

Study on the possibilities for development of the personal learning network (PLN) in a degree course with large numbers of students

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Abstract

This paper presents a study of the creation and development of personal learning networks (PLNs) in an educational technology course with 233 3rd year students on the Degree in Primary Teaching course at the University of the Balearic Islands (UIB) in Spain. At the beginning, instructions were given to students to use different tools during the course and encourage the development of PLNs, particularly Twitter (with hashtags), e-portfolios and RSS feeds. Data collection was based on final student questionnaires and tweet collections in the hashtags for the course. The results point out that, although there were signs that a learning network was created within the face-to-face environment of the classroom, the creation of a significant PLN by the students beyond the tasks of the course could not be perceived online, since there were few further connections or interactions with other people and their personal learning environments (PLEs). Their network at this point was still based solely on their traditional connections, without going beyond the course. This led us to highlight the need for further work on strategies to empower the students' PLNs and make it possible to create significant and useful PLNs for their future professional development.

Keywords: Personal Learning Network (PLN), Twitter, sharing, e-portfolios, teacher training

Introduction

Personal Learning Networks (PLN) are not new. They have always existed, since we have always relied on other people - family, friends and acquaintances - to increase our knowledge of the world (Warlick, 2009). With the changing times, access to more information and rapid evolution of ICT technologies, it seems to be imperative for teachers to take advantage of these new tools to boost the construction and maintenance of the PLN, both for themselves and their students, especially for future teachers.

This study follows up previous work concerning the construction of the foundations of the PLE and PLN (Marín, Negre, & Pérez Garcias, 2014) and forms part of a broader teaching innovation project that was carried out during the 2013/2014 academic year on the Primary Teacher's Degree course at the UIB. Its main objective was to boost integration of social communication tools in learning-teaching processes in order to develop learning strategies based on content creation, communication and information management online.

In this work we focus on the instructions that we gave our student teachers to facilitate the creation of PLNs and their creation and maintenance by the students during the first semester of the 2013/2014 academic year, mainly using Twitter as the support tool for the process.

Background

The Personal Learning Network consists of the sum of connections with other people's personal learning environments (PLE), which at the same time we consider to be their tools and strategies for reading, reflection and relationships, that make up knowledge environments (Chatti, Schroeder & Jarke, 2012) and whose interaction produces the development and enabling of strategies for the actual PLE and, therefore, are central to learning and professional development (Couros, 2010; Downes, 2010; Sloep &

Berlanga, 2011). The idea of the PLN is that each person contributes their knowledge so that what is most important is not what each person has in their PLE, but the sharing of those resources. Therefore, we also consider that “learning is the continuous creation of a personal knowledge network” (Adell & Castañeda, 2013:38).

The purpose of creating, developing and maintaining a PLN is a personal decision which depends on their individual learning and professional development needs, goals and plans. So the network provides opportunities for broadening learning beyond formal means, through problem solving, exploration of ideas and sharing tips and experiences. All this stimulates increasing reflection and growth in professional experience as part of a collaborative network (Couros, 2010). The people that each person is connected to in their PLN, and the information resources that they provide, are what provide the parameters that guide personal learning. Therefore, not only do PLNs open doors to sources of information that were not even available a few years ago but also to continually evolving technologies, and the connections facilitated by them are making it easier to capture and control the resulting information overload (Warlick, 2009).

According to Warlick (2009), there are three main types of PLN:

- Personally maintained synchronous connections. These consist of the traditional network each person consults to ask questions and search for advice, etc.
- Personally and socially maintained semi-synchronous connections. Usually refers to an interaction where a person sends out messages to a community of people who, because of their interest or expertise, could help him/her to solve some question or problem or just improve his/her performance at work. This does not necessarily have to happen in real time.
- Dynamically maintained asynchronous connections. In this case, the connection is more between valuable content sources than directly with people (as in the two other types). The main tool for this type of PLN is the RSS aggregator for connecting information from different sources.

Nowadays, all these types of PLN are enhanced by the use of different tools like chats, instant messaging, videoconferencing, social networks and virtual worlds.

