

Conde, M. Á., García-Peñalvo, F. J., Casany, M. J., & Alier Forment, M. (2013). Personal Learning Environments and the Integration with Learning Management Systems. In M. D. Lytras, D. Ruan, R. Tennyson, P. Ordoñez de Pablos, F. J. García- Peñalvo, & L. Rusu (Eds.), *Information Systems, E-learning, and Knowledge Management Research. 4th World Summit on the Knowledge Society, WSKS 2011, Mykonos, Greece, September 21-23, 2011. Revised Selected Papers* (Vol. CCIS 278, pp. 16-21). Berlin, Heidelberg: Springer Verlag.

Personal Learning Environments and the integration with Learning Management Systems[†]

M. Á. Conde¹, F. J. García-Peñalvo¹, M. J. Casany², M. Alier²

¹Computer Science Department. Science Education Research Institute (IUCE). GRIAL Research Group. University of Salamanca
{mconde, fgarcia}@usal.es

²Services & Information Systems Engineering Department, UPC - Campus Nord, building Omega, office 1116, 08034 Barcelona, Spain.
mjcasany@lsi.upc.edu, marc.alier@upc.edu

Abstract. eLearning is continuously evolving and must be ready to integrate new paradigms and consider the student as the centre of the process. This shift will mean changing the tools currently used, giving way to other tools that take into account the customization. These changes are expensive and should not think only of replacing all previously existing but should seek to integrate new initiatives with those of success. This will ensure learning environments really powerful and effective. In this paper integration initiatives will be review and a new one will be proposed.

Keywords: Learning Management System, Personal Learning Environment, 2.0 web-based tools, Personalization.

1 Introduction

Learning will be one of the key processes in any society, because it facilitates the evolution of the individual and in many cases it could be a social or business improvement for her. Furthermore, learning could be understood as a living process, constantly evolving. Hence its evolution is influenced by changes of a different nature, such as sociological, educational or technological [1]. Let us consider one of those changes, in particular, the application of technology to learning, which is known as eLearning.

One of the most representative tools in the field of eLearning are learning platforms, also known as Learning Management Systems

[†] This work was supported by Spanish Government projects TSI-020302-2009-35 and TIN2010-21695-C02-01 and by the Castile and Lion Regional Government through GR47 excellence project.

(LMS) or Virtual Learning Environments (VLE). Today, the LMSs are fully seated in educational settings [2, 3].

However, despite the acceptance they have, the LMS have not achieved the expected improvements [4]. Due mainly to the following reasons: 1) Learning should be focused on the user and not the institution or the course [5]. 2) It is necessary for learning environments give support to life long learning [6]. 3) It is essential to consider the informal learning and the support of 2.0 tools that promote this model of learning [7]. 4) Learning systems must be able to evolve with new technologies [8].

In order to solve these problems appear Personal Learning Environments (PLE). These new learning spaces are able to satisfy all new necessities but have to consider how to integrate formal, informal and non-formal tendencies. In this article we are going to study PLEs and different integration policies. In the first section the definition of Personal Learning Environment will be presented. The second will expose the different learning integration tendencies and finally some possible integration sceneries will be described.

2 Definition of PLE

PLE concept is something recent, but other concepts like personalization of learning in which they are based, not so. The concept emerge around 2001 [9] although does not take force until November 2004 when the title appears as part of the sessions of the JISC / CETIS Conference of that year.

From here there is a profuse contribution of different authors to what could become the definition of PLE. The definition of PLE is not easy and there is still debate about it, although they settled common ground. Among the possible definitions, could be a differentiation between those who stress the importance of the technological concept as central to the PLE and those that consider the pedagogical benefits of it.

From a technological point of view there are several definitions but here we are going to consider one of the most representative. "The PLE is not a piece of software. It is an environment where people where, people, tools, communities and resources interact in a flexible way "[10]. This author promotes an open environment to services and resources from multiple contexts, opened, bidirectional (not only consume services but are provided), customized to the user, that uses

lightweight standards and interfaces, collaborative and open content-oriented the person but also the community in which they covered.

From a pedagogical point of view could be considered Atwell between others. This author believes that a PLE should not be seen as a software application: "Personalized Learning Environments are not an application but a new approach to the use of new technologies in learning. There are still many unresolved elements. But in the end the discussion about the use of PLE is not technical but philosophical, ethical and educational. The PLEs provide students their own space to develop and share their ideas, through learning environments that connect resources and contexts so far apart [5].

There are many definitions of PLE, but this section does not attempt to review them but to clarify the concept to facilitate understanding of existing integration trends.

3 Integration Tendencies and proposal

The PLEs represent an opportunity for learning management seeking greater effectiveness in the process. But in any case they should be viewed as a substitute for the LMS [11]. The LMSs are tools fully established and should remain in the landscape of learning [12].

PLEs are going to open institutional walled-gardens [5] is therefore essential to establish solutions to integrate institutional and non institutional worlds, that is to say formal, non formal and informal learning.

