

A View on Personal Learning Environments through Approaches to Learning

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OVERVIEW

In the past years the impact of social media in students in Higher Education has been remarkably significant (Pew Research Center, 2010; Tapscott, 2009). In order to exploit the potential benefits of these tools on education, we carried out different experiments using wikis and private social networks. Although the results were positive, we decided to move towards a more open approach using tools not directly linked to educational purposes. This paper reports on an experience in the use of Personal Learning Environments (PLE) to develop competences needed by students for lifelong learning. PLE is a concept that refers to the set of tools, devices, connections and networks that we used to learn. Nowadays building a digital PLE is key to achieve the goals set by the European Union.

The main objective of the paper is to analyse the influence of the approaches to learning of students in the reported effects of the PLE as well as in relevant aspects of the learning process.

245 students enrolled in a course on International Accounting participated in the experience of developing their own digital PLE. Some of the activities proposed used social networks, Twitter, blogs and wikis. The data were gathered through a web based questionnaire in two steps: 1) to obtain a priori self-confidence measures regarding communication in academic tasks and web related tasks, and 2) to obtain a measure of the approaches to learning of the students and self-confidence measures.

According to students' opinion, the experience was deemed as positive. In order to check the relationships between the impact of the experience and the approach to learning of students, a cluster analysis was performed. Students were classified into two groups. The cluster #1 presents lower scores on deep approach and higher scores on surface approach than students classified into cluster #2. Comparing the scores obtained in all the aspects of learning between the two groups, many differences arise. Students in the deep approach group indicated a significant higher impact in all measured aspects.

Results suggest that certain a type of students, more flexible and likely to manage information in their own, is able to use PLEs more effectively to learn than those who present a more pragmatic orientation focussed on passing the course.

KEYWORDS *Learning Approaches, Social Media, Personal Learning Environment*

INTRODUCTION

Social Web or Web 2.0 has become very popular in the last years, particularly among new generations that use this type of tools (such as social networks) on a daily basis. For example, the Pew Research Center (2010) reported that 95% of “Millennials” in the United States (generation born between 1977 and 1992) go online and that 83% use Social Networking Sites. In Spain, the AIMC’s survey on Internet users “Navegantes en la red” (October-December 2011) reports some facts and figures that describe the context of the educational experience that we analysed in this paper:

- Increase in the use of smartphones and tablets, geolocalized services and cloud computing applications.
- 68% of respondents accessed a social network the day before.
- Use of different social networks: Facebook 90%, Twitter 37%, Tuenti 25%, Google+ 25,5%.
- Main uses of social networks: friendship relationships 84%, hobbies 37%, professional relationships 32%.

Social software or Web 2.0 services are remarkably effective in connecting people and in facilitating the exchange of information, providing new opportunities for improving the acquisition of transversal competences in higher education. The European Commission (2008) highlighted the need for integrating Information and Communication Technologies (ICT) in all levels of education in order to support lifelong learning and innovation.

According to Elson Szeto (2000) innovation arise as a result of combining enhanced technology and improved methodologies. Particularly the Baldrige National Quality Program (2006) indicates in its *Education Criteria for Performance Excellence* that innovation is defined as “making meaningful change to improve an organization’s processes and services and creating new value for the organization’s stakeholders”. Within this

framework, the educational experience we analyse is intended to generate a better performance in the academic results of students through the use of information technologies that fit personal needs and interests. Arquero and Romero-Frías (2013) reported a positive impact of Social Web Services on higher education.

This paper pursues two objectives: (1) to analyse the impact of Personal Learning Environments in relevant aspects of the learning process; and (2) to test the existence of differences in the reported impact due to the approach to learning taken by the student and relevant self-confidence measures. As Arquero et al. (2010) indicate, the main studies on approaches to learning (Marton and Saljo, 1976; 1984) show two basic approaches to learning that may be adopted by students: “deep” and “surface” approaches. A student taking a deep approach tries to make sense of what is to be learnt in terms of ideas and concepts. In this case, the student’s conception of learning is ‘understanding’. In contrast a student adopting a surface approach conceives what is to be learnt as a series of unconnected facts that need to be memorised. The student’s conception of learning is ‘reproducing’.

