INTEGRATING PERSONAL AND INSTITUTIONAL VIRTUAL LEARNING ENVIRONMENTS

A. Bustos¹, A. Engel¹, A. Saz², C. Coll¹

¹ Universitat de Barcelona (SPAIN) ² Universitat d'Andorra (ANDORRA) abustos@ub.edu, anna.engel@ub.edu, asaz@uda.ad, ccoll@ub.edu

Abstract

The present project aims to introduce the use of Personal Learning Environment, PLE, in the educational practices at the Post-Graduate of Educational Psychology. Currently, this Post-Graduate program uses a Virtual Community as a platform for the promotion of the relationship between teachers and students from the several promotions of Master degree and Ph. D. The program also offers virtual classrooms to support the face-to-face sessions for mandatory subjects and for the complementary curricular activities. Our next step will be to add a new level between on-line classrooms and the virtual community and offering students the opportunity to build their own PLE.

The main objective of our proposal is related with the use of a PLE platform in order to promote innovation in the design of higher education environments. The design should offer more flexibility and possibilities to combine the institutional (formal) virtual environment with a more customizable environment that the students should configure following their interests and preferences. In this way, students could have more control over managing their own learning processes. Using PLE platform, our aim is to encourage students to explicit and share with other some resources, services and online applications even to share their own network learning whereby they participate in different educational and professional contexts.

In this proposal we describe the first phase of the Project. The main focus of this phase has been a pilot study in order to evaluate Elgg, an Open Source Social Networking Engine, as the technological platform to allow the students configuring their personal learning environments. We detail the overall design decisions regarding the selection and configuration of Elgg's tools or widgets for building PLE. From our perspective, PLE building should consider three different levels of resources or widgets: widgets for elaborating information, widgets for sharing information and widgets for publicizing information. The different widgets, at the three levels, should offer the possibilities to work in three levels of "activity": personal level, small group level and the whole community level. In short, from of our point of view, building a PLE suppose decide how to create, organize and maintain both the personal network of resources for learning as the persons from whom to learn at any moment.

Finally, we analyze the structure of the PLEs configured by a group of 16 students over a semester and the effective uses of the possibilities offered by the several tools. We contrast too these results with the assessment of the students themselves about their experience in configuring and using these environments for learning.

Keywords: Personal Learning Environment, Learning Ecologies, Higher Education, Elgg.

1 INTRODUCTION

Enhancing the role of students in the management of their own learning and in the acquisition of skills for learning to learn throughout their professional careers is undoubtedly one of the priorities of university education today. The information and communication technologies (ICTs) and the Internet play a decisive role in the acquisition and development of many of the new skills that students will need to successfully meet the challenges of the information society [1].

Personal Learning Environments (PLEs) allow students to build their own spaces on the net in accordance with their interests and preferences, in which they can organise all the resources and services they use to learn to access information and the network of people that serve as reference points in their learning ([2], [3], [4], [5], [6], [7]).

With the importance of social networks as resources for learning, PLEs are environments that combine individual learning spaces with collective spaces for learning in small groups and in multiple

communities. Moreover, PLEs allow interactions at different levels of privacy and publicity. A PLE's configuration could combine private individual spaces and individual spaces with access only for some participants or fully public, combined with collective spaces with access only for partners, only for some participants or fully public.

The review of studies of PLEs shows the coexistence of a wide range of approaches and experiences rooted in different theoretical and disciplinary traditions. Some papers focus almost exclusively on the characteristics of the tools and resources that make up the "personal (digital) environment" (e.g., [8], [9], [7], [10], [11]). Others emphasise psychopedagogical aspects deriving from the first part of the title – "personal learning" – and focus on helping learners to create and manage these environments as learning tools (e.g., [4], [2], [6]). However, beyond this distinction between technological and psychopedagogical aspects, there are at least two shared elements or features that are of particular interest when viewed from the perspective of education.

First, the theoretical base of PLE is a vision of the learner as an agent who seeks, creates, adapts, and disseminates content, a "prosumer" rather than a mere consumer of content or training programmes created by others (e.g., teachers or publishers), someone willing to set their own learning goals in response to their interests and determined to achieve them: in short, someone able to take control of their own learning, making decisions about what, how, when and where to learn at all times, and above all, who to learn with.