Out of other social tools, Twitter is one of the most used for developing the PLN and also at an educational level, as can be appreciated in numerous, different experiences and other considerations, such as:

- Exploratory study on the use of Twitter as a Teacher Training tool in the Faculty of Education at the University of Murcia (Bernal, Cascales, Clemente & Izquierdo, 2012).
- Different educational experiments with students in the Faculty of Teacher Training at the University of Extremadura (Fernández, Revuelta & Sosa, 2012).
- Serendipitous learning (“learning through gaining new insights, discovering unrevealed aspects and recognizing seemingly unrelated connections”) through micro blogging, especially Twitter (Buchem, 2011).
- Study on the uses of Twitter in 20 Spanish-American universities (Guzmán Duque, del Moral & González Ladrón de Guevara, 2012).
- Twitter stories about networking and learning (Castañeda, Costa & Torres-Kompen, 2011).

Also, other authors, such as Lewis and Rush (2013) and Smith Risser (2013) consider that novice teachers may find the opportunity to build a network in Twitter where they can ask for help, discussion and mentoring outside a formal context, and therefore the use of Twitter is a support for constructing a practical community for the professional development of academic staff.

Following the types of social media users identified by Brandtzaeg (2012), we considered adapting the five user types for Twitter, as the social media tool we used in this educational experiment:

C1/user type 1 - Advanced Users	C2/user type 2 - Debaters	C3/user type 3 - Socialisers	C4/user type 4 - Lurkers	C5/user type 5 - Sporadics
Frequent use and in different contexts (formal, informal).	Active in discussions and debates.	Main use for social activities with friends, family and others.	Passive use for reading or reviewing others' contributions.	Low frequency of use.

Table 1. Types of social media users identified by Brandtzaeg (2012).

These types are related to the idea of the students' activity or passivity in content creation using social media. The idea of prosumer, the user as a creator while at the same time being a consumer (Hilzensauer & Schaffert, 2008), was to be boosted throughout the course and therefore, in particular, the desirable user types to be developed were C1 and C2.

The study

Context

The study was conducted in an educational technology course taken by 233 3rd year students on the Primary Teacher's Degree course at the University of the Balearic Islands (UIB) in Spain during the 2013/2014 academic year. They are divided into three different groups with three different lecturers. The main objective of this course ("Technological media and resources for primary education") is that students develop skills in the use of technology that will enable teaching and learning processes at school.

During this course, students must do their learning activities based on the creation of technological resources for primary education (for example, a video, interactive multimedia material, a podcast...), include them in their e-portfolio, and then share their creations or products with their classmates on Twitter with a hashtag (#) related to their group in the course. The methodological strategy for the course promotes content creation while simultaneously giving independence to the student, who chooses the tools that are the most appropriate to meet the needs of the activity and the most useful (Marín, Negre & Pérez Garcias, 2014).

At the beginning of the course, a workshop was carried out to set up each PLE. Students were asked to use the Symbaloo tool to gather their usual (formal and informal) learning places together and also to subscribe to information pages via RSS.

In addition, at this point, they were also given instructions to work with Twitter. Students were asked to create or, in the case that they already had an account and they preferred to do so, reuse their Twitter account. Some framework instructions given after the creation of their Twitter account were as follows:

- Add a picture or photo to the profile and complete your description.
- Join the Twubs for the group. In the previous experience from the 2012/2013 academic year, students experienced problems because of the time that Twitter takes to index new users (and their tweets), so we decided to solve this technical problem by using the Twubs service to collect all the tweets entered within the course hashtag (Marín, de la Osa & Pérez Garcias, 2014). In addition, for the students who had no previous experience using Twitter, Twubs is far easier to use, since the hashtag is already incorporated after joining to the group. We also embedded the service widget to enhance the tweets' visibility in the institutional Moodle-based virtual learning environment (VLE), where students had access to the course learning materials.