But this will not be an easy task because, among other things, to: 1) the difficulties of the LMS to include interoperability standards [12]; 2) The integration of training activities in the PLE is not adequate because they are designed for representation, classification and tracking in other platforms [13]; 3) Problems of traceability of user activity in the PLE and, therefore, for consideration in the formal environment; [14] 4) single-sign-on implementation problems [15]; 5) Problems of information security [16].

In this situation, Wilson and others [10] proposed three possible scenarios for coexistence between LMS and PLE that would: 1) Existence of PLE and LMS in parallel, as formal and informal environments respectively. 2) The LMS open their structures to establish a means of interoperability with PLE. 3) Another possibility is

that the LMS include elements of the PLE. This latter scenario limits the transformative power of PLEs.

The first of the proposed scenarios will not consider the integration but the coexistence, and hence will not be discussed further in this paper.

The second scenario refers to the opening of the LMS through the inclusion of Web services and interoperability initiatives. In this scenario may be included: iGoogle based initiatives [17], social networks connected with LMS [18], the LMS that offer support for implementations of interoperability specifications [19], PLEs with specific communication protocols [20] or integration based on service-oriented architecture [21]. Main difficulties of these initiatives are institutional barriers to the opening of formal environments that focus on the export of information and not the exchange interaction.

The third scenario considers the integration of external tools into the LMS. With possibility user could not decide which tools he is going to use and they will be limited to institutional decisions. Some initiatives in this scenario could be: LMS defined for the integration of external tools [22], Google Wave Gadgets integrated into Moodle [23], PLE introducing tools based on analysis of logs[24], initiatives based on the integration of tools based on learning design [25], integration architectures[26], etc.

Considering the initiatives discussed above we have proposed one that uses Moodle web services layer, the different existing connectors (to export information and interaction) and a new one based on IMS-LTI (IMS Learning Tools for Interoperability) specification in order to import the activities outcomes. [27, 28]

4 Conclusions

As conclusions we have to take into account that PLEs provide us new possibilities in eLearning processes. 2.0 tools, social networks and so on are going to define the future of eLearning and must be included in our actual learning contexts.

That inclusion requires considering how PLE could be integrated with existing LMS and how interaction and information will be exchanged. In this sense there are several initiatives but none of them are providing efficient methods to guarantee full integration and interaction.

Considering this we have presented a possible solution that will not only facilitate integration but also promoted a model of PLE that is in between the institutional initiatives and the fully customized by the user.

References

1. García Peñalvo, F.J.: Preface of *Advances in E-Learning: Experiences and Methodologies*. Information Science Reference, Hershey, PA, USA (2008)
2. Prendes, M.P.: *Plataformas de campus virtuales de Software Libre: Análisis comparativo de la situación actual de las Universidades Españolas.*, pp. 228. Informe del proyecto EA-2008-0257 de la Secretaría de Estado de Universidades e Investigación (2009)
3. Wexler, S., Dublin, L., Grey, N., Jagannathan, S., Karrer, T., Martinez, M., Mosher, B., Oakes, K., Barneveld, A.v.: *LEARNING MANAGEMENT SYSTEMS. The good, the bad, the ugly,... and the truth.* The eLearning Guild (2008)
4. Brown, J.S., Adler, R.P.: *Minds on Fire: Open Education, the Long Tail, and Learning 2.0.* *Educause Quarterly* 42, 16-32 (2008)
5. Attwell, G.: *The Personal Learning Environments - the future of eLearning?* *eLearning Papers*, vol. 2, (2007)
6. Attwell, G.: *e-Portfolios – the DNA of the Personal Learning Environment?* *Journal of e-Learning and Knowledge Society* 3, (2007)
7. Ajjan, H., Hartshorne, R.: *Investigating faculty decisions to adopt Web 2.0 technologies: Theory and Empirical Tests.* *The Internet and Higher Education* 11, 71-80 (2008)
8. Mott, J., Wiley, D.: *Open for Learning: The CMS and the Open Learning Network.* In *Education - Exploring our connective educational landscape.* University of Regina, Saskatchewan, Canada (2009)
9. Brown, S.: *From VLEs to learning webs: the implications of Web 2.0 for learning and teaching.* Routledge (2010)
10. Wilson, S., Liber, O., Johnson, M., Beauvoir, P., Sharples, P., Milligan, C.: *Personal Learning Environments: Challenging the dominant design of educational systems* *Journal of e-Learning and Knowledge Society* 3, 27-38 (2007)
11. Adell, J., Castañeda, L.: *Los Entornos Personales de Aprendizaje (PLEs): una nueva manera de entender el aprendizaje.* In: Roig Vila, R., Fiorucci, M. (eds.) *Claves para la investigación en innovación y calidad educativas. La integración de las Tecnologías de la Información y la Comunicación y la Interculturalidad en las aulas. Stumenti di ricerca per l'innovazione e la qualità in ambito educativo. La Tecnologie dell'informazione e della Comunicaciones e l'interculturalità nella scuola.* Marfil – Roma TRE Università degli studi, Alcoy (2010)
12. Sclater, N.: *Web 2.0, Personal Learning Environments, and the Future of Learning Management Systems.* *Research Bulletin*, Boulder, CO: EDUCAUSE Center for Applied Research (ECAR) (2008)
13. Palmér, M., Sire, S., Bogdanov, E., Gillet, D., Wild, F.: *Mapping Web Personal Learning Environments.* In: Wild, F., Kalz, M., Palmér, M., Müller, D. (eds.) *Second International Workshop on Mashup Personal Learning Environments (MUPPLE09)*, vol. 506, pp. 31-46. CEUR-WS.org, Nize, France (2009)
14. Wilson, S., Sharples, P., Griffiths, D., Popat, K.: *Moodle Wave: Reinventing the VLE using Widget technologies.* In: Wild, F., Kalz, M., Palmér, M., Müller, D. (eds.) *Mash-Up*

