






Using Twitter in Higher Education in Spain and the USA

Uso de Twitter en Educación Superior en España y Estados Unidos

-  Dr. Gemma Tur is Associate Lecturer of the Department of Applied Pedagogy and Psychology of Education at the University of the Balearic Islands (Spain) (gemma.tur@uib.es) (<http://orcid.org/0000-0003-4508-6808>)
-  Dr. Victoria I. Marín is Postdoctoral Researcher of the Faculty of Education and Social Sciences of the University of Oldenburg (Germany) (victoria.marin@uni-oldenburg.de) (<http://orcid.org/0000-0002-4673-6190>)
-  Dr. Jeffrey Carpenter is Associate Professor in the School of Education at Elon University (United States) (jcarpenter13@elon.edu) (<http://orcid.org/0000-0002-9228-3962>)

ABSTRACT

This article examines student teachers' use and perceptions of Twitter, based on a mixed-method comparative approach. Participants (N=153) were education majors who used Twitter as a part of required coursework in their programs at two universities in Spain and the United States. The theoretical background covers research on international work carried out on Twitter as well as a brief overview of the introduction of technology in two educational national systems. Quantitative data were collected via a survey, while qualitative data were obtained from students' reflective written texts. The majority of participants from both contexts perceived educational benefits to Twitter. However, their use of Twitter, and the nature of their perceptions of its educational value, appeared to differ in important ways. The USA participants' longer and more frequent use of Twitter was accompanied by more positive beliefs regarding the educational relevance of Twitter. While many Spanish participants saw value in the use of Twitter to find and share information, USA students highlighted interactive and collaborative uses. The study uncovers some challenges for learning related to Twitter's short format. In the conclusion section we discuss implications for learning and teaching in an age of ubiquitous social media.

RESUMEN

El presente artículo examina los usos y las percepciones de estudiantes y profesores en relación a Twitter a partir de una investigación comparada con metodologías mixtas. Los participantes (n=153) fueron alumnos de educación de dos universidades en España y Estados Unidos (EE.UU.) que usaron Twitter como parte de una actividad del curso. El marco teórico abarca la investigación internacional sobre Twitter así como un breve repaso a la introducción de la tecnología en los dos sistemas educativos nacionales. Los datos cuantitativos se recogieron con un cuestionario mientras que los datos cualitativos se obtuvieron a través de los textos reflexivos escritos de los estudiantes. La mayoría de los participantes de los dos contextos percibieron los beneficios educativos de Twitter. Sin embargo, su uso de Twitter y la naturaleza de sus percepciones en relación a su valor educativo difirieron de forma significativa. Los participantes de EE.UU. usaron Twitter por más tiempo y de manera más frecuente a la vez que demostraron creencias más positivas en relación a la relevancia educativa de Twitter. Mientras que los participantes españoles valoraron el uso de Twitter para encontrar y compartir información, los estudiantes americanos destacaron los usos para la interacción y la colaboración. El estudio destapa algunos retos del formato breve de Twitter para el aprendizaje. En las conclusiones discutimos las implicaciones para la enseñanza aprendizaje en la era de la ubicuidad de los medios sociales.

KEYWORDS | PALABRAS CLAVE

Higher Education, e-learning, teacher training, didactic innovation, educational research, teacher reflection, ICT, social media, Twitter.

Educación Superior, e-learning, formación de profesorado, innovación didáctica, investigación educativa, reflexión docente, TIC, medios sociales, Twitter.



1. Introduction

This article addresses future educators' beliefs about and experiences with educational uses of the microblogging service Twitter. Research has suggested that successful ICT implementation is related to not only hardware and teachers' digital skills, but also to teachers' beliefs and attitudes (Ertmer & Ottenbreit-Leftwich 2013). Furthermore, it has been noted that teachers' attitudes regarding technology are influenced by their own learning experiences with technology as students (Hermans, Tondeur, van Braak, & Valcke 2008). Thus, attention to educators' beliefs and attitudes is considered by many to be necessary for successful ICT integration in educational systems (Teo, 2009; Tirado-Morueta & Aguaded, 2014).

While Twitter is used in many countries and has received significant attention in education (Junco, Heiberger, & Loken 2011; Carpenter & Krutka, 2014a), comparative research on this technology is relatively uncommon. Comparative studies of social media other than Twitter have generally aimed at exploring users' profiles and their habits and routines (Adnan, Leak, & Longleya, 2014; Amichai-Hamburger & Hayat, 2011; Ku, Chen, & Zhang, 2013; Jackson & Wang 2013). However, little previous comparative research on social media has addressed educational applications. Although some research on social media in education has included international samples (Wesely, 2013), a comparative approach that seeks to parse differences among participants from various countries or contexts has been missing.