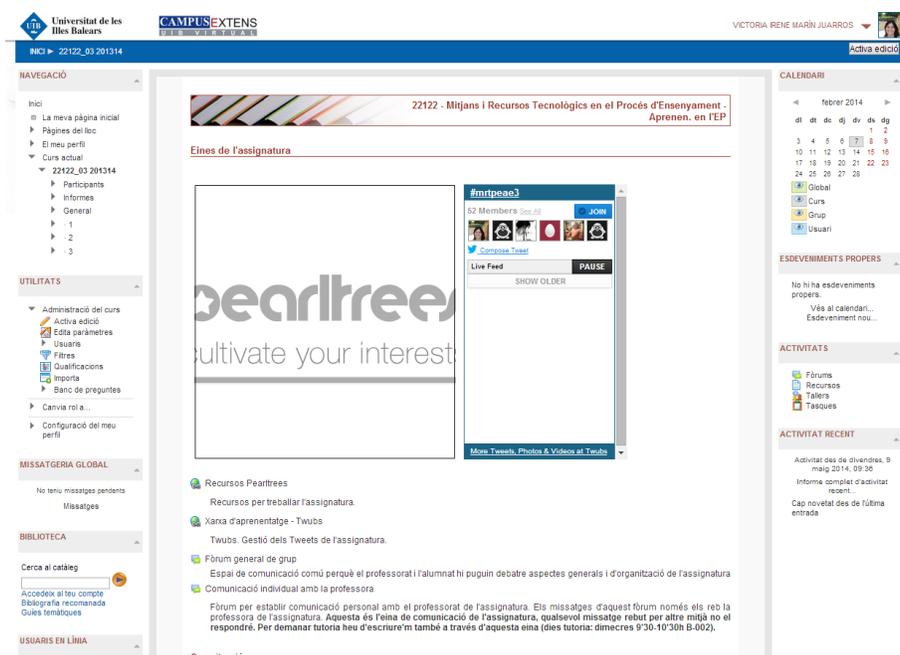


Figure 1. View of the VLE with the Twubs widget.

- Say hello to the class by sending a first tweet using Twubs.

- Follow the lecturer and your classmates by clicking on their Twitter profiles.
- Follow primary teachers or other teachers. At this point, they were given a link to a Twitter open course to find some suggestions.

Apart from these instructions, a link with more information about the use of Twitter by a Twitter client, and from a mobile device, and a brief Twitter user guide were provided for the students.

After these instructions for Twitter, they were asked to set up their e-portfolio, choosing which tool to use (blog, website, etc.), where they would be sharing their work and reflecting on associated learning. At this point, they were encouraged to add a classmate's e-portfolio to their RSS subscription list in Symbaloo and to visit each other's e-portfolios regularly and comment their work.

Therefore, using this methodology we considered enhancing the creation and/or growth of the three types of PLN with people they traditionally consult (classmates, teachers, friends), with a broader community of teachers and other educational stakeholders and with information sources.

Methodology

The data collection instruments were based on the collection of tweets in the hashtags set up for each group of students on the course and final questionnaires to students, which contained items relating to the construction and characteristics of the personal learning network for each student.

To study the development of the students' PLN we took various tools into consideration:

- Twitter as a networking tool during the course,
- E-portfolios, specifically comments and follow up on other classmates' works, teachers and experts, etc., and

- Other connection tools that could be used by students, both for internal (classmates and the three lecturers) and external (other teachers, friends, acquaintances, organizations, etc.) connections, for example RSS.

We used the Twitter Archiving Google Spreadsheet (TAGS) developed by Hawksey (2013) to collect tweets. This allowed us to collect all the tweets from each specific hashtag in the selected period of time on a Google Spreadsheet (Google Drive) and obtain some basic statistical data on the participants, their tweets and their interactions, always within the context of this specific hashtag. After collecting the tweets, they were analysed in order to assess their function and interactions.

The items in the questionnaire relating to the tools mentioned above for development of the students' PLN were the following:

- Do you think you have created (or broadened) a personal learning network on this course? Yes/No.
- If affirmative, which contributions do you consider you have made to your personal learning network? And which contributions do you consider that your personal learning network has made to you?
- If negative, why haven't you created (or broadened) your personal learning network?
- Which type of Twitter user do you consider yourself to be depending on your activity level? (according to the Brandtzaeg, 2012, classification)
- How many people do you follow on Twitter?
- Specify the profile types of the people that you follow (famous people, friends, classmates, teachers, etc.).
- Have you made any comments in a classmate's e-portfolio?
- Have you received any comments on your e-portfolio? (classmates or from outside)
- Have you used RSS subscriptions to follow sites, blogs, etc.? (apart from the initial workshop)

Results and discussion

166 students (71% of the total of 233 students), answered the questionnaire. Out of these students, most of them were women (74%), under 24 years old (75%) and not in employment (70%).