Second, the notion of PLEs takes a broad view of learning, and does so in two particular ways. On the one hand, it emphasises the need for permanent knowledge updates throughout the professional career and the need to adapt to the rapid and constant changes that characterise the digital age. On the other, it extends the learning processes in formal education settings to all contexts and systems that provide learning opportunities for people – family, work, cultural institutions, religious institutions, community activities, sports, leisure activities, hobbies, and so on. In this way, we can say that PLEs give expression to individuals' learning ecologies ([12], [13]).

With this view of learning and the learner, our proposal for innovation aims to use PLEs as a platform for the design of a more flexible university environment which combines the virtual institutional environment with one that students create and customise based on their own interests and preferences, thereby giving them greater control over their own learning processes. Via the use of PLEs we aim to help students to make explicit their particular learning ecologies and to share them with others: in other words, to present and share their online facilities, services and applications and the networks of personal relationships they use to learn in different educational and professional contexts.

In this paper we describe the first phase of this project. In this first stage we focus on the assessment of Elgg, an open source social networking platform, as a means to enable participants to create their own PLEs. In particular, we detail the decisions taken by designers in order to explain the selection and setup of the plug-in or tools for constructing the PLEs, the final structure constructed for a pilot group of students using the Elgg platform, , and their assessment of the process as a whole.

2 METHODOLOGY

2.1 Context and participants

The trial was conducted during the first term of the 2011-2012 academic year under the framework of the Postgraduate course in Education Psychology, which comprises the Interuniversity Master's in Education Psychology (MIPE), and the Interuniversity Doctorate in Education Psychology (DIPE). This postgraduate course is run jointly by four universities in Catalonia, the University of Barcelona, the Autonomous University of Barcelona, the University of Girona and Ramon Llull University. It is aimed at students and professionals interested in acquiring a solid theoretical and practical grounding in the contributions of psychology to educational theory and practice.

This Postgraduate programme currently has a Virtual Community comprising the students and faculty taking part in MIPE and DIPE. As well as offering all the standard resources, the MIPE-DIPE Virtual Community provides access to the virtual classrooms of the courses and to the complementary curricular activities of the two programmes. Both the virtual community and the virtual classrooms are built on the Moodle platform. Using this framework, we propose an innovative project which aims to replace this Moodle platform with one that incorporates the resources currently available and also allows users to (re) construct and (re) organise it as a personal work and learning environment.

The trial involved 15 students (12 women and three men) and three teachers (two male, one female) from the optional module on the MIPE *Environments, tools and practices of virtual learning* (bearing 10 ECTS credits). This module is organised in fortnightly work sessions, supplemented by online activities held during the two-week interval in between the classes.

2.2 Design of the PLEs

The trial began by adapting the Elgg platform in two ways. First, some of the plug-ins or tools provided by the platform were customised and adapted for use to construct PLEs; second, using the same plugins, a virtual environment was organised that would facilitate the construction of PLEs suited to the educational design of the module. The organisation of this environment includes two levels: the public webpage providing access to the module, and the spaces or sites for the construction and use of the PLEs by students.

Figure 1 shows the screen that is seen by participants and Internet users who access the environment's public website. The site is organised in two columns displaying different types of information and activities relating to the module. In the left-hand column, the first block, *Acerca del M9* (*About M9*), briefly introduces the module and its objectives and contains a link to the syllabus. The next block, *Documentos (Documents)*, provides links to some of the required reading for the module. Below is the syndicated content of the module, and further down the block *Foros (Forums)* shows the titles and presentations of the course's open forums (accessible after registration). The first block in the right-hand column is *Grupos activos (Active group)s*, which shows only the name of the group and number of participants and does not allow access to their names or profiles. Below are the block *Noticias (News)*, the module's public blog, and the block *Etiquetas (Tags)*, which aids the search for documents and information via keywords. The block *Foots (Photos)*, showing images of the sessions, closes the right-hand column.