The current study is based on required, course-based use of Twitter by university students majoring in education fields, which was mainly aimed at enhancing participants' engagement with course content and building their digital skills. It also provided an early experience meant to influence the participants' attitudes and beliefs regarding the use of social media for learning and teaching in their future professional careers. In a previous stage of research (Carpenter, Tur, & Marín, 2016), student teachers' perceptions of Twitter for their learning and their future professional careers were explored. However, some questions arose from this phase: can these perceptions be influenced by students' real usage? Are there differences in the way students use Twitter for educational aims? Also, while the impact on students' learning of some characteristics of Twitter have already been explored, more information was needed and Twitter's format is further explored in this new step. Thus, this article explores relatively under-researched aspects of the impact of ICT and social media in the educational systems of the USA and Spain from a comparative perspective. Analysing students' reported behaviours and perceptions, this work explores commonalities and differences in the impact of social media, and Twitter in particular, on educational experiences in these two countries.

2. Background

2.1. Twitter in education

There is a growing interest regarding Twitter in many research areas. In education, previous studies have focused on the employment of microblogging for learning aims and its possible support of innovative teaching practices. Twitter has been employed for diverse teaching practices since soon after its launch in 2006 (Carpenter & Krutka 2014a; Castañeda, Costa, & Torres-Kompen, 2011). Shah, Shabgahi and Cox (2015) suggested four uses of Twitter for learning: formal and informal learning community, collaborative learning, mobile learning and reflective thinking. Several studies, such as those by Carpenter (2014), Kassens-Noor (2012), Marín and Tur (2014), Mercier, Rattray and Lavery (2015) and Tur and Marín (2015), have explored the enhancement of informal and collaborative learning with Twitter. Some research has suggested that such collaboration can reach the level of a Community of Practice (De-Paoli & Larooy, 2015; Wesely, 2013). Studies have also demonstrated the impact of Twitter on learning and students' engagement (Junco, Heiberger, & Loken, 2011; Junco, Elavsky, & Heiberger, 2013) and in particular to overcome obstacles to participation in the context of large-lecture classrooms (West, Moore, & Barry, 2015). Twitter has been explored as a tool to support teachers' professional development (Carpenter & Krutka, 2014a; 2015). The extant literature has also identified challenges associated with educational uses of Twitter, such as the potential for the information flow to be overwhelming for some users (Davis, 2015).

2.2. ICT and Social Media in the Educational Systems of the USA and Spain

Nowell's (2014) research reported that social media use with U.S. students can improve student-teacher relationships and extend learning beyond the classroom. In the case of Twitter, its use by U.S. educators appears to have been on the rise in recent years (Lu, 2011; University of Phoenix, 2014). Kurtz (2009: 2) described how Twitter provided elementary school parents and families "windows into their children's days", while Hunter and

Caraway (2014) reported that Twitter positively impacted high school students' literature engagement and motivation. Twitter does, therefore, appear to offer real educational potential. It remains to be seen, however, to what degree that potential will be realized.

What is now generally understood is the need in Spain to develop students' digital skills (Area & al., 2014). The Escuela 2.0 programme, which is based on the characteristics of Web 2.0 and social media tools, postulates that every individual can generate and share knowledge (Correa, Losada, & Fernández, 2012). The increased use of Web 2.0 tools for educational aims is likely related to the increase in the use of social media and the development of a knowledge society in Spain. Innovative social media use to support K-12 students collaboration and learning has been documented by Basilotta and Herrada (2013). Blogging by primary and secondary students is quite common, as evidenced by the annual awards "Espiral Edublogs" given to student blogs at all grade levels since 2007 (<https://goo.gl/8RMxbO>).

Educational activities with Twitter, however, are not yet as common. Muñoz (2012) reported some use of Twitter in the contexts of primary and secondary level history, philosophy, language learning and storytelling activities. Activities from literature classes based on Spanish masterpieces, such as "El Lazarillo de Tormes" (Molina, 2011) or "Don Quijote" (Domenech, 2015), have also been documented.

This paper describes a rather uncommon comparative, mixed-methods study of 153 U.S. and Spanish university students' perceptions of Twitter after they experienced required use of Twitter in one of their teacher education courses. Our paper offers new insights into understanding the perspectives of the university students –who in this case are also the next generation of teachers– regarding the educational value of these technologies and the possibilities of Twitter's format for learning.

3. Research

3.1. Context

This study was set in two different higher education institutions. The sample was one of convenience; the researchers, as employees at these institutions, knew that trainee teachers were using Twitter for required coursework at each university. The University of the Balearic Islands in Spain is the only public university in the region of the Balearic Islands and has different units on the islands of Majorca, Menorca and Ibiza. The university has approximately 11,000 undergraduate and 2000 postgraduate students. Elon University is a private university in the southeast of the United States that enrolls approximately 6000 students.

3.2. Participants

The participants from the University of the Balearic Islands were from the Majorca and Ibiza campuses. They were all students preparing to be teachers, most of them undergraduates (n=85) and, in addition, some postgraduates in Ibiza (n=15). In the case of Majorca, participants were students in their third year of study preparing to be primary school teachers. In Ibiza, primary student teachers were in their first year of study and the other students were studying a Master's degree program in preparation for teaching. The participants (n=53) from Elon University were all undergraduates in their second, third, or fourth year of studies. The Elon students were preparing to be teachers in a variety of subject areas and at the primary and secondary levels.

