



Strategy approach for eLearning 2.0 deployment in Universities

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Summary

The institutionally powered Personal Learning Environment (iPLE) constitutes our vision of how Web 2.0 technologies, people arrangement and data sharing could be applied for delivering open, flexible, distributed and learner-centred learning environments to university members. Based on the iPLE, this paper explores a strategy approach that universities could follow in order to deploy eLearning 2.0 tools and services. With that aim in mind, we review the patterns that Web 2.0 has successfully applied, and have been proved to encourage people to interact and to share information. Then, we present an eLearning 2.0 provisioning strategy based on iPLEs. Finally, we explain how this strategy can help translating Web 2.0 patterns to learning, and positioning universities as eLearning 2.0 providers.

Keywords

eLearning 2.0, institutionally powered Personal Learning Environment (iPLE), Personal Learning Networks (PLN), institutional Widgets (iWidgets), institutional Repositories (iRepositories), learn-streaming, Social Network Analysis (SNA), distributed model, community-centred model, learner-centred model.

I. Introduction

At present, most Higher Education Institutions have deployed Virtual Learning Environments (VLE) in order to manage eLearning as well as blended learning (Garrett & Jokivirta, 2004). In evolutionary terms, VLEs were designed and have been used in a logical way as a virtual extension for physical classes (Weller, 2009). Although nowadays VLEs play an important role, we suggest that there should be a progression towards other type of systems that will help dealing with the many issues that current education must address for both individuals and institutions.

In recent years we have seen how Web 2.0 technologies (social software, cloud-computing, web mashups, ubiquitous computing, etc) have changed the way we develop and use applications, create and consume information, and feel the ownership of technology. Many researchers (Ajjan & Hartshorne, 2008; Bart, 2008) think these new tools, services and paradigms could play an important role in the so-called eLearning 2.0 (Web 2.0 services adapted to learning needs). Nevertheless, the impact of these technologies on education has been less dramatic than its impact on other spheres of society (Conole, 2008). eLearning should adopt and adapt some of the patterns learnt from Web 2.0 in order to fit the participatory and learner-centred model of eLearning described by Downes (2005). We argue that for this model to succeed, eLearning 2.0 should be learner-centred regarding proactive actions, while maintaining a community awareness for social data management, and it should give a distributed access to services and data inside as well as outside the institution. This means a shift from the institution-centred and monolithic model of VLEs to a more heterogeneous and open model. A Personal Learning Environment (PLE) is an attempt to build a suitable learner-centred environment that embeds every tool, service, object, content, evidence and person involved in the digital part of the learning process. However, educational institutions still play a main role and that is the point to propose an institutionally powered Personal Learning Environment (iPLE) (Casquero et al., 2010).

Based on the iPLE, this paper explores a strategy approach that universities could follow in order to take advantage of the benefits and opportunities that offering eLearning 2.0 tools and services to learners could bring. To that end, we review the patterns that Web 2.0 has successfully applied, and have been proved to encourage people to interact and to share information. Then, we present an eLearning 2.0 provisioning strategy based on iPLEs. Finally, we explain how this strategy can help translating Web 2.0 patterns to learning, and positioning universities as eLearning 2.0 providers.

II. Successful patterns from Web 2.0

The patterns that successful Web 2.0 services have in common are: distributed model regarding both software and data allocation and use; community-centred model for social data management; and user-centred model for proactive actions.

There are many software and data models to be put in practice for eLearning 2.0: Cloud Computing and the exploitation of software (SaaS), platforms (PaaS) and infrastructure (IaaS) as a Service; storage of personal data in the cloud; use of distributed web applications, etc. This pattern offers some advantages like continuous improvements of web applications which users can experience straightaway, public APIs that allow developers to employ services in new ways ("mashups") that original creators did not even imagine, and constant and automatic synchronization with all our data and applications because they are not linked to a single computer.

This distributed model for software and data allocation leads to the existence of specialized and dedicated servers that attend thousands of users related to a specific service. This takes us to the next pattern: community-centred model for social data management. Software developers have taken advantage of having so many people interacting with their software and they have used all the user-generated information in order to improve the functionalities. As a result, most of the services generate a sense of community awareness, and information is human-filtered through folksonomies, rankings and schemas of reputation. New communities formed by people with the same interests spring around these services.