Once set up the objectives and the theoretical framework the project, the next sections contextualized the Personal Learning Environments as an alternative to Learning Management Systems and then describe the experience carried out. The method section provides details of the sample and the instruments used to capture the variables studied in the article. Finally results are presented and discussed.

PERSONAL LEARNING ENVIRONMENTS AND LEARNING MANAGEMENT SYSTEMS

Supported by social practices and by institutional recommendations, we decided to use Web tools to improve an offline course on International Accounting by establishing a space to create, share and connect all type of content and relationships. Currently the most extended way to incorporate Internet into education is through the use of Learning Management Systems (LMS). LMSs, such as Moodle or Blackboard, are fully seated in educational institutions. Most universities have one or more of these systems as instruments to deliver virtual courses or to support offline courses. However, as mentioned before, the emergence of online tools, such as social networks, blogs, or wikis, facilitates new learning possibilities. LMSs are designed to facilitate management and administrative tasks done by teachers. However, the new generation of tools allows pedagogical designs based on creating and sharing contents and connections in the open environment of the Web.

Some authors (Brown and Adler, 2008) pointed out that LMSs do not fulfil all the expectations given to them. For example, Atwell (2007) indicates that learning design is usually more focused on the institution or the course rather than on improving students' learning. Also LMSs constitute closed environments that many times are used to provide contents, replicating the traditional offline system, without generating opportunities to acquire competences and knowledge from experience and interaction with informal learning spaces (emergent learning).

In order to solve these problems we decided to adopt a different approach to incorporate Web tools to education, the Personal Learning Environment (PLE). A PLE can be defined in different ways. Atwell (2007) indicates that a

PLE is not an application, but "is comprised of all the different tools we use in our everyday life for learning". Nowadays, many of these tools are social online services. Basically, a PLE is a concept that refers to the set of tools, devices, connections and networks that we use to learn. Social software (Redecker et al., 2010) is considered to be effective in developing essential skills (selecting relevant information, critically interpreting and analysing the socio-cultural context, working collaboratively, sharing knowledge, etc.). The development of a PLE integrating Web 2.0 tools allows students to face the real world context by exploring services that could be re-used for personal and professional purposes after the end of the formal education period. The development of a PLE could contribute to achieve the purpose of lifelong learning.

PLEs, instead of LMSs, allow the subject:

- To use for learning purposes tools that are generally used, in daily basis, for social purposes (i.e. Twitter, blogs, social networks, etc.).
- To create a sustainable environment for lifelong learning that goes beyond the formal educational period at the university (Atwell, 2007).
- To develop the student's own digital reputation (personal branding) to facilitate employability.

DESCRIPTION OF THE EXPERIENCE

By definition a PLE is personal, however we proposed the students to explore a set of commonly used web tools that are aimed to achieve different objectives (see the table below). Students could use their own profiles if they already had presence in the different types of tools (for example, students with a personal blog didn't need to create a new one).

Tool	Type	Use	Activities included in the final evaluation	Assessment
Facebook	Social Network	We set a private group to communicate and coordinate activities in the course.	-	-
Twitter	Microblogging	To disseminate information and to interact with other users.	To search and disseminate information using a particular hashtag #NCI2011.	5%
Blog	Publishing platform	To create content with a critical point of view.	To write two critical articles in the own student's blog on business issues.	10%
		The teacher's blog was used to publish activities and materials for the course.	To write a short essay about the use of the PLE.	5%
Descuadrando.com (open encyclopaedia on business)	Wiki	To create content with a neutral and objective point of view.	To write two encyclopaedia entries.	10%

Table 1 Commonly used web tools

In addition to the activities indicated in the table, the students had to do a final exam (70% grade). Other tools such as Slideshare or Google Docs were used during the course.

