BUILDING WEB 2.0-BASED PERSONAL LEARNING ENVIRONMENTS – A CONCEPTUAL FRAMEWORK

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Abstract

The purpose of this paper is to suggest approaches and guidelines for using Web 2.0 tools and services for developing personal learning environments (PLEs) to manage formal and informal learning leading towards a lifelong learning path. This paper considers a PLE not as a particular site or tool that contains all the applications and provides access to users, but rather a framework for incorporating Web 2.0 tools and services chosen by the learner for collecting and processing information, connecting people and creating knowledge.

The concept of PLEs and their advantages for learning are based on the often unquestioned belief that NetGen learners are familiar with Web 2.0 tools and they know how to use them for learning. Recent studies however question this popular wisdom. These technologies have been developed outside education, and are mainly being used for informal networking, and creating and sharing media files for entertainment and recreation. This paper proposes that systematically developed frameworks and guidelines can help NetGen learners to use Web 2.0 tools for formal learning and presents four different approaches to integrate Web 2.0 tools for learning.

This paper is part of on-going research investigating personal learning environments, entitled PELICANS (Personal E-Learning in Community And Networking Spaces) project based at the University of Leicester, UK and at the Universitat Politècnica de Catalunya, Barcelona, Spain.

Rationale

The concept of PLE is rather a new one; according to the UK’s Joint Information Systems Committee affiliated Centre for Educational Technology and Interoperability Standards (JISC CETIS), the PLE concept originated from a paper by Olivier and Liber (2001) entitled ‘Lifelong learning: the need for portable personal learning environments and supporting interoperability standards’. The concept of PLE has since evolved into many different trends.

There is a shift in the education landscape towards developing e-learning environments based on PLEs. The majority of e-learning approaches in education are so far based on Virtual Learning Environments (VLEs), such as Blackboard, WebCT, Moodle, Sakai, amongst others. This shift towards PLEs has a number of possible drivers. One is the policy and academic discourse on ‘personalisation’ of learning, and learning environments (DFES, 2005). Personalisation of learning is the idea that learning technologies should enable the various aspects of learning – the content, the mode of delivery and access – to be offered according to the personal circumstances of the learner, and that the learner should have greater flexibility and choice of options for learning.

A second driving factor for increased attention towards PLEs is the emergence of and widespread access to a new generation of internet-based tools and technologies, popularly known as Web 2.0 tools with greater potential to play a central role in personalising learning, offering the learner to take an active role in managing technology. The term Web 2.0, coined by Tim O’Reilly captures a ‘trend towards greater creativity, information sharing and collaboration amongst internet users’ (The Economist, 2008, p. 98). Web 2.0 tools and services such as podcasts, wikis, blogs, social networking sites, social book marking tools, and many other tools enable greater participation by users with limited technical know-how to create and share content and to communicate with others (Mason and Rennie, 2008).
A related factor for greater enthusiasm for PLEs is a critique of VLEs as institutionally-owned and driven, and as serving the needs of the institution rather than the learner (EDUCAUSE, 2006). Learners have limited control over the extent to which the tools of a VLE can be customised. Developments in Web 2.0 technologies offer opportunities to make use of tools and services that are free and available in the public domain, with potential for integrating formal and informal learning (McFedries, 2007).

Linked to the above is the idea that the majority of current generation of learners – often referred to as Net Gen learners or Milennials (a term coined by Oblinger and Oblinger (2005) to refer to those born after 1982) - are familiar with computers and internet-based technologies and are capable of using Web 2.0 technologies for learning. This notion however is questionable, as highlighted in some recent studies on information literacy skills of NetGen learners (Lorenzo and Dziuban, 2008; Katz and Macklin, 2007). While it is possible that a majority of current learners are familiar with technology tools, it is not clear whether they are familiar with using Web 2.0 tools for formal learning.