3.3. Twitter procedure

Participants in both countries used Twitter as a part of required coursework. Tasks varied according to the different courses in which the participants were enrolled. In both contexts, students were required to have a public Twitter account. They had to "follow" the Twitter accounts of their classmates and other educators or educational organizations beyond their classmates. Students were also required to send a minimum number of tweets that included a course hashtag and related to course content. In the U.S., participants also were required to participate in

Twitter chats, which are one-hour long, synchronous Twitter discussions focused on a particular topic (Carpenter & Krutka, 2014b). At semester's end, the students in both settings submitted written reflections on their use of Twitter.

3.4. Research questions

This work aimed to explore the differences in uses of and beliefs regarding social media, in particular Twitter, among students in the USA and Spain. Thus, this study addressed the following research questions:

- Are there differences in the way U.S. and Spanish students use Twitter?
- Are there differences in the way U.S. and Spanish students perceive the educational use of Twitter?
- Are there differences in the way U.S. and Spanish students perceive the short format of Twitter and its impact on learning?

3.5. Methodology

With the aim of a comparative study in mind, we collaborated to design an anonymous online questionnaire to be implemented in both contexts. This instrument, which was designed in Spanish and English to be adapted to each university, gathered quantitative data regarding student experiences with Twitter and their perceptions of Twitter and other social media. At the end of the semester, we asked the participants to write a reflection on their personal experience with the use of Twitter in order to gather qualitative data that would provide rich description and examples to supplement the quantitative findings.

3.6. Instrument

The survey used in Carpenter and Krutka's (2014a; 2015) research on educators' use of Twitter was the starting point for the creation of the instrument for this study. The authors' own experiences and the existing literature on social media use in education informed an initial survey draft in English. We considered cultural differences in order to try to design a survey that would allow participants from both countries to describe their experiences and perceptions. The survey was translated into Spanish, and reviewed by a colleague to ensure that items would be clear to participants. The instrument gathered descriptive statistics regarding the participants, and also included closed questions. The closed questions were measured on nominal or five-point ordinal Likert scales.

4. Results

The questionnaire was answered by 153 participants: 100 education majors from Spain (65.4%) and 53 from the U.S. (34.6%).

a) Research Question 1: Are there differences in the way U.S. and Spanish students use Twitter? Participants were asked about whether they used Twitter for academic and/or personal reasons (Table 1). In both contexts, majorities reported use for academic and personal purposes. Because the participants were required to use Twitter for at least one of their courses, there were only a few respondents who indicated solely personal purposes.

A chi-square test for association indicated there was not a statistically significant association between nationality and the balance of academic and personal use, $\chi^2(2) = 1.503$, $p = .472$.

	% Spain	% US
I use Twitter for academic purposes	42	35.9
I use Twitter for academic and personal purposes	51	60.4
I use Twitter for personal purposes	7	3.8

Participants were also asked about their following behavior on Twitter. The survey allowed respondents to choose from a list of types of Twitter users and indicate a percentage for how much they followed each type. The average percentages are shown in Table 2. While among the U.S. students, classmates (29%), education organizations (19.6%) and friends (17%) were most popular, students from the Spain highlighted other educators –non classroom teachers– (20.2%), classmates (19.2%), education organizations (17.7%) and in-service teachers (17%). Because of outliers and the non-normal distribution of the data, independent-samples t-tests were determined to be inappropriate for analyzing this data, and Mann Whitney U tests were instead conducted. Mean rank scores for U.S. and Spanish students were not significantly different for following of in-service teachers ($U = 2266.5$, $z = -1.480$, $p = .139$), educational organizations, ($U = 2318$, $z = -1.287$, $p = .198$), friends ($U = 2631$, $z = .070$,

$p=.944$), and celebrities ($U=2494$, $z=-.628$, $p=.530$). Mean rank scores for U.S. and Spanish participants were, however, statistically significantly different for following classmates ($U=1631.5$, $z=-3.934$, $p<.001$) and other educators who were not classroom teachers ($U=1688.5$, $z=-3.718$, $p<.001$). Respondents were also

asked if they followed hashtags apart from the required course hashtag (Table 3). U.S. students were significantly more likely to follow additional hashtags ($\chi^2(1) = 15.832$, $p<.001$).

b) Research question 2: Are there differences in the way U.S. and Spanish students perceive the educational use of Twitter? Concerning the uses of Twitter that were most relevant for the students' learning in the course, participants from both universities highlighted resource sharing, reflecting, and communicating with classmates (Table 4). However, opinions regarding the relevance of many other

Twitter uses differed between the two countries. For example, for participants from Spain finding up to date information (69%) was also important; whereas for U.S. respondents participating in Twitter chats (79.3%), collaborating with teachers and other educators (60.4%), and engaging in discussions (60.4%) were more relevant. U.S. participants also tended to perceive a wider variety of relevant learning applications for Twitter, selecting on average 5.86 different uses in contrast to 4.02 relevant uses selected by Spanish participants. These differences in relevance may in part be explained by some of the variation in what students were asked to do in the courses in the two countries. That the U.S. students had, on average, been using Twitter longer for academic purposes might also have contributed to their perceiving a wider variety of relevant learning uses.