Finally, end-users are less likely to have one huge and monolithic Internet application to solve all their needs, but rather to have a collection of distributed applications with simple interfaces for each particular need. User-centred model for proactive actions represents the way in which users can read and write the Web their own way, effortlessly and using those tools that best suit their needs.

III. iPLE-based strategy to embrace eLearning 2.0

This section plots a theoretical strategy that universities could follow in order to deploy eLearning 2.0 tools and services. This strategy is centred in the provisioning of iPLEs for learners.

3.1 Strategy Step 1: merging both personal and institutional spheres by providing iPLEs

Many students do not read their institutional email inbox, neither do they access to VLE platforms on a regular basis (Frankola, 2001). However, they opt for external web services that they use everyday and for long periods of time to communicate with peers, and to manage their e-mails, their bookmarks, their feeds, etc. Even if institutions could provide these tools, many users could be reluctant to abandon the external services they are already using because they see them as more innovative or because they get connected to their own communities and personal networks through them. In this situation, there is a risk of building two separate and sparsely connected spheres: the institutional and the personal one.

We suggest that educational institutions could provide learners and teachers with pre-configured PLEs that offer a minimum base which learners can start working with, and from which they can build and customize their own learning environment. The iPLE is an attempt to build a PLE from the point of view of the university, so every institutional service can be integrated, but flexible enough to interact with the wide range of external services learners could consider important during their life-long learning (Casquero et al., 2010)

Nevertheless, if students tend to choose external web services that they use everyday and for long periods of time to communicate with people they want instead of using services provided through VLEs, then why it would be different in the case of an iPLE? The answer to this question is twofold. First, the iPLE is a single environment where institutional tools and services are integrated with personal tools and services used by the student in his daily routine. As institutional sphere shares the same environment with personal sphere, we suppose that there will be a greater interaction in learning activities. Second, the iPLE promotes using tools and services that belong to the personal sphere for supporting the learning process of the student. Students know and access services like YouTube and Twitter everyday, but generally they do not use them for learning. Our aim is to foster the use of personal tools and services as an integral part of the learning process, for instance: using YouTube for delivering works, or Twitter for building a Personal Learning Network (PLN) that Siemens (2003) describes as the set of learning communities where the learner organizes his learning process.

3.2 Strategy Step 2: exposing institutional services with iWidgets

The rapid growth of information technologies inside and outside higher education institutions to support learning, research, library and management services, has led to the appearance of software islands which are very difficult to deliver outside the institution. Institutional Widgets (iWidgets) are small hooks created by the institution and learners will make use of them from iPLEs in order to pull live content or functionality that university hosts. Therefore, iPLE can be understood as a preconfigured PLE for a specific learner, incorporating the iWidgets the university considers

that learner needs. iPLE is loosely coupled with the institutional software services, but highly customizable by adding user-defined Widgets (uWidgets), which are external widgets created by third parties and selected by the user. Of course, power users may prefer using iWidgets or uWidgets from their own-configured PLE, e.g.: a web site, a starting page, a widget-enabled email account -like Gmail-, etc.

Competition for recruiting good students and teacher is becoming harder and more global. This leads universities to get concerned about gaining visibility regarding society for the results they obtain in terms of research and education, as well as trying to extend the relation with graduates during their professional careers. Strategy Steps 3 and 4 address these issues.

3.3 Strategy Step 3: gaining wider social visibility through iRepositories

When building learning content, the use and proper combination of resources like video, images or documents for generating more complex information units like learning activities, wiki pages and blog posts that are to be published and distributed in content management systems is very common. The present approach tries to manage these kinds of resources with institutional Repositories (iRepositories), which are institutional accounts in the most suitable repository services, e.g.: YouTube for videos, Flickr for images, del.icio.us for bookmarks, SlideShare for presentations and Scribd for documents. This approach takes advantage of the added value these repositories give us for our resources: easy embedding in other sites, search, ranking, and community creation. Moreover, this means there would be an increasing number of learning resources 'living' in popular repositories, allowing the institution to gain wider visibility regarding society.