The Digital Natives, as Prensky (2001) calls them, have a way of learning that is markedly different from the previous generations (the digital immigrants). Some authors argue that this is not an “age” issue, but in any case it seems to be obvious that the approach to processing, acquiring and managing information (whether it be for entertainment or for learning purposes) is changing. As noted by Karl Kapp1:

[these] kids are already using Web 2.0 technologies comfortably and effectively. If we old folks (over 30) don’t figure out how to effectively use these tools to help the younger generation learn what they need to be successful in our baby boomer-run companies, government agencies and other large organizations then we learning and development folks will be irrelevant.

Kapp stresses educators need to be innovative in their e-learning provision: electronic pages of text followed by multiple-choice questions will not motivate these learners:

We better stop bad-mouthing Web 2.0 or eLearning 2.0 and start using these technologies or be passed up by the “digital natives” as Prensky calls them.

This does not mean that VLEs will disappear, but rather that they will continue to evolve. Some authors propose that the VLE will shrink and become a container into which a variety of plugs and extensions can be connected (Booth, 2007, as quoted by Severance et al, 2008). This is very close to the image of PLEs as a hub/extension combination and there is already research being carried out in this area; for example, the SOCKET and WAFFLE projects (Clark, B.; Booth A., 2006)², which point towards a flexible VLE system design, that can naturally evolve into PLE systems.

The development of Web 2.0 and the transition of users from consumers to “prosumers” also points to a personalisation of the users’ space; futurist Paul Saffo (2006)³ sees Web 2.0 as the age of personal media. As pointed out by Thompson (2007):

[…] students will soon arrive at college expecting a transformative form of education. […] Changing to accommodate Web 2.0 students probably will happen in fits and starts, just as the integration of technology has occurred in the business world. No one knows yet what this new model will look like, but the variety of strategies examined above [wikis, blogs, podcasts, social networking tools] provides partial glimpses.

1 http://karlkapp.blogspot.com/2006/12/gadgets-games-and-gizmos-informal.html
2 http://www.elearning.ac.uk/features/socket
PLE - Relevance to Higher Education

The main goals of establishing a framework for building a PLE using Web 2.0 tools are:

1. Helping students embrace Web 2.0 for formal studies. Although a large majority of students enter university with prior Web 2.0 experience, their use of such tools and services is usually confined to creativity and entertainment. Students need help to extend their knowledge of the Web 2.0 for learning.

2. Learning how to use Web 2.0 for lifelong learning. By helping students to develop a personal learning, research and networking space, they will be able to access and up-date their learning material regardless of their geographical location, and stage in their life and career.

3. Preparing HE students for future employment. The role of learning and development is becoming more important in corporate and professional life (Universities UK, 2008; ECAR, 2007; Theil, 2008). Students familiar with Web 2.0 tools and services hosting formal and informal content that is portable across the education/employment frontier will be well placed for future employment.

What is a PLE – views and definitions

A PLE has the potential to not only support lifelong learning, but to bring together all forms of learning, including both formal and informal, occurring at a particular time. Learning takes place in different contexts and situations, and a PLE can enable the learner to organise his or her own learning.

Terry Anderson⁴ defines a PLE as ‘[…] a unique interface into the owners digital environment. It integrates their personal and professional interests (including their formal and informal learning), connecting these via a series of syndicated and distributed feeds. The PLE is also a portfolio system allowing the user to maintain their repository of content and selectively share that content as needed. It is also a profile system, exposing the user’s interests in a variety of ways allowing automated, but selective search of the individual and their digital contributions. Of course, the PLE is a social as well as an information environment, connecting the user to individuals and cooperative events and activities throughout the Net.’