Comments from participants' reflections provided more detailed glimpses of their perceptions of the educational use of Twitter. For example, a Spanish student credited Twitter with helping her to integrate ideas from her course: "I think that we have used it most to transmit the information we found on our own and share it, a true cooperative work. It has been useful to me to put in their place the pieces of many concepts that we were working with in class". A U.S. student appreciated the multifaceted nature of Twitter and how participants can tailor their use to meet their needs: "I had the ability to follow and connect with so many people on Twitter this semester. I read articles I may not have encountered had it not been for Twitter. I participated in Twitter chats and met teachers who were supportive and gave me great ideas for the future. I truly learned that you can use it to various extents and for

Table 2. Which of the following groups or types of people do you follow on Twitter?

	Spain % average	U.S. % average
Classmates	19.2	29.0
In-service teachers	17.0	14.0
Other educators (non classroom teachers)	20.2	10.7
Education organizations	17.7	19.6
Friends	11.3	17.0
Celebrities	7.9	6.9
Other	6.7	2.8

Table 3. During the semester, did you follow hashtags other than the course hashtag?

	% Spain	% U.S.
Yes	17	47.2
No	83	52.8

Table 4. What uses of Twitter have been most relevant for your learning in this course? (Check all that apply)

	Total number Spain	% Spain	Total number U.S.	% U.S.	$\chi^2(1)$	p value
Resource sharing	77	77	40	75.5	0.045	.832
Finding up to date information	69	69	19	35.9	15.58	<.001
Reflection	46	46	17	32.1	2.773	.096
Communicating with classmates	40	40	27	50.9	1.685	.194
Collaborating with teachers and other educators	22	22	32	60.4	22.34	<.001
Engaging in discussions	33	33	32	60.4	10.626	.001
Participating in Twitter chats	6	6	42	79.3	86.317	<.001
Participating in out-of-class activities	30	30	20	37.4	0.942	.332
Participating in in-class activities	21	21	19	35.9	3.956	.047
Communicating with the instructor	13	13	16	30.2	6.662	.010
Networking	9	9	17	32.1	13.076	<.001
Participating in a professional community	8	8	18	34	16.553	<.001
Emotional support	8	8	4	7.6	0.01	.921
Backchanneling (electronic conversation that occurs in parallel to face-to-face conversation)	4	4	5	9.4	1.848	.174
Receiving mentoring from the instructor	2	2	2	3.8	0.428	.513

different purposes. You can use Twitter however it would best meet your needs and that may be different for every person. I learned from my professor, fellow students, and other individuals related to the world of education”.

c) Research question 3: Are there differences in the way U.S. and Spanish students perceive the short format of Twitter and its impact on learning?

Although many respondents indicated that they perceived multiple relevant uses of Twitter to support their learning in their courses, there was some apparent ambivalence regarding Twitter’s format. One survey item explicitly addressed a potential learning constraint associated with Twitter, asking students their level of agreement with the statement “Twitter’s short format has not allowed me to express my ideas.” For this item, opinions were quite divided (Table 5). A Mann-Whitney U test was run to determine if there were statistically significant differences in beliefs about the limitations of Twitter’s short format between Spanish and U.S. respondents. Distributions of the Likert scores for Spanish and U.S. students were broadly similar, as assessed by visual inspection. Likert scores for U.S. participants were not statistically significantly different from their Spanish peers, $U = 2273$, $z = -1.496$, $p = .135$.

A number of students from both Spain and the U.S. commented in their reflection papers on times that they felt that Twitter did not allow them to communicate their ideas in ways that they preferred. For example, one U.S. participant commented, “Too often I had to edit my tweets to be shorter than I had originally intended, which was frustrating as often I could not say exactly what I wanted due to the word limit.” And a Spanish student explained,

«I am too introspective to make quick contributions as [Twitter] needs; I think too much about things before

	Country	Strongly agree	Somewhat agree	Neutral	Somewhat disagree	Strongly disagree
Twitter’s short format has not allowed me to express my ideas	Spain	9%	28%	24%	29%	10%
	U.S.	11.3%	37.7%	20.8%	26.4%	3.8%
Twitter’s short format has helped me to summarise main ideas	Spain	13%	48%	24%	11%	4%
	U.S.	35.9%	41.5%	11.3%	11.3%	0%

doing them. To write a tweet I have to believe what I write or what I retweet is interesting enough. This means reading well what you are going to write, verifying the reliability of what you say and the source that you use, and looking for the ideas that offer different views... all this is impossible [on Twitter], because it wouldn’t be so immediate as it is supposed to be».