Bescor Q	_Quiero Registrame_ Entra 🕤
Acerca de M9	Grupos Activos
En este espacio desarrollaremos el módulo Entornos, instrumentos y prácticas de aprendizaje virtual del Master Interuniversitario de	Entrada sesión 4 blog grupo abierto / 6 miembros M9 público
Psicologia de la Educación (MIPE) durante el primer semestre del curso 2011-12.	Entrada sesión 3 blog grupo abierto /7 miembros M9 público
Los objetivos principales de este módulo giran en torno a la revisión y profundización de algunos planteamientos teóricos actuales sobre la	tita sesión 2 blog grupo abierto / 8 miembros M9 público
ensenanza y el aprendizaje en entornos basados en TIC, y al analisis y valoración de algunas propuestas de diseño de contextos de enseñanza y aprendizaje basados total o parcialmente en el uso de estas	Entrada sesión 1 blog grupo abierto / 8 miembros M9 público
tecnologías.	Ver todos los grupos
(ver plan docente)	Noticias
Documentos Gros, et al. (2009) El desarrollo de herramientas de apoyo para el trabajo colaboratiro en entornos virtuales de aprendizaje Adminimrador hace 34º días	Newer: Bienerenidos al módulo 3. Entornos, intromentos y próticas de aprendizaje virtual del MIPE Arna Engel hace 307 días Más noticias
Coll, et al. (2006). Analisis y resolucion de casos- problema mediante el aprendizaje colaborativo. Administrador hace 147 días	Blog M9 Blog: Sesión 4. De los entornos de aprendizaje en línea a los entornos personales de aprendizaje, y los entornos de enseñanza y aprendizaje
	mediados por TIC. Administrador hace 102 días
_Feed de noticias de esta comunidad. _Cultura y Educación	Blog: Sesión 3. Los entornos de aprendizaje en línea: diseño tecnopedagógico y prácticas de uso, y usos educativos del wiki
_Educational Psychology Review	Ver más entradas
Ver más contenidos sindicados	Etiquetas
Foros	former ignarationsata ta.
Foro del NT4 En al transmisso de los dos o tres días siguiantes a la sesión de intito de un NT, el propo responsable de la presentación de las lecturas	alfabetización digital
revisadas y discutidas durante la sesión abrirá el foro con una breve	The second state of the se

Figure 1. Public view of the module M9 environment

From the plug-ins or tools offered by the platform Elgg we selected the ones that were likely to be most useful to students in their attempts to create three distinctive spaces for their PLEs: **desktop**, **profile**, and **groups**.

The **desktop** has two functions. First, it is an individual, private space where each user can activate plug-ins or tools (blogs, personal files, bookmarks, RSS, calendar and events, activity on the platform, etc..), depending on their interests and preferences. Second, we added a set of default plug-ins common to all members of the class group (files, links, photos, videos, news, active groups, labels...). Using this shared plug-ins, teachers incorporate materials for the module (compulsory and supplementary readings, links to web sites, video presentations, etc.), although students can also add resources they consider being of interest to all participants. Moreover, some plug-ins are set up in such a way that their contents are fully public and accessible to any Internet user.

Participants automatically access this desktop after registering on the M9 public website. The individual plug-ins are distinguished from the default plug-ins that are common to all members by the colour of their titles: black for individual plug-ins, and red for common ones. Figure 2 shows an example of a participant's desktop.



Figure 2. Partial view of a participant's desktop.

The **profile** (see Figure 3) is an individual space that allows participants to present information to others at different levels of privacy: to individual participants, to specific groups, to all registered participants or to all Internet users in general. As in the case of the individual space on the desktop, in the profile each user can activate the plug-ins or tools they choose (blog, personal files, bookmarks, RSS, calendar and events, activity in the platform, etc.). However, in contrast to the desktop, each participant can also decide who they will share their resources with – i.e., with individual participants, other small groups, all registered participants or the general public.