It has also been proposed to use the term Personal Work and Learning Environments (P-WLE) instead of PLE, to show that learning and work are not separate areas, and that in fact learning goes on through life. It has also been suggested that PLEs should be called Personal Knowledge Environments (PKE). As pointed out by Lubenski⁵, a PLE spans through all the different learning and working experiences of an individual, who would connect their PLE to the appropriate learning or working environment (high school’s or university’s VLE, workplace learning and professional development facilities). A new concept, Open Learning Networks (OLN) has been suggested⁶ to describe the connection between VLEs and PLEs: ‘The choice appears to be a centralized, enterprise “networked learning environment” on one hand and open, customizable “personal learning environments” on the other. As we look to the future, it is worth considering the possibility of bringing these two worlds together in what we might call “open learning networks” (OLNs). In an OLN, faculty, students and support staff would reap the benefits of enterprise, networked software for authentication, identity management, integration with SISs, etc. Additionally, they would be able to use a vast range of Web 2.0 applications, integrated into the OLN via web services and other sorts of integrations.’

The connection between VLE and PLE is also considered in current research on developing skills required to use Web 2.0 technologies for lifelong learning (Personal Knowledge Management (PKM) skills). Cigognini et al’s (2008) learning design model as part of a circular process that represents the individual's learning experience: it starts in a closed and structured environment (VLE), and progresses gradually, incorporating Web 2.0 tools and e-portfolios, towards personal learning environments and social networks as learners develop their experience.

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⁴ http://terrya.edublogs.org/2006/01/09/ples-versus-lms-are-ples-ready-for-prime-time/
⁶ http://www.jonmott.com/blog/?tag=ple
and understanding of Web 2.0 tools. In this approach, the PLE is the set of tools that learners use to perform self-guided, informal learning, using higher order Personal Knowledge Management (PKM) skills.

Advantages of PLEs

- **PLEs integrate formal study with life outside the educational institution**
- **It serves as a digital record of the learning process, since PLEs do not disappear at the end of the formal learning cycle, as opposed to VLE-based content.**
- **PLE environments can be customised and connected with other applications, according to the needs of the learner.**
- **The learning curve associated with a VLE is eliminated, although it is replaced with the need of learning how to use a variety of We 2.0 tools.**
- **The PLE is owned and managed by the individual, which leads to sense of and practical application of educational self direction. The contributions to the PLE may be re-used by the owner as many times as needed.**
- **The PLE provides the user with social presence from within the user’s own system.**
- **PLE components are constantly being updated.**
- **PLEs are designed primarily as lifelong learning environments, as opposed to VLE, which are designed to enact the classroom online.**

Obstacles and issues surrounding the development of PLEs:

- **Support.** It becomes unmanageably complex if every user has different applications. Nevertheless, it is true that digital natives are more familiar with the use of technology tool, and they tend to have a hands-on approach to learning how to use them. Tools and applications are also more intuitive and have built-in support. ‘People don’t take courses in how to use Facebook, after all’.
- **Suitability and technological complexity.** Users could adopt the wrong technology for a given task, although the use of applications and widgets makes it easier to try different approaches and choose the one they feel more comfortable with, or the one that is more appropriate in each case.
- **Interconnectivity.** Tools and applications are not designed to share data, although widgets and applications help users establish connections amongst the different tools that compose their PLEs.
- **Privacy and the “creepy-treehouse” effect.** Students might be reluctant to share spaces that they consider as their own with instructors or parents (McLoughlin and Lee, 2008). Nevertheless, the use of these tools may also be seen as an opportunity for students to share and communicate with ‘peers, experts and a wider community in ways that enable reflective, self-directed learning.

Limitations of current guidance on developing PLE

Although there is advice on how to develop a PLE, much of that information is available in blogs and the learner needs to look for information in blogs and trying to synthesise guidelines, much of which is based on personal

References:

7 http://terrya.edublogs.org/2006/01/09/ples-versus-lms-are-ples-ready-for-prime-time/
8 http://nogoodreason.typepad.co.uk/no_good_reason/2008/03/an-audit-on-whe.html
9 http://www.chrlott.org/2008/01/18/social-networks-vs-tools/
preferences and experiences of the blog-authors and commentators. Following is an example: an interesting description of how a PLE is gradually built based on the user’s needs (blogged by Tony O’Driscoll\textsuperscript{10}, in reference to his participation in a panel, together with Steve Downes, Brent Schelenker and Tony Karrer):

