased, the teachers introduced activities with game ingredients, involving both the type of activities proposed in Twitter, and the feedback in the weekly webconferences (Source: Twitter activity and webconferences; e.g., number of tweets and quality in answers).

Final phase

- Discovering new ways for collaborative learning: In the final period of implementation the dynamics applied strengthened the development of a new form of community learning, of expressing oneself, of interacting and collaborating. In addition, the students found it progressively easier to adapt and synthesise their messages

(Source: Twitter activity; they interact with other students and combine general asseverations with arguments and mentions focussing other users' statements; they link to blogs, posts, and sites).

- Integration of a large number of learning resources: Their synthese capability was also reflected through the use of multiple resources available on the Internet (videos, images, presentations, comics, press news, didactic materials, etc.) instead words (Source: Twitter activity; e.g., they link to Pinterest, Instagram or YouTube contents that bases their arguments).
- Awareness of the evolution of competence acquisition: In this final stage the participants stated that, among other aspects, the use of the Twitter tool in the training process allowed them to improve their reflective and critical judgement competencies (e.g., increasing the number of arguments and references to other students' statements), their information searching and selection skills (e.g., providing references and links in their arguments), their collaboration with other members and their interaction with the group (e.g., increasing references and interactions as retweets and favourites) (Source: Twitter activity and final report).
- Comprehension of the learning sense based on the interaction: They further added that the Twitter Social Network provided a twofold benefit – in the training process and in the sphere of communication (Source: final report; e.g., the valuation of their experience).

Quantitative results

The main quantitative results obtained from the production generated by the students during the training process via the Twitter Social Network are given below. These refer to: the number of tweets, their degree of concentration depending on the day of the week, the response delay time, and the number of retweets occurring per week.

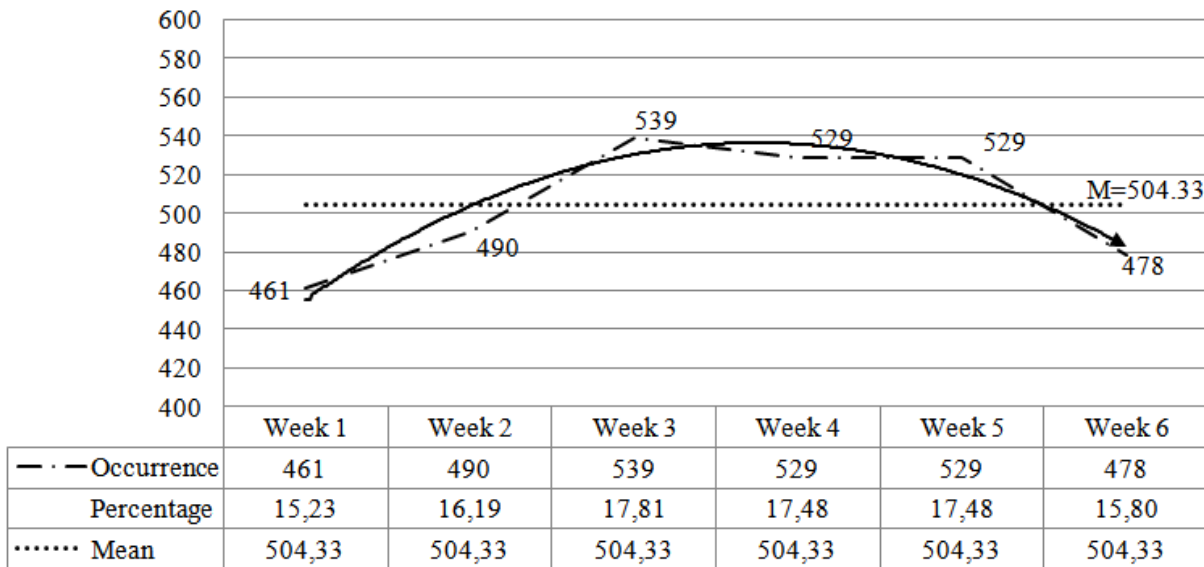


Figure 2. Number of tweets generated per week

The student's production in Twitter regarding the training activity subject to analysis took place during the months of June and July 2013. Over a six week period the level of participation in the Twitter Social Network shows an initial upward curve with a certain progressivity (Figure 2), with a steep rise during the 3rd (539 tweets), 4th (529 tweets) and 5th weeks (529 tweets) of the course, and a fall to a level similar to the first two weeks during the final week.