-	Anna Fi	head	Distances in the	Editor págitos		
5.5	Anna Li	igei	Record and a	Percenta a		
	II CALFT he herrardent	publicado la Unta de la as para el aprendizole l	6 200 majores 1915	Activated	101.01 +	
Editar icono de perfil	herp. (salpt	ra ak/tep-100 toda for	learning 3021	Amigos		
Anigos	thiracide	universidad de battele	na españa	Maria Rentraberta nigus levendo evto	No as et alguiten salbeis cuando	
Artigos de Tanal de		satarby stora entellight also		non-comunican lan modulu? Bette	run comunican las potas d rada modulo? Responden	
	T-DIS	and the state of t		faste fill liter - Com	funto St. Uni - Convention	
		Teaching Politica		D Plat Jalos	🗱 Pilar Balinas Guapa, in	
22000	Same weeks a	sea bijar sar scha		vedates i	tel, pero ha de	
Sobre mi Ductora en Psicología y profesora lectora en el departamento de Psicología Evalutira			tears % die			
y de la Educación de la Universidad de Barcelona. Mis interesses actuales se centran			freedow or commo	-		
en el impacto de las tecnologías de la información y de la comunicación en la aduración, concretamente en el estudio de la interacción y la construcción del				Commitar		
emoclationies en entremos	colaborativos de s	noedanza y aprendizaja	r mediados par			
entes tecnologias.				C Maria Fortroberta	(Tailout	
Mierv				help-52 tilei - Corr	hait-5) the Otherse	
and even		Teralda Imprimible del p	entil Mitathatia	20 Piler Saline	- Grantian Martial	
				hair 'ti dia		
Aún no se han regi	strado datos er	éste eCV		Distance in terms		
					Comentar	
					Comentar	
ficherus	attent a	Grapos	antar	T Hards for Here Here	Concetar	
Ticheron	umo a	Grapes	anta	Maria del Mar Mer robir un Schern B	Conventar anta scalas de cametro MAA	
Ticherus	unter a arre Chilli, de las THC	Grapos iii Estrata o pible o	senat rebite 43kg 309	 Maria dd Mar Mer robir ar Schen Di O, Africa Alwert pol et is jagno Thie 	Economication autra scalas de cumento MAR lici un conventacio to 1	
Aberos A biogracio a biograci	uttuar + arros (1811). 1 des Jan THC	Grapes Grapes Dirada u piblice	sense rokina i Salog 509	 Maria dal Mar Mar sobie so Echero Di Altia Alvaret pol Altia Alvaret pol Altia Alvaret hos Altia Alvaret hos Altia Alvaret hos 	Economication commentes MA3 loci que consentraciones es 7 servitos suba stueres a Econope 3	
Techerona Techerona	uttur a arra (2013). 1 de las THC	Grapos iii fairada o piblico iii fairada o piblico	settae rokion 4 Ming 309 rokion 3 Ming 309	 Blaris del Mur Mer nobre un Scherre Be en la pagna Ente Ablas Alvaret Ju-b en la pagna Ente Alacia Alvaret Ju-p pagna en el ente Versión poeten 	Connentar anta acaba de comento MAB Red um cohemitacio es 3 surdio ana nuevia a Zonago 3 nar de la signesi	
Riberon In Parlina y Apri In Inferración en la recenda. Non 179 dan Man Vertados sas fabrero	uttor a ave (2011). de las TPC	Grapes iii Datrada o piblico iii Datrada o piblico	arria rakie 4 king 509 rakie 3 king 509	 Intrin del Mar Mar oble un Schere Ib Altia Abaret pà della Abaret pà glas cos é cosà Vesto, possene dual 	Connector antia acobo de comentos MAB. Red un consentiacio es 3 servito una nuerra "Ensago 3 nar de la signessi	
Riberon Patiba y Apri Ta biegrache ta bie	uttor a lava (2013). 1 de las THC	Grapos i pibles pibles pibles i pibles i pibles	arria rakin 4 king 309 rakin 3 king 309 rakin 2 king 309	 Maria del Mar Mer sobie un Scheres (Alcia Alveret pub el alcia Alveret pub pignos times pignos con el cual Uresde, postere dual here Pit time - Cen 	Economication antia accelor de recomentos MAAS fed es committación es 3 sortin una muerte e Zonagro 3 nar de la identesia mettar	
Televis Patility y ages to be gravity to be gravity to be encode. Not 179 first Max Ver todes see Roberts Patility y ages to be add	unce a nere (1911). die ber 192	Grapos i pibles pibles pibles pibles i pibles	anna robh 4 Alleg 309 robh 3 Alleg 309 robh 2 Alleg 309	Maria ald Mar Mar solar an Editors Ib Aldra Abeer pain Aldra Abeer pain Aldra Abeer pain Aldra Abeer pain Aldra Abeer Pain Base Painter Con Aldra Abeer Painter Con Base Painter Con Aldra Abeer Pain	Connector entra scalar de entransito MAS Eci en consentacion e 3 surtir una morte surtir una morte surtir una morte surtir una morte surtir una morte surtir entransito entransito entransito	
Pickerses Pickerses	attan e nere (1913), de las THE Attan e	Grapes Estrada to piblico Estrada to Estrada to E	anna reide 4 Meg 505 reide 3 Meg 505 reide 2 Meg 505	 Maria del Mari Mari Maria del Maria Maria Maria aggina tina del aggina tina del aggina tina del adversa la - para ten accore addita Ataversa addita Ataversa additaddita Ataversa addita At	Connected anta socia de connectes 643 del de constitución e 3 sorta una merte casepo 3 mer de la sistema entrar entrar augun 3/min	