Despite such critiques of limitations associated with Twitter’s short format, a majority of students from both countries indicated either strongly agree or somewhat agree with the statement “Twitter’s short format has helped me to summarise main ideas” (Table 5). A Mann-Whitney U test was run to determine if there were statistically significant differences in beliefs about this particular benefit of Twitter’s short format between Spanish and U.S. participants. Distributions of the Likert scores for Spanish and U.S. students were not similar, as assessed by visual inspection. Likert scores for U.S. respondents were statistically significantly lower, indicating stronger agreement, than for Spanish peers, $U = 1918$, $z = -2.979$, $p = .003$.

5. Discussion and conclusion

Twitter is sometimes dismissed as the frivolous domain of oversharing teens, vain celebrities, and relentless self-promoters, but in reality these media impact a wide range of serious phenomena such as journalism, political campaigning, protest movements, business marketing, and charity fundraising (Shirky, 2011; Theocharis, Lowe, van Deth, & García-Albacete, 2015). Our results suggest that students from two different countries perceived that Twitter can also have a meaningful impact in the educational sphere. Students from both contexts indicated they followed classmates and other professional users or institutions more than friends or celebrities, suggesting that despite its reputation, Twitter may be an appropriate tool for educational and professional aims.

The potential for flexible and open learning associated with the introduction of social media into education (Salinas, 2013; Marín, Negre, & Pérez-Garcías, 2014; Marín & Tur, 2014), together with policies in the USA and Spain that have promoted the integration of ICT in schools, indicate that teacher education programmes should consider how to prepare prospective teachers for new and challenging learning environments. Furthermore, if educators’ attitudes and beliefs about teaching and learning with technology are formed at early stages, even while they themselves are students (Hermans, Tondeur, van-Braak, & Valcke, 2008), and if beliefs can become the most important barriers for future uptake (Ertmer & Ottenbreit-Leftwich, 2013), it seems that teacher education pro-

grammes should attend to their students' beliefs and perceptions regarding educational uses of technology.

The current work is in line with recent research that focused on attitudes and beliefs for successful ICT integration in educational institutions (Teo 2009; Tirado-Morueta & Aguaded, 2014). Furthermore, this work is a step forward in research since it considers educational usages, affordances and drawbacks from a comparative perspective.

In the case of our participants, many in Spain and some in the United States revealed that they had not previously used Twitter for educational purposes, and quite a few expressed surprise at realizing such applications for Twitter. This fact reinforces the need to provide supposed "digital native" students with guidance regarding educational applications of technologies; young people do not inevitably recognize and/or engage with technologies' learning affordances (Luckin & al., 2009). Scaffolded learning experiences with social media could help to change attitudes and beliefs towards more favourable positions. However, despite majorities in both contexts indicating that they did see educational potential in Twitter, there were still some students who remained skeptical. In our sample, data showed that students in Spain mostly used Twitter for academic purposes for the first time during the semester of our research, whereas more U.S. participants had previously engaged in academic uses of Twitter.

Our research aligns with previous studies that have suggested Twitter's capacities to impact student learning, especially in terms of collaboration skills, participation, engagement, and course results (Carpenter, 2014; Junco, Heiberger, & Loken, 2011; Junco, Elavsky, & Heiberger, 2013; Kassens-Noor, 2012; West, Moore, & Barry, 2015). With the aim of exploring particular aspects of this impact, this current research has observed that Twitter has mostly involved students in sharing and finding resources, debating and communicating and, reflecting. Qualitative data confirms this impact, with

The data suggest positive attitudes among participants towards their own learning experiences with Twitter. Our research may encourage educators to consider ways in which Twitter can be leveraged to support learning, and contextual factors that may affect how social media are utilized and experienced in different settings. We found a number of significant differences between the perceptions and intentions of the participants from the two different countries, some that appeared to be rooted in differences in digital cultures.

many of the students noting their surprise regarding the educational value of these activities. Also, the very few comments in Spain about having followed external hashtags is coherent with the low percentage achieved by items related to external discussions. Furthermore, written reflections by students in both countries note the potentially overwhelming impact of access to so much information, which is consistent with conclusions by Davis (2015). Considering the main educational usages of Twitter defined in prior research (Shah, Shabgahi, & Cox, 2015) it seems that students have observed the impact of Twitter for formal and collaborative learning and reflection, and more work would be needed to also enhance informal and mobile learning.

When comparing the experiences of the participants from Spain and the U.S., the U.S. context appeared to be one in which the greater presence of chats and hashtags created more opportunities for Twitter interactions that were attractive to the participants. Van-Dijck (2011) noted that Twitter can be used in a variety of ways; while chats in the U.S. may have allowed participants to use Twitter more as a two-way communication tool, the less prevalent chat and hashtag use by the Spanish participants may have defined Twitter for them as more of an information and resource sharing tool. Although such sharing can be worthwhile, it may be a less compelling reason for trainee teachers to utilize Twitter if they are already accustomed to accessing more traditional media for information acquisition.