- Personal Learning Environments - 2st Workshop MUPPLE'09, vol. 506, pp. 47-58. CEUR Proceedings, Nize France (2009)
15. Severance, C., Hardin, J., Whyte, A.: The coming functionality mash-up in Personal Learning Environments. *Interactive Learning Environments* 16, 47-62 (2008)
 16. Casquero, O., Portillo, J., Ovelar, R., Benito, M., Romo, J.: PLE Network: an integrated eLearning 2.0 architecture from University's perspective. *Interactive Learning Environments* ((in Press))
 17. Casquero, O., Portillo, J., Ovelar, R., Romo, J., Benito, M.: iGoogle and gadgets as a platform for integrating institutional and external services. In: Wild, F., Kalz, M., Palmér, M. (eds.) *Mash-Up Personal Learning Environments - 1st Workshop MUPPLE'08*, vol. 388, pp. 37-42. CEUR-Workshop Proceedings, Maastricht, The Netherlands (2008)
 18. Torres, R., Edirisingha, P., Mobbs, R.: Building Web 2.0-Based Personal Learning Environments: A Conceptual Framework. In: EDEN Research Workshop 2008. (Year)
 19. <http://www.imsglobal.org/cc/statuschart.html>
 20. Harmelen, M.v.: Personal Learning Environments. *Proceedings of the Sixth IEEE International Conference on Advanced Learning Technologies*, pp. 815-816. IEEE Computer Society (2006)
 21. Peret, Y., Leroy, S., Leprêtre, E.: First steps in the integration of institutional and personal learning environments. *Workshop Future Learning Landscape - EC-TEL 2010*, Barcelona, Spain (2010)
 22. Booth, A.G., Clark, B.P.: A service-oriented virtual learning environment. *On the Horizon*. 17, 232-244 (2009)
 23. Wilson, S., Sharples, P., Griffiths, D., Popat, K.: Moodle Wave: Reinventing the VLE using Widget technologies. In: Wild, F., Kalz, M., Palmér, M., Müller, D. (eds.) *Mash-Up Personal Learning Environments - 2st Workshop MUPPLE'09*, vol. 506, pp. 47-58. CEUR Proceedings, Nize France (2009)
 24. Verpoorten, D., Glahn, C., Kravcik, M., Ternier, S., Specht, M.: Personalisation of Learning in Virtual Learning Environments. *Proceedings of the 4th European Conference on Technology Enhanced Learning: Learning in the Synergy of Multiple Disciplines*, pp. 52-66. Springer-Verlag, Nice, France (2009)
 25. de-la-Fuente-Valentín, L., Leony, D., Pardo, A., Carlos Delgado Kloos, M.i.L.D.p.t.f.e., *Proceedings of the , Maastricht, The Netherlands, September 17, 2008: Mashups in Learning Design: pushing the flexibility envelope. First International Workshop on Mashup Personal Learning Environments (MUPPLE08)*, Maastricht, The Netherlands (2008)
 26. Alario-Hoyos, C., Wilson, S., *Proceedings of the Comparison of the main Alternatives to the Integration of External Tools in different Platforms. International Conference of Education, Research and Innovation, ICERI 2010., Madrid, Spain, November 2010* (2010)
 27. Alier, M., Casañ, M.J., Piguillem, J.: Shifting from a Learning Toolkit to a Open Learning Platform. In: M. D. Lytras, P.O.d.P., D. Avison, J. Sipiør, Q. Jin, W. Leal, L. Uden, M. Thomas, S. Cervai, D. G. Horner (ed.) *Technology Enhanced Learning: Quality of Teaching and Educational Reform. 1st International Conference, TECH-EDUCATION 2010., vol. CCIS 73*, pp. 1-10. *Communications in Computer and Information Science*. Berlin, Heidelberg: Springer., Athens, Greece. (2010)
 28. Conde, M.Á., García, F.J., Casany, M.J., Allier, M.: Open Integrated Personal Learning Environment: Towards a New Conception of the ICT-Based Learning Processess. In: Lytras, M.D., Ordoñez-De-Pablos, P., Ziderman, A., Roulstone, A., Maurer, H., Imber, J.B. (eds.) *Knowledge Management, Information Systems, E-Learning, and Sustainability Research. Third World Summit on the Knowledge Society, WSKS 2010*, vol. CCIS 111, pp. 115-124. *Communications in Computer and Information Science*. Berlin, Heidelberg: Springer, Corfú, Greece, September 22-24 (2010)