‘[…] once you start with a blog, (Hello WordPress/Blogger) your learning starts to take off. You start to get motivated to want to find a tool that helps make your space more conversational and co-creative/crow sourced in terms of production/interpretation of content/ideas (Hello Wiki). You then want to throw in some pictures (Hello Flickr/Ofoto) and inevitably want to find (or create) audio (Hello Odeo) and video (Hello Jumpcut, Eyespot and YouTube/Google Video) that further emphasize your point. You then want to take all these different piece parts together into a single place that is just for you (Hello MySpace….oh that is so yesterday why not build it out in 3D in Secondlife)…and suddenly you start to understand that we have finally tipped on a number of fronts[…].’

Another set of guidelines appears as follows, as written by Tom Haskins\textsuperscript{11}:

- Start with your vague and scattered interests
- Check in with your feelings
- Search for RSS feeds to subscribe to
- Interact with your best finds

In “7 Easy, Powerful Steps to Create a Personal Learning Environment”, Ahmad\textsuperscript{12} suggests a 7-step approach to using a blog-based PLE to support informal learning:  

- Base Your Effort on Passion: choose something you are passionate about, or relate the topic you need to learn to something you are passionate about
- Pick Your Topic: research online resources and narrow down the choice of a topic
- Find a Blog-Community: find people that are more knowledgeable than you in that topic, and socialise with them.
- Launch Your Own Blog: create a blog, so you can keep a record of your thoughts and keep track on how your perspectives evolve.
- Socialize Within a Blog-Community: follow RSS feeds and mingle with other bloggers, by posting your opinion and comments, and linking to other bloggers’ posts.
- Leverage the Power of Social-Bookmarking: use social-bookmarking tools to find better resources
- Leverage the Power of Social-Networking: bring your online contacts into your everyday network. Face-to-face contact is richer than just online socialising.

These guidelines show that developing a PLE is guided by personal perspectives and motivation. Individuals are advised to search for the appropriate tools and applications suitable for personal taste. We propose that a systematic approach is needed to provide guidelines for developing PLEs using a wide range of Web 2.0 tools available.

**Approaches to developing PLEs**

Our analysis of literature and current approaches to developing PLEs identify two primary approaches to conceptualising and developing PLEs:

1. a PLE as an object (environment or hub that contains all the applications and tools)
2. a PLE as a framework for integrating a variety of Web 2.0 tools of learner choice, to support learning.

\textsuperscript{10} http://wadatripp.wordpress.com/2007/04/13/web-20-and-personal-learning-environments-ples/
\textsuperscript{11} http://growchangelearn.blogspot.com/2007/09/if-this-is-your-first-ple.html
\textsuperscript{12} http://passionbasedlearning.com/2008/02/create-a-personal-learning-environment/
Both approaches have proponents voicing their opinions through blogs and Internet presence

**PLE as an object**

A PLE could be seen as an actual object, an environment, common to all users (although customisable to certain extent), that allows them to organize, collect, process and share information and knowledge. This is a more structured visualisation of a PLE, but one that raises many problems (mostly technical ones). Which platform to use? Will it be available in the long term or could it disappear in time? How many application programme interfaces (API) will be required to connect all these tools and applications? What if the applications and tools change somehow and that requires an update of the links between them and the PLE? Could users easily customise or change the PLE structure? Some examples of PLEs based on this approach are the PLEW (server) and PLEX (desktop) applications (CETIS, 2007) and Stringle.

**PLE as a framework**

In this case, the PLE is not a tool as such, but rather an approach to learning, based on Web 2.0 technologies; the “E” in PLE refers to the Internet itself and Web 2.0 technologies but not to a particular application. The PLE is unique for each user, and changes according to the user’s needs and experiences. As Atwell says, ‘Clearly any PLE application will be a perpetual beta.’