Rather than identifying differences in the general, monolithic U.S. and Spanish cultures that affected the participants' perceptions of Twitter, our findings thus appear to suggest that differences in online practices associated with how technologies are employed in different countries or regions may influence users' perceptions and uses of

technology. Although offline cultures likely influence online behaviors in many cases, there may not always be solely a one-way causal relationship (Qiu, Lin, & Leung, 2013).

Future implementations of educational activities with Twitter should explore the possibilities of two challenging lines of research. First of all, international collaboration among students could be an interesting new iteration since there is evidence that an interactive use of the Internet is related to higher academic achievement (Torres-Díaz, Duarte, Gómez-Alvarado, Marín-Gutiérrez, & Segarra-Faggioni, 2016). Secondly, how educational applications of Twitter can contribute to the development of high level thinking skills appears to be an area worthy of exploration.

This study is limited by convenience sampling, which resulted in different group sizes from the two different countries. However, our findings offer a beginning step in research in which the challenging and promising focus is the learning impact that Twitter can have in different academic contexts. Before future research can compare the learning context in greater depth, some previous knowledge on general usage and perception was needed. Thus, from now on, further comparative studies can explore the nuances of the impact of Twitter observed in this study. Future work is needed to promote the educational usage of social media for high level cognitive skills, such as reflection, critical thinking skills, and self-regulated learning, as suggested by recent research (Herro, 2014; Matzat & Vrieling, 2015), and explore the possible differences in terms of age and gender. Finally, since cultural factors could impact social media usage (Carpenter, Tur, & Marín, 2016) new research could address Twitter usage in terms of cultural differences in two main ways: on the one hand, for example, addressing how cultural differences in social norms and anxiety (Heinrichs, & al., 2006) could influence students' behavior in Twitter; on the other hand, focusing on the educational system, how cultural differences in teaching and learning processes –see for example the model of the four dimensions (Hofstede, 1986)– could influence usages and perceptions of Twitter and social media in general. Likewise, since a process of Americanization of the Spanish Higher Education system has been reported (Lalueza & Collell, 2013), it would be challenging to explore how Twitter is contributing to this phenomenon.

References

- Adnan, M., Leak, A., & Longleya, P. (2014). A Geocomputational Analysis of Twitter Activity around Different World Cities. *Geo-spatial Information Science*, 17(3), 145-152. <https://doi.org/10.1080/10095020.2014.941316>
- Amichai-Hamburger, Y., & Hayat, Z. (2011). The Impact of the Internet on the Social Lives of Users: A Representative Sample from 13 Countries. *Computers in Human Behavior*, 27, 585-589. <https://doi.org/10.1016/j.chb.2010.10.009>
- Area, M., Alonso, C., Correa, J.M., del-Moral, M.E., de-Pablos, J., Paredes, J., Peirats, J., Sanabri, A.L., San-Martín, A., & Valverde, J. (2014). Las políticas educativas TIC en España después del Programa Escuela 2.0: Las tendencias que emergen. *Relatec*, 13(2), 11-33. <https://doi.org/10.17398/1695-288X.13.2.11>
- Basilotta, V., & Herrada, G. (2013). Aprendizaje a través de proyectos colaborativos con TIC. Análisis de dos experiencias en el contexto educativo. *EduTec*, 44. (<https://goo.gl/CwdssM>) (2016-10-10).
- Carpenter, J.P. (2014). Twitter's Capacity to Support Collaborative Learning. *International Journal of Social Media and Interactive Learning Environments*, 2(2), 103-118. <https://doi.org/10.1504/IJSMILE.2014.063384>
- Carpenter, J.P., & Krutka, D.G. (2014a). How and Why Educators Use Twitter: A Survey of the Field. *Journal of Research on Technology in Education*, 46(4), 414-434. <https://doi.org/10.1080/15391523.2014.925701>
- Carpenter, J.P., & Krutka, D.G. (2014b). Chat it Up: Everything you Wanted to Know about Twitter Chats but Were Afraid to Ask. *Learning and Leading with Technology*, 41(5), 10-15. (<https://goo.gl/zptefV>) (2016-10-10).
- Carpenter, J.P., & Krutka, D.G. (2015). Engagement through Microblogging: Educator Professional Development via Twitter. *Professional Development in Education*, 41(4), 707-728. <https://doi.org/10.1080/19415257.2014.939294>
- Carpenter, J.P., Tur, G., & Marín, V.I. (2016). What do USA and Spanish Pre-service Teachers Think about Educational and Professional use of Twitter? A Comparative Study. *Teaching and Teacher Education*, 60, 131-143. <https://doi.org/10.1016/j.tate.2016.08.011>
- Castañeda, L., Costa, C., & Torres-Kompen, R. (2011). *The Madhouse of Ideas: Stories about Networking and Learning with Twitter*. Conference 2011, Southampton, UK. (<https://goo.gl/BWtO5L>) (2016-10-10).
- Correa, J., Losada, D., & Fernández, L. (2012). Políticas educativas y prácticas escolares de integración de las tecnologías en las escuelas del País Vasco: Voces y cuestiones emergentes. *Campus Virtuales*, 1(1), 21-30. (<https://goo.gl/szxG2K>) (2016-10-10).
- Davis, K. (2015). Teachers' Perceptions of Twitter for Professional Development. *Disability and Rehabilitation*, 37(17), 1551-1558. <https://doi.org/10.3109/09638288.2015.1052576>
- De-Paoli, S., & Laroooy, A. (2015). Teaching with Twitter: Reflections on Practices, Opportunities and Problems. Paper in *EUNIS 2015*, Dundee, Scotland (UK), 10-12 June. (<https://goo.gl/tqxx0h>) (2016-10-10).
- Domenech, M. (2015). *Completamente quirotizados. La rebotica de literlengua*. [Web log post]. (<https://goo.gl/J8BTjt>) (2016-10-10).
- Ertmer, P.A., & Ottenbreit-Letwisch, A. (2013). Removing Obstacles to the Pedagogical Changes Required by Jonassen's Vision of Authentic-enabled Learning. *Computers & Education*, 64, 175-182. <https://doi.org/10.1016/j.compedu.2012.10.008>
- Heinrichs, N., Rapee, R.M., Alden, L.A., Bögels, S., Hofmann, S.G., Oh, K.J., & Sakano, Y. (2006). Cultural Differences in Perceived Social Norms and Social Anxiety. *Behaviour Research and Therapy*, 44(8), 1187-1197. <https://doi.org/10.1016/j.brat.2005.09.006>
- Hermans, R., Tondeur, J., Van-Braak, J., & Valcke, M. (2008). The Impact of Primary School Teachers' Educational Beliefs on the