While the trend observed is reasonably in accordance with what might be expected, the irregular participation pattern over the different days of the week is quite striking, with a concentration around the days in which the teacher proposed the activities: Monday (28.75%), Tuesday (29.11%), and peaking on Wednesdays (33.31 %). This had the effect of raising the overall participation figures, with a value of $M = 432.28$. Likewise, those same days show a considerable level of activity in the tasks carried out by the students (Figure 3). Consequently, it can be deduced that although it was a distance education course, with students averaging over 30 years old who combined their studies with their jobs and other occupations (family, household or leisure), they did not devote their weekends to training

activities in this topic in Twitter. Unfortunately the level of learning activity via Twitter was extremely low on Fridays and Sundays (0.99 % and 0.13 %, respectively) and non-existent on Saturdays, as shown by the trend curve.

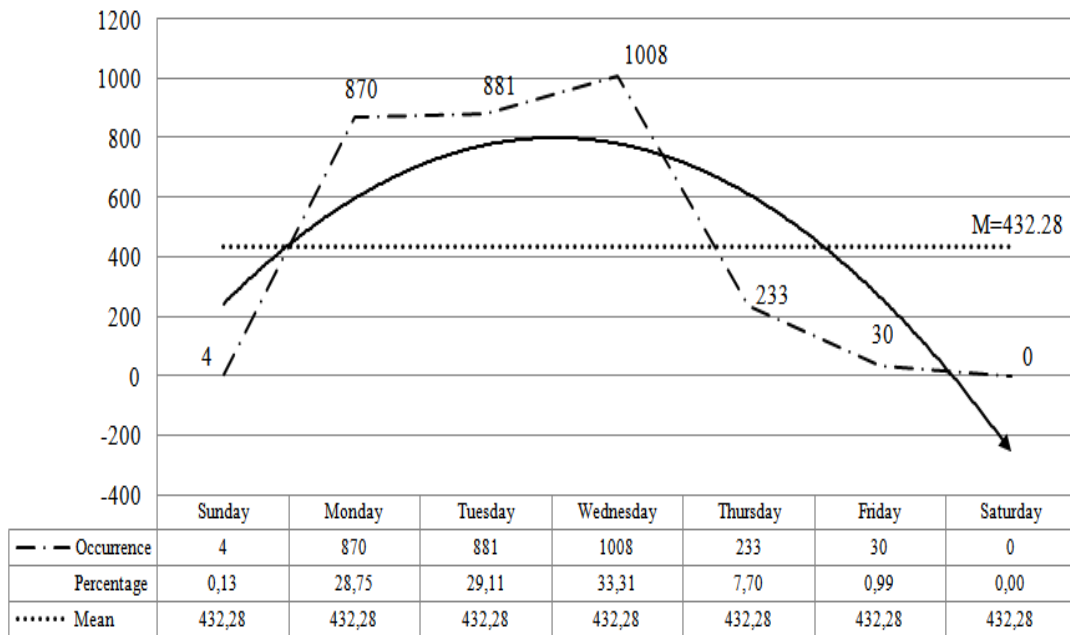


Figure 3. Number of tweets according to the day of the week

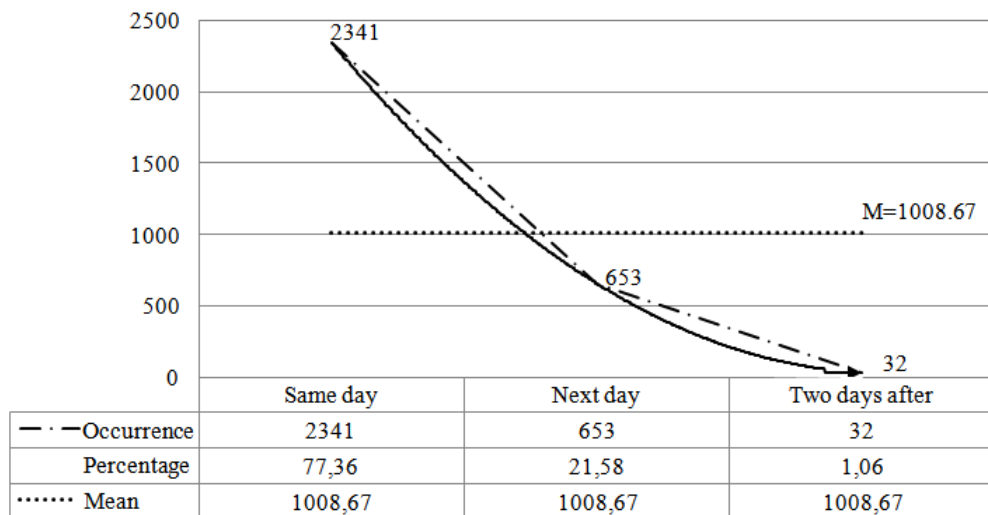


Figure 4. Response delay time

Moreover, it was observed that, although Twitter does not require the participants to be present simultaneously, since it is an asynchronous medium, the response delay time for the activities was in most cases very short (Figure 4). The practical activities were carried out mostly on the same day (77.36%) in which the teachers launched the proposals via the Twitter Social Network or on the day after they were proposed (21.58%), with an insignificant level of activity on the third day (1.06%), as reflected by the trend curve (though resulting in a high value of $M = 1008.67$ in overall terms). This indicates the commitment among the students was mediated by the training process, bringing the performance of the practical activities to a stop in subsequent days, despite the time interval before the launching of a new wave of activities.

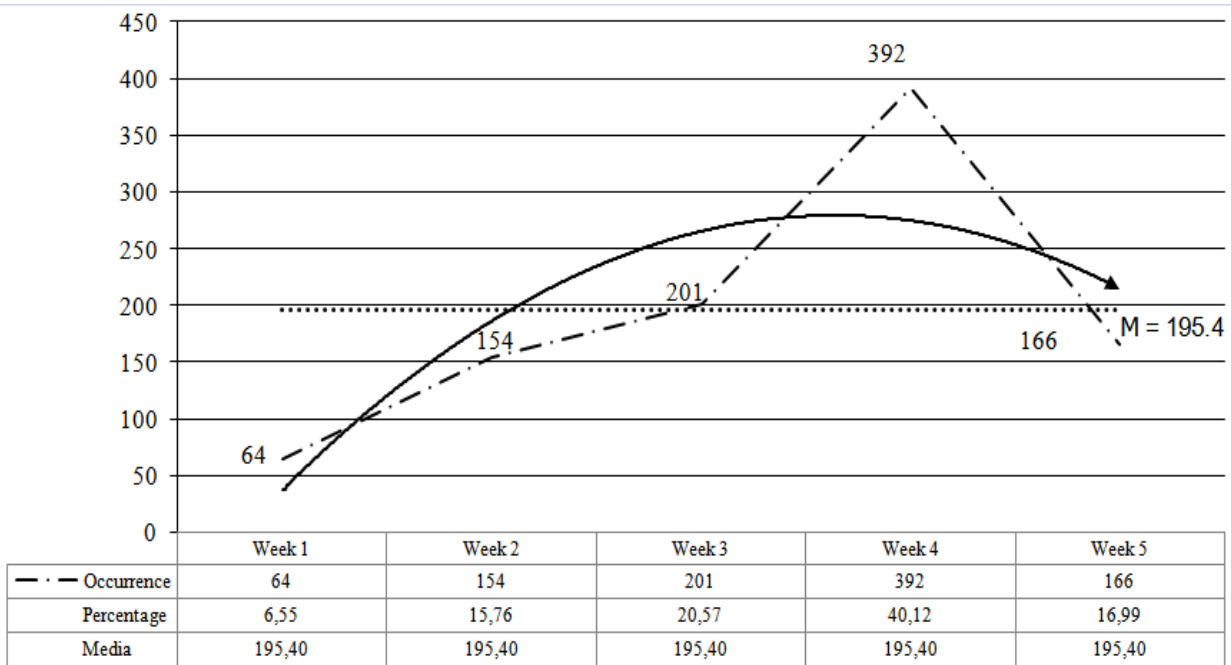


Figure 5. Occurrence of retweets per week

It is worth highlighting that out of a total of 3,026 tweets produced, 977 were retweets (32.29%). In response to the dynamic deriving from the characteristics of the platform used, the retweet is used as a support mechanism for the contributions between the members of the group. As evidenced by the quantitative analysis, since the monitoring of the process showed that the students were not spontaneously using the retweet from the outset, the teachers used different strategies and means (webconferences, chats, etc.) to emphasise the need for retweets and invite the students to use them. The retweets and the favourites are the two ways that Twitter provides to express agreement and support to other participants. Then they are two ways to increase interaction and develop the community. The teachers moreover included specific activities aimed at stimulating retweet use asking directly for retweeting the best answers in previous activities. This led to an observed rise in retweets during the course, with certain progressivity ($M = 195.4$), as can be seen from the trend curve (Figure 5). It is worth noting the substantial rise in this type of activity in the week before last (40.12%), followed by a sudden drop in retweet responses in the final week (16.99%), which, however, amply exceeded the production of retweets in the first week.