METHOD

Sample

The sample is composed of 245 students enrolled in International Accounting, an elective subject taught at the Business & Administration Degree. The vast majority of students (87%) were enrolled in the business degree, the rest in the joint degree of law and business. Most students are enrolled in high courses, more than 75% in 3rd and 4th courses. By gender, the composition of the sample is 37% male, 63% female. Students' age ranges from 19 to 32 years old, with a mean of 19. Valid questionnaires were obtained from 168 students.

Instruments

The data were gathered through a web-based questionnaire in two steps. The first set of questions was designed to obtain *a priori* self-confidence measures regarding communication in academic tasks (6 items) and tasks related to

tools (14 items). These questions were designed to be answered from 0, no confidence at all, to 10 total confidence, being 5 just acceptable.

The first instrument also included the N-SPQ 3f, a questionnaire designed to measure the approaches to learning of the students. This instrument is a modification of the reduced version of the SPQ-3f by Fox, McManus and Winder (2001) adapted by Fernández Polvillo and Arquero (2011).

This first part of the questionnaire was distributed during the first week of the course. The second set of questions is based on the instrument used by Arquero and Romero-Frías (2013) and was designed to obtain information on the impact of the innovation in relevant aspects:

- Active learning (7 items)
- Collaborative learning (11 items)
- Content learning (4 items)
- Communication skills (4 items)
- Critical thinking (3 items)
- General assessment (4 items)

The questions are to be responded in a 5 points Likert scale from 1 total disagreement to 5, total agreement, being 3 the neutral point. Scores on individual items were used to build additive scales for each aspect assessed. In order to allow comparisons, those scales range from 1 to

5. This part of the questionnaire was delivered once the course was ended.

RESULTS

The majority of students had previous contact with the tools. For example, 95% indicated that they had a Facebook account before the course, and close to 50% access this account at least once a day. This percentage rises to 96% when the question points to the Internet in general terms.

The relevance of laptops and mobile devices is increasing: 92% of students have a laptop and 52% a smartphone with Internet access.

Regarding the impact of the innovation in relevant aspects of the learning process, in general terms the experience was deemed very positive by students in all aspects covered in

the questionnaire. As table 2 shows, students reported a positive impact of the experience in all the aspects assessed.

The tools integrated in the PLE are expected to have a positive impact on collaborative aspects of learning. The results support this expectation (mean: 4). Analysing in depth the component of this score (table 3), students indicated a very positive impact due to the possibility of learning from other students: from the opinions and contributions and by getting questions solved by other students.

The second research objective aimed to investigate whether there was any influence of the approaches to learning of the students and the perceived effect of the innovation. In order to check these relationships a cluster analysis (k-means) was performed. Students were classified into two groups, according to their approaches to learning (table 4).

	Active learning	Collaborative learning	Communication skills	Content learning	Critical thinking	General assessment
Valid	168	168	168	168	168	168
Missing	77	77	77	77	77	77
Mean	3.8	4.0	3.6	3.7	3.8	3.9
Standard Deviation	0.7	0.5	0.6	0.7	0.5	0.7
t-test sig.*	.000	.000	.000	.000	.000	.000

* t-test comparing the mean against the neutral point (3)

Table 2 Impact of the innovation on learning - descriptive statistics

The tools used and activities developed...	Mean	Mode	Std. Dev.
- Helped us to solve questions and doubts about the subject to other students.	4.42	4	0.60
- Allow all the members of the class to benefit from the contributions and opinions made by the students.	4.39	4	0.62
- Make easier to approach the teaching staff to get questions and doubts about the subject solved.	4.38	5	0.72
- Allow sharing easily other interests (academic or personal) with other classmates.	4.21	4	0.74
- Help to the diffusion and sharing of our own ideas and points of view to the rest of the group.	4.15	4	0.69
- Facilitate the teamwork of the groups.	4.08	4	0.73
- Helped us to better communicate with the classmates.	3.92	4	0.83
- Helped us to learn from and consider the views and opinions of other students on a certain topic.	3.89	4	0.64
- Allow an easier coordination with other students for other activities out of the subject (i.e. tasks or papers for other subjects).	3.86	4	0.77
- Helped to get in touch with classmate that otherwise we could not meet.	3.60	4	0.91
- Helped to adopt a more proactive attitude opening links with classmates.	3.52	4	0.86