3.4 Strategy Step 4: retaining learning resources and evidences within the Learn-Stream

The permanent link with former students can be obtained if iPLEs prove to be useful and flexible enough in order to manage life-long learning. Learners should be able to retain their contents (evidences of acquired competences) out of virtual classrooms. We understand life-long learning process as closely related to the concept of *Learn-Stream*. The ensemble of the distributed conversations in which one user participate, the person's "life-stream", can be managed and gathered by social aggregator tools such as Frieenfeed. From the learning perspective, we define "learn-streaming" as the activity of publishing and sharing within one user's PLN. It allows students to keep track of what they have done on-line. The aggregation of the learn-stream for every student allows teachers to get a detailed picture of their progress in a particular course or subject. Institutions can benefit from it as learn-stream allows to look up the individual activity of students for curriculum purposes. As learn-streaming implies a data flow between different endpoints (from universities to different external organizations), the present architecture encourages universities to adopt open and distributed federation infrastructures to support it.

3.5 Strategy Step 5: creating a collective intelligence

Human-Computer Interaction (HCI) has become socialized, that is, HCI is about how people use computers to communicate and collaborate with each other. This transformation is also affecting the way we learn. Indeed, the term PLN appears to be associated with the development of information and communication technologies. If we assume that learning is socially mediated it is evident that, from the perspective of Technology-enhanced Learning (TEL), social networks are a key element to understand how we can improve the design of learning environments.

The theory of connectivism (Siemens, 2006) provides a new perspective for learning in a networked environment. In opposition to previous learning theories, such as behaviorism, cognitivism and constructivism, which focus primarily on the process of knowledge acquisition inside the person albeit they stress the importance of social mediation, connectivism claims that knowledge rest in social networks. The intrinsic relation of learning networks and connective knowledge in the context of social media is also stressed by Downes (2010), who sees learning networks as the fundamental architecture of eLearning 2.0 and stresses the importance of aspects such as diversity, autonomy, connectedness and openness.

If an iPLE is given to each institution member, the resulting iPLE Network will permit learners to form social networks that will lead to successfully deploy PLNs where they can perform learning experiences for many educational purposes. But the iPLE Network is also an opportunity to easily

and automatically collect and digitalize social data because it is already available as side effect of university members using iPLEs. At the same time, the iPLE Network is a valuable one for delivering the results of Social Network Analysis (SNA), and giving feedback and recommendations to learners and teachers.

IV. Positioning universities as eLearning 2.0 providers

After identifying in section 2 the patterns that Web 2.0 has successfully applied, this section will try to explain how the concepts introduced in section 3 can help us in translating those patterns to learning.

4.1 Distributed model for learning software and contents

Universities have started to build virtual libraries within VLE platforms that usually allow only university members to access those digital resources created by the institution. While removing the need of a physical place, institutions still put high virtual walls around the content they generate. But it is not just the content nature what it has changed, the channels used for content distribution and the tools related to that content are also being transformed. VLE platforms are an attempt to fulfill the whole cycle that has proved to make a limited use of the real power of the Internet.

In addition, the arguments for developing, hosting and maintaining certain institutional services are becoming increasingly weak when it can be done externally for free, or at least much more cheaply. Institutions can benefit of Cloud Computing technologies and use as commodities many of the software services that today are still developed, self-hosted and maintained inside the institution. But not only are institutional data and software moving to the cloud, also personal desktop or workspace is gradually being unlinked from a single computer and flowing among servers and several devices we use (desktop, laptop, cell phone, etc). In this context, it is increasingly easy to manage from the same environment personal and institutional spheres, formal and informal learning, classmates and friends, etc.

The iPLE is an answer for the needs a distributed model for learning software and learning contents introduce. It is based on a hybrid solution that promotes, when it is necessary and convenient, the decentralization of learning systems and the integration of external web services that provide an added value that cannot be easily replicated within the institution.

4.2 Community awareness

Universities generate a huge potential regarding social relations between university members (teachers, researchers, students) from the same institution, between people from different institutions, and even relations between people from university and people from outside. However, current VLEs do not hold all those relationships of their members.