Twitter as a networking tool

Students mostly considered themselves to be Twitter users within the Lurkers and Sporadics range (69%), as can be seen in the graphic below. Therefore, the majority have a passive user profile in content creation using this specific social media tool.

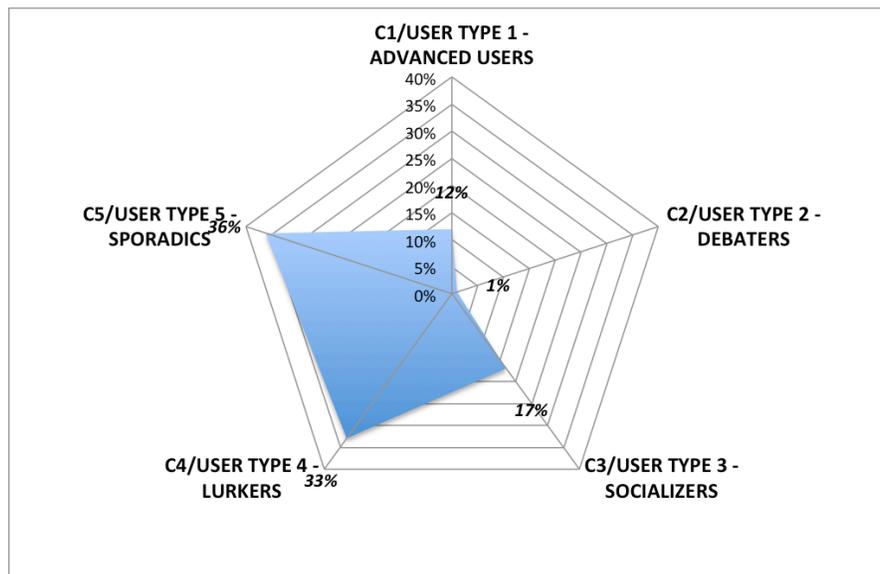


Figure 2. Twitter user type results from the students' questionnaire.

The number of people followed by the students is mostly under 100 (69%). These people are basically friends (26.84%), classmates (25.95%) and famous people (12.96%). The values for other profiles more related to their studies, such as teachers or educational organizations, are quite low (3.02% and 3.32%), so their use of Twitter seems to be essentially informal.

However, 93% of the students who answered the questionnaire asserted that they had created (or broadened) their personal learning network during the course.

1665 tweets from 218 students (94% from the total, n=233) and other external agents (teachers from other universities, family and friends of the students) were collected. 1582 out of the total of 1665 tweets were from the students on the course.

The average tweets per student was 7, although there were users with only 1 tweet and two users with 17 tweets, so the dispersion range is high.

Concerning tweet use, the majority of them (n=1339, 85%) were devoted to sharing learning activities done during the course in the students' e-portfolios. After that there are 14% (n=227) based on informal communication, such as greetings, comments, doubts. Finally, the remaining 1% (n=16) was dedicated to share resources of interest for the students of the course. Most of them were re-tweets of resources shared, mostly, by the s of the course. Their resources were, basically, educational videos and articles related to topics related to the course.

Looking at interactions (re-tweets and mentions), a total of 52 tweets were collected. 63% of them (n=33) were between the same students, mostly indicating that a student has done their learning activity with another student. The remaining 37% (n=19) were from lecturers of the course and outsiders, and they mostly were re-tweets of shared resources.

It is noteworthy that there was no communication between the different groups on the course via Twitter and also sending tweets was mostly unidirectional.