- Classroom Use of Computers. *Computers & Education*, 51, 1499-1509. <https://doi.org/10.1016/j.compedu.2008.02.001>
- Herrero, D. (2014). Techno Savvy: A Web 2.0 Curriculum Encouraging Critical Thinking. *Educational Media International*, 51(4), 259-277. <https://doi.org/10.1080/09523987.2014.977069>
- Hofstede, G. (1986). Cultural Differences in Teaching and Learning. *International Journal of Intercultural Relations*, 10(3), 301-320. [https://doi.org/10.1016/0147-1767\(86\)90015-5](https://doi.org/10.1016/0147-1767(86)90015-5)
- Hunter, J.D., & Caraway, H.J. (2014). Urban Youth Use Twitter to Transform Learning and Engagement. *The English Journal*, 103(4), 76-82. (<https://goo.gl/xFZA9h>) (2016-10-10).
- Jackson, L., & Wang, J.L. (2013). Cultural Differences in Social Networking Site Use: A Comparative Study of China and the United States. *Computers in Human Behavior*, 29, 910-921. <https://doi.org/10.1016/j.chb.2012.11.024>
- Junco, R., Elavsky, M.C., & Heiberger, G. (2013). Putting Twitter to the Test: Assessing Outcomes for Student Collaboration, Engagement and Success. *British Journal of Education Technology*, 44(2), 273-287. <https://doi.org/10.1111/j.1467-8535.2012.01284.x>
- Junco, R., Heiberger, G., & Loken, E. (2011). The Effect of Twitter on College Student Engagement and Grades. *Journal of Computer Assisted Learning*, 27(2), 119-132. <https://doi.org/10.1111/j.1365-2729.2010.00387.x>
- Kassens-Noor, E. (2012). Twitter as a Teaching Practice to Enhance Active and Informal Learning in Higher Education: The Case of Sustainable Tweets. *Active Learning in Higher Education*, 13(1), 9-21. <https://doi.org/10.1177/1469787411429190>
- Ku, Y.C., Chen, R., & Zhang, H. (2013). Why do Users Continue Using Social Networking Sites? An Exploratory Study of Members in the United States and Taiwan. *Information & Management*, 50, 571-581. <https://doi.org/10.1016/j.im.2013.07.011>
- Kurtz, J. (2009). Twittering about learning: Using Twitter in an Elementary School Classroom. *Horace*, 25(1), 1-4. (<https://goo.gl/QhALU2>) (2016-10-10).
- Lalueza, F., & Collell, M.R. (2013). Globalization or Americanization of Spanish Higher Education? A Comparative Case Study of Required Skills in the Higher Education Systems of the United States and Spain. *Razón y Palabra*, 17(4-85). (<https://goo.gl/2A54Df>) (2016-10-10).
- Lu, A. (2011). Twitter Seen Evolving into Professional Development Tool. *Education Week*, 30(36), 20. (<https://goo.gl/jA70Ho>) (2016-10-10).
- Luckin, R., Clark, W., Graber, R., Logan, K., Mee, A., & Oliver, M. (2009). Do Web 2.0 Tools really Open the Door to Learning? Practices, Perceptions and Profiles of 11-16 year-old Students. *Learning, Media and Technology*, 34(2), 87-104. <https://doi.org/10.1080/17439880902921949>
- Marín, V.I., Negre, F., & Pérez-Garcías, A. (2014). Entornos y redes personales de aprendizaje (PLEPLN) para el aprendizaje colaborativo [Construction of the Foundations of the PLE and PLN for Collaborative Learning]. *Comunicar*, 42, 35-43. <https://doi.org/10.3916/C42-2014-03>
- Marín, V.I., & Tur, G. (2014). Student Teachers' Attitude towards Twitter for Educational Aims. *Open Praxis*, 6(3), 275-285. <https://doi.org/10.5944/openpraxis.6.3.125>
- Matzaf, U., & Vrieling, E.M. (2015). Self-regulated Learning and Social Media - A 'Natural Alliance'? Evidence on Students' Self-regulation of Learning, Social Media Use, and Student-teacher Relationship. *Learning, Media and Technology*, 41(1), 73-99. <https://doi.org/10.1080/17439884.2015.1064953>