How could PLNs be organized in the university? The answer is given by the enhancement of the services that are commonly used by members of the university so that these services provide a sufficient flow of information and social interactivity to any tool used by university members. In this way, instead of trying to force university members using a social networking site to manage their PLNs, we propose that institutional services should offer a social networking service inherently. That is, the institutional tools and services must provide themselves the added value of managing not only learning resources, but also the synergies between users using those resources. This is an essential step, not trivial, is a radically different view of what is usual in social network design. How is that step taken? With an iPLE.

An iPLE is a personalized environment with tools, services and learning resources suited to learning, so that when adjusted to the needs and tastes of the user, it ends up becoming an indispensable element in their daily work. This is precisely one of the reasons that lead us to consider the iPLEs as an excellent entry point for the development of PLNs. The widespread adoption and customization of an iPLE by each university member, would allow managing and growing PLNs easily. An iPLE will become, not only the easiest way to contact with my PLN, but also a source where I can discover new learning peers, communities, services and data because the iPLE can recommend what my PLN is consuming. Besides, SNA, when applied to all the

information a network of iPLEs generates, can play an important role in discovering underlying connections and making explicit relations between people with similar interests.

Lastly, the importance of some kind of community awareness exceeds the temporal bounces of studying in the institution. Learners can benefit of it before entering the university and after finishing their degree. Moreover, university should have greater visibility for the general public and iRepositories try to share with the society part of the generated knowledge. Every node of the iPLE network serves to create, filter, publish and consume digital resources that iRepositories store.

4.3 Learner centred approach

Learners cannot expect universities to provide them with all the digital resources they need in their learning process. Moreover, it is important that students learn how to find what they need outside of the institution. This is part of the learning process and the do-it-yourself ability applied to digital issues will be essential in their careers. Nevertheless, learners cannot live absolutely unlinked from some of the online resources universities offers and that is why iPLE maintains the 'i' for 'institutionally' powered.

Previous VLE platforms have tried to create a comfortable place for teachers where they could display every digital resource they thought their students would need for learning a subject. From the beginning it is conceived as a limited space for a limited kind of resources during a limited time. VLE platform could be described as teacher-centred (teachers design the virtual classroom), subject-centred or institution-centred (institution hosts and give access), but it can be hardly described as a learner-centred approach.

iPLE tries to give an answer from the learner point of view. Learners can be comfortable with something they feel of their own and it can be morphed and adapted to their needs: it is not limited by the kind of resources; it is valuable for the whole life-long learning; it connects the learner with a wide range of users and services offered by external institutions. Unlike VLE platforms, iPLE is not the answer given by the teacher to a specific learning need during a course, but the answer people build around their lifelong learning process.

V. Conclusions

The proposed strategy focuses on the following aspects: exposing institutional services through iWidgets (institutional Widgets), small hooks created by the institution and used by learners from their (i)PLEs in order to pull relevant information or services that the university hosts; gaining wider visibility regarding society using iRepositories (institutional Repositories), learning resources managed by the institution but hosted in external services and available in public channels; strengthening life-long learning thanks to Learn-Streaming, contents coming from different distributed services, linked into one single stream that plots the learning process over time; finally, extending the strategy to integrate aspects of SNA, a way to discover interesting social findings (e.g. relations, positions, temporal patterns) that students and teachers could use to create opportunities (social capital discovery, information disclosure) to improve their awareness of learning context structure and Personal Learning Networks (PLN).

In order to size the benefits of using iPLEs, we are conducting an exploratory empirical study for a distance learning undergraduate course in which more than 130 students from 9 different universities work on collaborative problem-solving activities over a period of 15 weeks. We have split students into a *control* group (Moodle as learning environment) and an *experimental* group (iPLE as learning environment). The prototype of iPLE comprises Friendfeed as container for learn-stream and iGoogle as starting page and widget engine. The same schedule and materials are being provided for both groups so we can see if a different learning environment makes any change. We hope the improvement iPLE can offer in personalization, ownership, communication and awareness will produce better results in terms of student satisfaction, participation and collaboration.

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