Tableron Padlike y Ages Cablegracies Cablegracies Labertown March	una + rec (2011). de las TEC subst + suurnal of	Grapes Dirada e Dirada e pibles Dirada e pibles Dirada e pibles Dirada e pibles	terica roline 3 Ming MH roline 3 Ming MH roline 3 Ming MH	 Maria del Mar Mar Maria del Mar Mar Años Averer hos Años Averer hos Años Averer hos Años Averer hos Barto del Averer hos Barto del mar Barto del ma	Commenters antia accuba die commento MA3 loci aut consentrative no serta una amerita serta una amerita metrate	
Packerss Packerss Packers to here provide to here pro	una + ere (MIL), de le TH de le TH una +	Grapos i Dirada s piblico Dirada s piblico Dirada s Dirada s piblico Dirada s piblico Dirada s piblico	terrise relation & Mirry 2019 relation 3 Mirry 2019 relation 3 Mirry 2019 relation 1 Mirry 2019	Interia del Mar Mar Maria del Mar Mar Maria de Marener può del Adata Antereta può indica Antereta può indica Antereta Na- dena Maria del Marca Maria Maria del Mari	Commentant anna accelus de commento MAS los es consentracion es 1 servico esta asserva esta de la alecena esta de la alecena esta de antas estas	
Paterns Paterns Paterns Tables Tab	unor a mercianti, de las yre unor a ported _earning coleci	Grapes Grapes Grapes Grapes Grapes Grapes	sense relation & Schoog Selfo relation & Schoog Selfo relation & Schoog Selfo relation & Schoog Selfo relation & Schoog Selfo schoos & Schoog Selfo	Interior del Amerikan Marcia del Amerikan Marcia an Edicerno Marcia Antonen han Adata Ahmeni han Handa poesina Terre 16 size - Cen Marcia Antonen han Terre 16 size - Cen Marcia Antonen han Marcia Antonenhan Mar	Connector antia scalas de commetto MAA Boi en cohemitacio a 3 serzia una suerta Estange 3 ner de la siecena estas	
Takerus Patiha y agu ber for the second ber of the second tas Ver take ses fabres ESS Freed International Jo Computer-Sup Collaborative I (Browse Res	ence + res (2011) de las Tre enter + nurnal of poorted carning ults)	Grapes Grapes	uma natio (Silog Silo natio	A Marke del Mer Men Marke in Biders Del Marke and Acheres può mi a signine Elses adde and acheres and adde and acheres Market Advances del Market Advances Market Advances	Connection antia acaba de commento MAC atta acaba de commento MAC atta atta acaba de commento de commento de presento pr	
Acterns A pathagangan California San 274 fair San 274	attes + second of ported _earning ults) ecleation	Grapes Dirada of pibles Dirada of Dirada	unio 4 Mag 20 nio 4 Mag 20 nio 1 Mag 20 nio 1 Mag 20 nio 1 Mag 20 norm	Andrea del Amerikan Marcia del Amerikan Marcia Adverse puè Adverse puè Adverse puè Adverse puè Adverse puè Adverse puè Marcia Adverse puè Adverse puè Marcia Adverse pu	Connections and a scalar dy comments MA3 Gold States (2maps 2 marks a scalar scalar (2maps 2 marks a scalar scalar (2maps 2 marks a scalar marks a (2maps 2 marks a (2maps 2 mar	
A sterns Patible y age or is exceeding the second the second	uno a mechanya ana ang ang ang ang ang ang ang ang ang ang	Grapes pibles pibles pibles pibles pibles pibles pibles pibles pibles pibles pibles pibles	arrat estin 4 Mag MH estin 1 Mag MH estin 1 Mag MH estin 1 Mag MH arrat	A Marcia del Aner Mar Marcia del Aneres può del Sal Alexees può del piòpica Estas del piòpica del piòpica del piòpica estas del piòpica estas del piòpic	Contential of antia acuba de- mentos MAS los en consente Para Ebarro I acua de la interna estas	
Acterns And the particular y age Control of the the segment of the Control of the second of the Computer Sup Collaborative I (Browse Res Barrandon of the second of the second of the second of the second of the second of the secon	were a ever CHELD, the last THE murrar l of examined units) existing- in-the hourseling- hourseling-	Cropes Printer Prin	unio Alber Mo este Alber Mo este Alber Mo este Alber Mo este Alber Mo este Alber Mo este Mo este Alber Mo este Alber Mo este Alb	Instring det Amerikan Maring det Anderer Spel Maring Anderer Spel Addres Anderer Spel Addres Anderer Spel Bert Statument Maring Spel Maring Spel Mar	Economican antia acabin de commendo MAG antia acabin de commendo MAG activitada activita	
And the second s	ann - are (2010 de les 192 estate - ported .carring ults) et kning- fanste fans	Crapes Control on Control on	unital A Ming MP esisien 3 Ming MP esisien 3 Ming MP esisien 1 Ming MP esisien 1 Ming MP marter Mart	Interior del Mare Mare Marcia del Mare Mare Marcia and Marenes puè Marcia del Marenes puè Marcia del Marenes Marcia del	Entreester remember and such für remember 1 marken 1 marken 1 marken 1 marken	
kterns Padiha y age Characterization Market and Annual Market and	una + rec (2011) ide les TPC attes + rurnal of egentad ults) subsidies ide of assisted for framed	Grapper Construction Constru	anta esta 1384 50 esta 1384 50	Instructed Market Market and Bolders and Annual Market and An	Extension Factors extension for the second to the concentration of the second to the concentration of the second extension of the second exte	