- Mercier, E., Rattray, J., & Lavery, J. (2015). Twitter in the Collaborative Classroom: Micro-blogging for In-class Collaborative Discussions. *International Journal of Social Media and Interactive Learning Environments*, 3(2), 83-99. <https://doi.org/10.1504/IJSMILE.2015.070764>
- Molina, A. (2011). *El Lazarillo de Tormes en Twitter*. Plataforma Educa. [Web log post]. (<https://goo.gl/Zn9QB4>) (2016-10-10).
- Muñoz, F. (2012). *Experiencias didácticas con Twitter*. Educa con TIC. [Blogpost]. (<https://goo.gl/UPgyVk>) (2016-10-10).
- Nowell, S.D. (2014). Using Disruptive Technologies to make Digital Connections: Stories of Media Use and Digital Literacy in Secondary Classrooms. *Educational Media International*, 51(2), 109-123. <https://doi.org/10.1080/09523987.2014.924661>
- Salinas, J. (2013). Enseñanza flexible y aprendizaje abierto, fundamentos clave de los PLEs. In L. Castañeda, & J. Adell (Eds.), *Entornos personales de aprendizaje: Claves para el ecosistema educativo en Red* (pp. 53-70). Alcoy: Marfil.
- Shah, N.A.K., Shabgahi, S.L., & Cox, A.M. (2015). Uses and Risks of Microblogging in Organisational and Educational Settings. *British Journal of Educational Technology*, 47(6), 1168-1182. <https://doi.org/10.1111/bjet.12296>
- Shirky, C. (2011). Political Power of Social Media: Technology, the Public Sphere, and Political Change. *Foreign Affairs*, 90(1), 28-41. (<https://goo.gl/1Th2FL>) (2016-10-10).
- Teo, T. (2009). Modelling Technology Acceptance in Education: A Study of Pre-service Teachers. *Computers & Education*, 52(2), 302-312. <https://doi.org/10.1016/j.compedu.2008.08.006>
- Theocharis, Y., Lowe, W., Van-Deth, J.W., & García-Albacete, G. (2015). Using Twitter to Mobilize Protest Action: Online Mobilization Patterns and Action Repertoires in the Occupy Wall Street, Indignados, and Aganaktismenoi movements. *Information, Communication & Society*, 18(2), 202-220. <https://doi.org/10.1080/1369118X.2014.948035>
- Tirado-Morueta, R., & Aguaded, I. (2014). Influencias de las creencias del profesorado sobre el uso de la tecnología en el aula. *Revista de Educación*, 363, 230-255. <https://doi.org/10.4438/1988-592X-RE-2012-363-179>
- Torres-Díaz, J.C., Duart, J.M., Gómez-Alvarado, H.F., Marín-Gutiérrez, I., & Segarra-Faggioni, V. (2016). Internet Use and Academic Success in University Students. [Usos de Internet y éxito académico en estudiantes universitarios]. *Comunicar*, 48(24), 61-70. <https://doi.org/10.3916/C48-2016-06>
- Tur, G., & Marín, V.I. (2015). Enhancing Learning with the Social Media: Student Teachers' Perceptions on Twitter in a Debate Activity. *New Approaches in Educational Research*, 4(1), 46-53. <https://doi.org/10.7821/naer.2015.1.102>
- Van-Dijk, J. (2011). Tracing Twitter: The Rise of a Microblogging Platform. *International Journal of Media and Cultural Politics*, 7(3), 333-348. https://doi.org/10.1386/macp.7.3.333_1
- Wesely, P.M. (2013). Investigating the Community of Practice of World Language Educators on Twitter. *Journal of Teacher Education*, 64(4), 305-318. <https://doi.org/10.1177/0022487113489032>
- West, B., Moore, H., & Barry, B. (2015). Beyond the Tweet: Using Twitter to Enhance Engagement, Learning, and Success among First-year Students. *Journal of Marketing Education*, 37(3), 160-170. <https://doi.org/10.1177/0273475315586061>