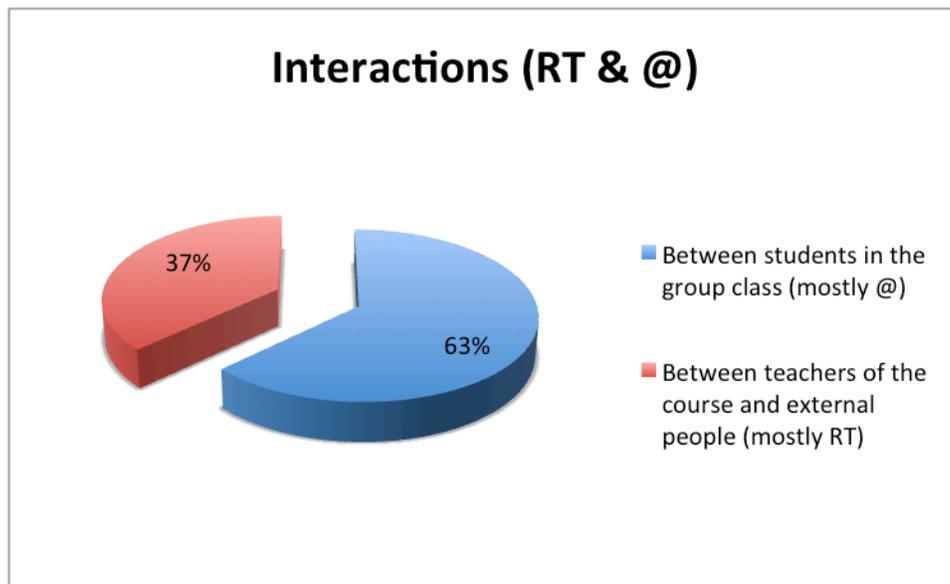


Figure 3. Interactions within the course hashtags

Contributions of and to the PLN

When it comes to contributions made by students to their PLN, they mention: sharing their opinions and work (40%), acquiring new tools for teaching (26%), informing their classmates how to do the tasks (12%), increasing their use of new technologies (12%), observing other opinions and projects (4%) and increasing communication between classmates (2%).

Regarding the contributions the PLN had made to each student, they remark: learning to use programs and platforms (28%), observing different opinions and ways of doing a single task (22%), considering improving their tasks and knowledge (21%), improving communication between classmates (8%), improving course organisation (6%), valuing the ICT more than before the course (5%).

On the other hand, when it comes to answers relating to not having created a PLN in the course, non-existent communication between students (4 answers), lack of time (2 answers) and useless classmates' comments (1 answer) are noteworthy.

E-portfolios and RSS

Regarding the questions about commenting other classmate's e-portfolio, 28.3% state that they made some comment on another classmate's e-portfolio, as against 71.1% that did not. This is almost exactly the same as the answer to the question "Have you received any comment on your e-portfolio?" (which also included comments from outsiders, since the e-portfolios were shared publicly via Twitter), that 27.1% said that they had received comments on their e-portfolio and 72.3% did not.

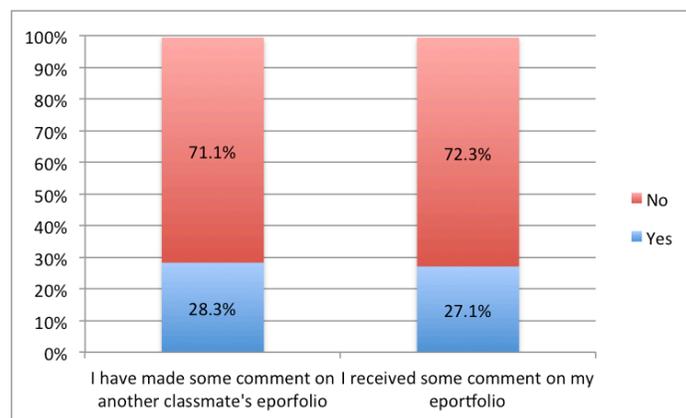


Figure 4. Answers relating to e-portfolio comments.

For the use of RSS subscriptions, apart from the ones done during the workshop, most of the students indicated that they had used them (63%) whereas 36% did not use RSS subscriptions.

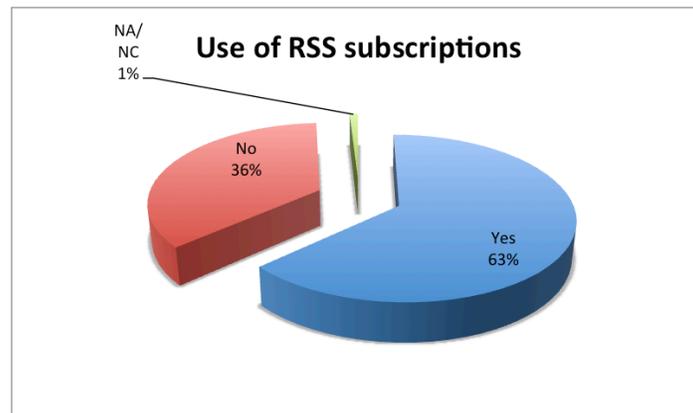


Figure 5. Answers relating to the use of RSS subscriptions.