Table 3 Collaborative learning items - descriptive statistics

The cluster #1 (n: 64) presents low scores on deep approach and higher scores on surface approach than students classified into cluster #2 (n: 75). In general terms, students in cluster #2 present a more appropriate approach to learning in comparison with their counterparts.

	Cluster	
	#1	#2
Deep approach to learning	15.33	21.79
Surface approach to learning	14.33	11.10
Significance of differences	.000	.000

Table 4 Clusters

Comparing the scores obtained in all the aspects of learning between the two groups, many differences arise (table 5).

		N	Mean	Std. Dev.	t-test sig.
Active learning	1 surface	64	3.58	.74	.000
	2 deep	75	4.03	.46	
Collaborative learning	1 surface	64	3.91	.45	.000
	2 deep	75	4.19	.39	
Communication skills	1 surface	64	3.44	.62	.000
	2 deep	75	3.81	.56	
Content learning	1 surface	64	3.52	.71	.000
	2 deep	75	3.92	.55	
Critical thinking	1 surface	64	3.66	.58	.001
	2 deep	75	3.97	.45	
General assessment	1 surface	64	3.64	.84	.000
	2 deep	75	4.13	.53	

Table 5 Impact of the innovation on learning by cluster

Students in the deep approach group indicated a significant higher impact in all measured aspects. Therefore, students that present a more appropriate approach towards learning are also more likely to obtain a better result from innovations.

DISCUSSION

The main aim of this paper is to assess the impact of using Personal Learning Environments in an offline course on International Accounting. The PLE included a selection of digital tools that fits the learning subject's needs.

The results are indicative of a positive impact in all the aspects of learning measured. This impact is similar to the results obtained using specifically designed SNSs (Arquero & Romero-Frías, 2013) with the advantage that general-purpose tools are available outside the academic context and most of the students have previous experience (at least with some of them). This previous experience could act as a facilitator that allows obtaining similar results in comparison with specifically designed tools where students have no previous experience and, as are tools normally used by students, are more likely to be also used in the future for learning purposes.

Social media are an important part of the Personal Learning Environments of students. The study shows that the approach to learning adopted by the student could be a relevant factor to explain the academic results when this sort of activities are proposed. Deep approach students tend to consider the educational experience as having a higher impact in terms of acquisition of competences, and present higher levels of self-confidence in their own capabilities (especially in communication tasks). In this way they can have an active role in the learning process, not as a mere consumer of content.

The relationship between approaches and perception of the effectiveness of innovations has relevant implications. Ahmadi, Helms and Raiszadeh (2001) pointed out that students are asked to evaluate teaching and teachers in most universities throughout the world, being those evaluations used in promotion, tenure and merit decisions (Baldwind & Blattner, 2003). In Spain, such evaluations, inscribed in a "quality assurance" system rely heavily (when is not the only indicator) on assessment by students. Castro et al. (2012) compiled a series of papers on this matter. Entwistle and Tait (1990) found that students with contrasting approaches were likely to define effective teaching in ways that reflected their own orientations. Our results indicate that *a priori* approaches to learning of students have an impact on how they perceive and evaluate the effectiveness of teaching. Therefore, the same teacher, using the same methodologies could be assessed differently just depending on the orientations of students (factor that is beyond the control of the teaching staff), raising some doubts on the validity of any quality assessment that rely on such measures.

Further evidence on the impact of ICT in education is needed, particularly in the use of social software, personal learning environments and quality assurance in education.