Figure 3. View of a participant's profile.

Groups, as the name implies, are spaces for group work. Group members can activate the plug-ins they consider necessary to carry out their work, and, as in the profile, they can set the level of privacy of each of these resources (allowing access to individual participants, other groups, all registered participants or to Internet users in general). Figure 4 shows the plug-ins available for groups, discussion (forum), bookmarks, files, blog, pages (collaborative editor), photo albums and the group calendar. The most interesting feature is the fact that all participants can create groups at any time, including as many other participants as they wish. So there may be predefined groups for the educational activity as a whole, or temporary groups that appear or disappear according to the interests and needs of the participants in a community.



.Figure 4. Plug-ins available for Groups

Furthermore, the environment also has forums, an internal message system and a microblogging tool which participants can access via a navigation bar located on the top of each page after registering and entering the module's virtual space.

As we noted above, the module (M9) is organised in work sessions which are held every fortnight and complement the online activities. Each of these face-to-face work sessions consists of two parts. The first comprises a set of activities that work on five main thematic clusters – i) the impact and uses of ICT in formal education, ii) learners in the twenty-first century: learning in the context of digital culture; iii) online learning environments: technological and educational design and use; iv) from online learning environments to personal learning environments, and v) ICT and education: towards a new ecology of learning. In the second part, which takes place in a computer room, a set of ICT tools and environments is explored (blogs, tools for visual representation of knowledge and wikis and collaborative editors, forums, etc.) along with studies and trials selected because of their relevance and interest to education in general and to formal and school education in particular. Each part lasts around 2 hours and 30 minutes.

To create and manage their PLEs, students were explicitly advised to use the features that Elgg provides for the following:

- seeking, organising, processing, sharing and disseminating information in groups of varying sizes;
- creating spaces for individual work and learning, both public and private;
- creating spaces for collective work and learning, both public and private;
- incorporating inputs from other virtual spaces;
- incorporating inputs from persons not connected to the module.

The second part of the first face-to-face session was devoted entirely for training participants to use Elgg's tools and resources in order to build personal spaces for working and learning. In the remaining

sessions, the problems raised by students in the use of various resources were resolved. Doubts or problems that arose during the course of the term were resolved online through the message platform.