Discussion

The results point to the fact that the students used Twitter to share new activities on their e-portfolios with others and to glance at others' e-portfolios. On the other hand, although there were signs that a learning network was created within the face-to-face environment of the classroom, students' creation of a significant PLN beyond the tasks of the course could not be perceived online, since there were few further connections or interactions with other people and their personal learning environments (PLEs). Furthermore, the coinciding percentages in the answers relating to commenting on e-portfolios make us think that these comments were also within the context of the class. Therefore, it should also be considered that, since the course was mainly face-to-face with some online support and work, connections are mostly based on in-person interactions and online evidence that was not perceived could have been face-to-face based.

Therefore, from the data collected, the type of PLN created and maintained in most cases was the one relating to traditional networks (personally maintained synchronous connections), whereas the other two types were rather underdeveloped. This coincides with our previous work (Marín, Negre & Pérez Garcias, 2014).

As the results for the type of Twitter user show, the students mostly had a passive user profile for content creation using this particular social media tool, and its use seemed to lack any educational aims and, instead, was directed at networking with friends and famous people (as the profile of people followed in Twitter by the students shows). Nevertheless, it is possible that using other social media tools (e.g. Facebook) they had a more active role and developed a PLN beyond the context of the class.

Conclusions

The results lead us to highlight the necessity of working further on strategies to empower students' PLN and making it possible to create significant and useful PLN for their future professional development. Although this time we gave them further instructions on beginning to develop their PLN beyond the class and solved the technical problems with respect to the previous experiment, the framework is still not sufficient to encourage development of learning networks.

As Warlick (2009) states, "Personal learning networks may open up new worlds, but the technologies that extend our personal and professional learning beyond our immediate proximity can be difficult to understand and control". Taking this into account, more frameworks for using technologies that enhance and extend PLNs should be considered.

On the other hand, it would be relevant to explore students' roles in face-to-face interactions, and in other social media tools, and find out if there are significant differences in PLN development, since each person probably has their own strategies and tools in their PLN to roll out its creation beyond formal learning. Although some framework for using Twitter was provided at the beginning of the course, it was possible that some students were unfamiliar with it and therefore overwhelmed by the amount of tweets not related to education (Lin, Hoffman & Borengasser, 2013).

Another aspect that should be considered is the way lecturers use and collaborate on Twitter, since some authors state that this use can foster students' engagement and

improve outcomes (Conole & Alevizou, 2010; Junco, Elavsky & Heiberger, 2013; Junco, Heiberger & Loken, 2011; Kassens-Noor, 2012). In this regard, other kinds of learning activities should be promoted to enhance and take advantage of the possibilities of this particular social media tool.

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References

- Adell, J. & Castañeda, L. (2013). El ecosistema pedagógico de los PLEs. In L. Castañeda & J. Adell (Eds.), *Entornos Personales de Aprendizaje: Claves para el ecosistema educativo en Red*. (pp. 29-51). Alcoy: Marfil. Available at: <http://digitum.um.es/xmlui/bitstream/10201/30409/1/capitulo2.pdf>
- Bernal, A. et al., 2012. El uso de Twitter como herramienta de formación del profesorado en la facultad de educación de la Universidad de Murcia. In *I Congreso Nacional de Investigación e Innovación en Educación Infantil y Primaria*. Murcia.
- Brandtzaeg, P.B., 2012. Social Networking Sites: Their Users and Social Implications - A Longitudinal Study. *Journal of Computer-Mediated Communication*, 17(4), pp.467-488. Available at: <http://doi.wiley.com/10.1111/j.1083-6101.2012.01580.x>
- Buchem, I., 2011. Serendipitous learning: Recognizing and fostering the potential of microblogging. *Formare. Open Journal per la formazione in rete*, (74). Available at:

<http://formare.erickson.it/wordpress/it/2011/serendipitous-learning-recognizing-and-fostering-the-potential-of-microblogging/>.