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REFERENCES

- Ahmadi, M. & Helms, M.M. and Raiszadeh, F. (2001). "Business students' perceptions of faculty evaluations". *International Journal of Educational Management*, 15 (1): 12—22.
- Arquero, J.L., González, J.M., Hassall, T., Joyce, J., Germanou, H. & Asonitou, S. (2010). "The Approaches To Learning Of European Accounting Students". *EuroMed Journal of Business*, 5(3): 345-362.
- Arquero, J.L. and Romero-Frías, E. (2013). "Using social network sites in Higher Education: an experience in business studies". *Innovations in Education and Teaching International*. Available from: <http://dx.doi.org/10.1080/14703297.2012.760772>
- Attwell, G. (2007). "The Personal Learning Environments - the future of eLearning?" *eLearning Papers*, 2(1). [Consulted 29 January 2013] Available from: <http://www.elearningeuropa.info/files/media/media11561.pdf>
- Baldrige National Quality Program (2006). *Education Criteria for Performance Excellence*. The Baldrige National Quality Program at the National Institute of Standards and Technology in Gaithersburg, MD.
- Baldwin, T. & Blattner, N. (2003). "Guarding against potential bias in student evaluations: What every faculty member needs to know". *College Teaching*, 51 (1): 27—32.
- Brown, J.S. & Adler, R.P. (2008). "Minds on Fire: Open Education, the Long Tail, and Learning 2.0". *Educause Quarterly*, 42(6): 16-32.
- Castro, A.; Chocrón, A.M.; Fernández-Carrión, R. et al. (Eds.) (2012). *Calidad, evaluación y encuestas de la docencia universitaria* (Quality, assessment and students evaluations of teaching). Ed. Laborum.
- Elson Szeto, (2000). "Innovation capacity: working towards a mechanism for improving innovation within an inter-organizational network". *The TQM Magazine*, 12(2): 149 - 158
- Entwistle, N. & Tait, H. (1990). Approaches to learning, evaluations of teaching, and preferences for contrasting academic environments. *Higher education*, 19 (2): 169—194.
- European Commission (2008). *The use of ICT to support innovation and lifelong learning for all - A report on progress*. Brussels: European Commission. [Consulted 29 January 2013] Available from: <http://ec.europa.eu/education/lifelong-learning-programme/doc/sec2629.pdf>
- Fernández Polvillo, C. & Arquero, J.L. (2011). "Evaluación de Innovaciones y Enfoques de Aprendizaje. Presentación Preliminar de un Instrumento de Medida". En: Buitrago Esquinas, E. y Sánchez Franco, M.J. (editores): *Espacio Europeo de Educación Superior (EEES). Innovaciones Metodológicas en la Economía y la Empresa*, Edición Digital @tres, S.L.L., Sevilla, pp. 223-234.
- Fox, R., McManus, I.C. & Winder, B. (2001). "The shortened Study Process Questionnaire: An investigation of its structure and longitudinal stability using confirmatory factor analysis". *British Journal of Educational Psychology*, 71: 511-530.
- Marton F. & Saljo R. (1976). "On qualitative differences in learning - 1 Outcome and process". *British Journal of Educational Psychology*, (46): 4-11.
- Marton F. & Saljo R. (1984). "Approaches to learning", in Marton *et al* (Eds.) *The Experience of Learning*. Scottish Academic Press, Edinburgh.
- Pew Research Center (2010). *Generations 2010*. [Consulted 29 January 2013] Available from: <http://pewinternet.org/Reports/2010/Generations-2010.aspx>
- Redecker, C., Ala-Mutka, K., Bacigalupo, M., Ferrari, A. & Punie, Y. (2010) *Learning 2.0: The Impact of Web 2.0 Innovations on Education and Training in Europe* (Final Report). Institute for Prospective Technological Studies. European Commission. [Consulted 29 January 2013] Available from: <http://ftp.jrc.es/EURdoc/JRC55629.pdf>
- Tapscott, D. (2009) *Grown Up Digital: How the Net Generation is Changing Your World*. McGraw-Hill.

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