3 **RESULTS**

To assess the results of this innovation study, we use three sources of information: the structure of the PLEs built by the pilot group of students, their responses to a questionnaire rating their overall impressions of the construction and use of PLEs which they completed at the end of the course, and the comments during a classroom session evaluating the experience, also at the end of the course.

Regarding the structure of the PLEs built by the students, we use activity logs to identify the number and type of plug-ins added by each participant in their desktops or profiles and to assess the extent to which participants customise their environment. Table I shows the total number of plug-ins activated by each of the participants from the 18 available. Importantly, some plug-ins (such as RSS feeds) can be activated more than once. As can be seen, more than half of respondents (10) activated between 10 and 20 plug-ins in their desktops or profiles, three activated between six and eight, and five participants activated only three or fewer. For example, student E1 shows a high degree of customisation, combining the following plug-ins: friends, favourites, files, RSS feed, blog, bulletin boards, groups, calendar and my location. In contrast, student E6 presents a low degree of customisation, with only friends, blogs, photo albums and pages.

Participant	Number of plug-ins activated
E1	20
E2	17
E3	1
E4	1
E5	8
E6	6
E7	8
E8	20
E9	18
E10	11
E11	13
E12	20
E13	3
E14	1
E15	1
P1	10
P2	17
P3	18
E = student P= teacher	

Table I. Number of plug-ins activated by participants

Table II shows that the plug-ins most frequently activated were friends, favourites, files, RSS feeds and activities, followed by microblogging, blog, bulletin boards, groups, photo albums, pages, and calendar. The least used were Twitter, video, my location and my last pictures. My latest videos and video feeds were not used at all.

Plug-in	Frequency
Friends	16
Favourites	11
Files	10
Activity	9
Rss feed	8
Microblogging	6
Blog	6
Bulletin boards	6
Groups	6
Photos	5
Pages	5
Calendar	4
Twitter	3
Video	3
My location	2
My latest photos	1
My videos	0
Last RSS video	0

Table II. Type and number of plug-ins activated by participants

The questionnaire was answered by 14 of the 15 students who participated. Their satisfaction and their global assessment of the PLEs were evaluated through four questions using a five-point Likert scale, with 1 corresponding to the minimum score and 5 the maximum. The first of these questions asked students to state the extent to which the PLEs helped them learn to learn. The responses were clearly positive, with a mean score of 3.07. The second question asked students whether the PLEs helped them improve their own learning processes and strategies. Again the answers were mostly positive, although slightly lower, with a mean score of 3. The third question asked students their opinion on the possible interest of building the MIPE-DIPE Community on the basis of PLEs. In this case the responses were largely positive with a mean score of 4.07. The fourth and last question asked students to rate their overall satisfaction with the technical performance of Elgg; 42% rated their overall satisfaction as low or very low, 35.7% as high, and none as very high. In this final question the mean score was 2.8.

During the assessment session after the end of the trial, students briefly presented their reflections on the experience in small groups. The analysis of the transcript of the session sheds further light on the responses to the last question in the survey. There was strong agreement that the technical performance of some of the Elgg plug-ins is very limited, particularly the forums plug-in, because discussions cannot be nested with the messages in response to the answers and because there is no text editor for the messages. The pages plug-in was criticised because it lacks a collaborative editor like wiki or GoogleDocs, and the files plug-in files because it does not offer the possibility of organising documents into folders. A final weakness mentioned by all the students is the lack of tools to customise the environment (e.g., different themes, colours, fonts, etc.).

4 CONCLUSIONS

This study has enabled us to reach a series of conclusions regarding the possibilities and limitations that Elgg offers for the design of virtual teaching and learning at university level, and its ability to combine an institutional context with a space, or set of spaces, that students can customise according

to their interests. Via Elgg, students create their individual learning ecologies and establish synergies between different educational and professional contexts, and develop their ability to learn to learn throughout their professional careers in the information society.

From this perspective, Elgg has two main strengths. First, it allows users to create spaces for individual learning and for learning in small and large groups, and in each of these spaces allows them to establish interactions at different levels of privacy. It creates an environment that combines individual and collective spaces that may be accessible only to colleagues, to the general public, or to particular people. Moreover, Elgg offers easy access to a large range of tools that each user can activate and configure according to their preferences and needs.