Discussion and conclusions

Based on the study we have carried out, it can be said that the use of Twitter in the training of university students is of great interest, the students' answers improve as they advance and, in the final phase, they become aware of the evolution of their competence acquisition. Then as they progressively gain familiarity with the use of the tool, their learning improves. Consequently, the academic activity undertaken through the means of this Social Network for the teaching of courses included in the higher education curriculum, presents no problems for its implementation. In another study (Wang, Wang, & Shi, 2013), it was noted with regard to this issue that Twitter is well accepted by students for the performance of academic activities.

Beyond a catalysing function, the present study reveals that the use of Twitter to carry out training with university students is a feasible proposition. Moreover, it promotes a pleasant and motivating learning climate. However, the initial phase of the academic implementation is the least rich and least conducive to students easily sharing and analysing they knowledge generated digitally by them. However, such aspects can be overcome through teacher guidance and with the aid of the possibilities afforded by the Web 2.0 tools, enabling students to obtain information extremely swiftly (Thelwall, 2008).

Moreover, this study shows that the restricted number of characters allowed by this tool contributes to sharpen the ingenuity of the participants, who turn to the plentiful and varied resources available on the Internet. This points to the interest of integrating materials into learning, both of a general and of a didactic nature, free of charge and freely available for educational purposes, without requiring special adaptations. The brief style of expression required by this tool allows them to save time in the performance of a specific task, though on the other hand the need to synthesise sometimes tends to extend the time required. It is worth highlighting that the use of Twitter helps students to improve their reflective, critical judgment and information selection skills. In another work, Wrighta (2010) stresses the interesting role played by the use of Twitter, with its restricted number of characters in contributing to perfecting the reflective thought of participants.

The participation of the higher education students in the training process via Twitter progressively increased as their own technical competence in the use of the tool improved and they were incentivised by carrying out varied, novel and innovative activities. This production evolution was already observed in several contexts (Fang, Zhang, Ye, & Li, 2014). The lower levels of production by the students in this platform were concentrated at the initial and final phases of the training process. In the former case this was essentially associated with lack of habit, while in the latter case, as might be expected, the level of commitment and pressure fall off. We find the same pattern, with substantial variations, in the level of activity over the days of the week, with greater involvement in the days following the presentation by the teachers of the practical activities on the web. Thus, the students' response was found to be contingent on the teacher's immediate proposal, rather than showing a greater measure of self-regulation, commitment and balanced distribution of the work, even though, as adults, one might expect of them to combine them with other kinds of tasks, responsibilities and interests. The activity reduction during the weekends is not surprising and is common to other virtual tools as it has been studied (Feliz, 2012).

The response delay time is according with other previous studies (Khatri et al., 2015) and reveals that, although Twitter is an asynchronous means, participants answer mainly in the same day when the activity was published. This feature of Twitter has also been reflected during the warning phase of a disaster event (Sutton et al., 2014).

The fact that the participants are not fully acquainted with the interaction mechanisms particular to the Twitter Social Network leads to a more individual use at the outset. Teachers must stress this weakness (since the students are receptive) clearly referring to it (in their considerations and guidance) and reinforcing such skills in the students (by means of various supporting activities). It must be emphasised that for a learning community, the retweet, among other mechanisms, is one of the most binding. It should be noted that higher education students show a good level of receptiveness, education and maturity, which contributes to improving the socio-relational climate in cyberspace.

Finally, the present study reveals that the initial individualistic behaviour patterns exhibited by higher education students with the use of Twitter in terms of communication, mainly arising from a lack of habit, show great resemblance with those usually occurring in a face-to-face class, with a prevalence of the vertical mode of interaction. Some other detected problems are related to the specific procedure to create the community identity using special hashtags and the abusive use of the answering mechanism of Twitter that produces mentions but avoids hashtags and the other content of the tweet. Therefore, the guidance provided by teachers plays a useful role in raising the level of interaction within the group, through tweets and retweets, and in improving the procedures to develop the learning community. In this regard Junco, Heiberger and Loken (2011) point out that when the teachers are more committed to the use of Twitter, the students will show stronger commitment and will attain higher levels of achievement in their academic and interaction results.

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