- Castañeda, Linda; Costa, Cristina and Torres-Kompen, Ricardo (2011) The Madhouse of ideas: stories about networking and learning with twitter. pp. 1-13. In: Proceedings of the The PLE Conference 2011, 10th - 12th July 2011, Southampton, UK.
- Chatti, M.A., Schroeder, U. & Jarke, M. (2012). LaaN: Convergence of Knowledge Management and Technology-enhanced Learning. *IEEE Transactions on Learning Technologies*, 5 (2), 177-189. DOI: <http://doi.ieeecomputersociety.org/10.1109/TLT.2011.33>
- Conole, G. & Alevizou, P. (2010) *A literature review of the use of Web 2.0 tools in Higher Education*, The Open University, Milton Keynes, UK [online] Available at: http://www.heacademy.ac.uk/assets/EvidenceNet/Conole_Alevizou_2010.pdf
- Couros, A. (2010). Developing Personal Learning Networks for Open and Social Learning. In G. Veletsianos (Ed.), *Emerging Technologies in Distance Education*. (pp. 109-128). Canada: AU Press, Athabasca University.
- Downes, S. (2010). Learning Networks and Connective Knowledge. *Collective Intelligence and ELearning 20 Implications of Web Based Communities and Networking*. (pp. 1-26). IGI Publishing. <http://dx.doi.org/10.4018/978-1-60566-729-4.ch001>
- Fernández, M.R., Revuelta, F.I. & Sosa, M.J., 2012. Redes sociales y microblogging: innovación didáctica en la formación superior. *RELATEC*, 11(1), pp.61–74.
- Guzmán Duquea, A.P., del Moral, M.E. & González Ladrón de Guevara, F., 2012. Usos de Twitter en las universidades iberoamericanas. *Relatec*, 11(1), pp.27–39.
- Hawksey, M. (2013) 'Twitter Archiving Google Spreadsheet TAGS v5', *MASHe*, [online] Available at: <http://mashe.hawksey.info/2013/02/twitter-archive-tagsv5/>
- Hilzensauer, W., & Schaffert, S. (2008). On the way towards Personal Learning Environments: Seven crucial aspects. *Elearning Papers*, 9. Retrieved from http://www.elearningpapers.eu/en/elearning_papers
- 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*, vol 44, no.2, pp. 273-287.
- Junco, R., Heiberger, G. & Loken, E. (2011) 'The effect of Twitter on college student engagement and grades', *Journal of Computer Assisted Learning*, vol. 27, no. 2, pp. 119–132.

- 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*, vol. 13, no. 1, pp. 9–21.
- Lewis, B. & Rush, D. (2013), 'Experience of developing Twitter-based communities of practice in higher education', *Research in Learning Technology* 2013, 21: 18598.
- Lin, M.F, Hoffman, E.S. & Borrengasser, C. (2013). Is social media too social for class? A case study of Twitter use. *TechTrends*, 57 (2), 39-45. doi: 10.1007/s11528-013-0644-2
- Marín, V. I., Negre, F., & Pérez Garcias, 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*, 21(42), 1–8. doi:10.3916/C42-2014-03
- Marín, V. I., de la Osa, T., & Pérez Garcias, A. (2014). A Methodological Strategy focused on the Integration of different Learning Contexts in Higher Education. ACM Digital Library. IDEE'14 Proceedings, June 9, 2014, Albacete, Spain.
- Rajagopal, K. et al., 2012. People in Personal Learning Networks: Analysing their Characteristics and Identifying Suitable Tools. In V. Hodgson et al., eds. *Proceedings of the Eighth International Conference on Networked Learning 2012*. Maastricht, The Netherlands, pp. 252–259. Available at: <http://hdl.handle.net/1820/4224>.
- Sloep, P. & Berlanga, A. (2011). Redes de aprendizaje, aprendizaje en Red. *Comunicar*, 37, 55-64. DOI: <http://dx.doi.org/10.3916/C37-2011-02-05>
- Smith Risser, H. (2013) 'Virtual induction: A novice teacher's use of Twitter to form an informal mentoring network', *Teaching and Teacher Education*, vol. 35, pp. 25-33.
- Warlick, D. (2009). Grow Your Personal Learning Network: New Technologies Can Keep You Connected and Help You Manage Information Overload. *Learning & Leading with Technology*, 36(6), 12-16.