However, compared to other tools of the same type in regular use, the analysis of these tools shows that the benefits offered are quite limited. For example, Moodle forums offer many more features in terms of viewing and editing the contributions than Elgg, and editors like Google Docs allow much more sophisticated tasks than the corresponding tools in Elgg. However, the major limitation of Elgg (in our particular design) is, in our opinion, its inability to organise files in folders or some other form of ordering. This deficiency means that browsing the activities and files in Elgg is difficult and inefficient.

After mentioning these strong points and weak points, we should now look at the uses that students made of the tools available. Most students configured the tools to work in small groups and occasionally provided information of interest to the whole class group. However, we found no activities or tools specifically configured to pass on to the class the learning that students acquire in different non-formal educational and professional contexts, or the voices that are significant to them in these contexts.

We believe that through close collaboration with the developers of the technology, it will be possible to optimise the different tools in Elgg to promote the type of teaching and learning processes that we propose. We are more doubtful about the possibility of changing the organisational culture that pervades our universities: a culture which makes a clear distinction between knowledge and voices from "inside" and knowledge and voices from "outside".

REFERENCES

- [1] Coll, C., & Monereo, M. (2008). Educación y aprendizaje en el siglo XXI: nuevas herramientas, nuevos escenarios, nuevas finalidades. En C. Coll y C. Monereo (Eds.), *Psicología de la educación virtual. Enseñar y aprender con las tecnologías de la información y la comunicación* (pp. 19- 3). Madrid: Morata.
- [2] Adell, J., & Castañeda, L. (2010). Los Entornos Personales de Aprendizaje (PLEs): una nueva manera de entender el aprendizaje. En Roig Vila, R. y Fiorucci, M. (Eds.) Claves para la investigación en innovación y calidad educativas. Alcoy: Marfil Roma TRE Universita degli studi. http://cent.uji.es/pub/files/Adell_Castaneda_2010.pdf
- [3] Anderson, T. (2006) PLE's versus LMS: Are PLEs ready for Prime time? http://www.elearningeuropa.info/files/media/media11561.pdf
- [4] Attwell, G. (2007). Personal Learning Environments. The future of e-learning? eLearning Papers, 2(1) http://www.elearningeuropa.info/files/media/media11561.pdf
- [5] Coll, C., Bustos, A., & Engel, A. (2008). Las comunidades virtuales de aprendizaje. En C. Coll y C. Monereo (Eds.), *Psicología de la educación virtual. Enseñar y aprender con las tecnologías de la información y la comunicación* (pp. 299-320). Madrid: Morata.
- [6] Downes, S. (2007). Learning networks in practice. *Emerging Technologies for Learning, 2*, 19-27.
- [7] van Harmelen, M. (2008). Design trajectories: four experiments in PLE implementation. *Interactive Learning Environments, 16*(1), 35-46.
- [8] Asensio-Pérez, J.I., Bote-Lorenzo, M.L., Vega-Gorgojo, G., Dimitriadis, Y., Gómez-Sánchez, E., & Villasclaras-Fernández, E.D. (2008). Adding mash-up based tailorability to VLEs for scripted Collaborative Learning. In First International Workshop on Mashup Personal Learning Environments (pp. 14–17). Maastricht, The Netherlands, September 2008.
- [9] Casquero, O., Portillo, J., Ovelar, R., Romo, J., & Benito, M.(2008). iGoogle and gadgets as a platform for integrating institutional and external services. In First International Workshop on

Mashup Personal Learning Environments (pp. 37-42). Maastricht, The Netherlands, September 2008.

- [10] Milligan, C., Johnson, M., Sharples, P., Wilson, S., & Liber, O. (2006). Developing a reference model to describe the personal learning environment. In W. Nejdl & K. Tochtermann (Eds.), *Innovative Approaches for Learning and Knowledge Sharing* (pp. 506-511). Berlin/Heidelberg: Springer.
- [11] Wild, F., Mödritscher, F., & Sigurdarson, S. (2008) Designing for Change: Mash-Up Personal Learning Environments. *eLearning Papers*, 9 http://www.elearningpapers.eu/en/elearning_papers
- [12] Brown, J.S. (2000) Growing up digital: How the web changes work, education, and the ways people learn. *Change*, *32*(2) 10-11.
- [13] Barron, B. (2006). Interest and Self-Sustained Learning as Catalysts of Development: A Learning Ecology Perspective. *Human Development, 49*, 193-224.