Students do use a variety of web 2.0 tools and applications (ECAR, 2007; Trinder et al., 2008). However, there is little evidence that students use these tools in an integrated manner suited for academic learning (McLoughlin and Lee, 2008). Such integration would follow a constructivist approach, with students constructing their own personal learning environment and thus their knowledge. In this sense, the PLE will be the result of using and connecting all these tools and applications.

This is the definition chosen for a PLE for the PELICANS (Personal E-Learning in Community And Networking Spaces) project based at the University of Leicester, UK and at the Universitat Politècnica de Catalunya, Barcelona, Spain. In this conceptualisation of PLE, each learner chooses their own Web 2.0 tools and connects them to collect, organise, process and share information, and manage their knowledge. Thus the sum effect of the tools, information, connections, storage and resultant knowledge actually create the PLE.

**PLE frameworks – our proposals**

Although this paper focuses on the PLE as a framework rather than as a particular tool or application, when building a PLE a learner needs to choose an application as a “hub”, or the central component for the PLE. This approach has many advantages: it makes it easier for users to access their collection of Web 2.0 tools; it facilitates the management of different logins and passwords; in certain cases, it allows the sharing of data between some of the applications that compose the PLE.

It has already been suggested that a social networking tool, such as Facebook could eventually be used as a “hub” to which a number of applications are connected via APIs, and replace somehow VLEs (Severance et al., 2008).

We identified four different approaches to building a PLE with Web 2.0 tools according to the choice of hub and the structural complexity of each one:

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13 http://ouseful.open.ac.uk/blogarchive
14 http://www.edtechpost.ca/wordpress/index.php
15 http://elearningtech.blogspot.com/
16 http://elearndev.blogspot.com/
17 http://nogoodreason.typepad.co.uk/no_good_reason/
18 http://zope.cetis.ac.uk/members/ple
19 http://ouseful.open.ac.uk/stringle/
20 http://www.knownet.com/writing/weblogs/Graham_Attwell/entries/6521819364

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1. Wiki-based PLE (Google sites)
2. Social network-based PLE (Facebook)
3. Social aggregator-based PLE (Netvibes)
4. Browser-based PLE (Flock)

Table 1 shows the four approaches and the Web 2.0 components of each one. Examples are given where available.

<table>
<thead>
<tr>
<th>Components / functionalities</th>
<th>Central hub</th>
<th>Wiki (Google sites)</th>
<th>Social networking (Facebook)</th>
<th>Aggregator / Start page (Netvibes)</th>
<th>Browser (Flock)</th>
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</thead>
<tbody>
<tr>
<td>Authentication</td>
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<td>Own, one-time sign-up</td>
<td>Own, one-time sign-up</td>
<td>One time sign-up</td>
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<tr>
<td>Blogs</td>
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<td>Through RSS</td>
<td>Through RSS</td>
<td>Blog editor</td>
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<tr>
<td>Email</td>
<td>No</td>
<td>Facebook messages, doesn't replace webmail</td>
<td>Gmail</td>
<td>Webmail access: Gmail, Yahoo mail</td>
<td></td>
</tr>
<tr>
<td>Online office suites</td>
<td>NumSum, DocStoc</td>
<td>Zoho Google Docs</td>
<td>All my Google services</td>
<td>*</td>
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<tr>
<td>Online storage</td>
<td>Box.net</td>
<td>Files app (box.net)</td>
<td>Box.net</td>
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<tr>
<td>Presence – microblogging</td>
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<td>Twitter</td>
<td>Twitter widget</td>
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<td>RSS</td>
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<td>RSS apps</td>
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<td>Social aggregation</td>
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<td>FriendFeed</td>
<td>Friendfeed</td>
<td>“Social web browser”</td>
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<td>Social networks</td>
<td>*</td>
<td>Hub is a Social Networking tool</td>
<td>Facebook</td>
<td>Facebook, Pownce</td>
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<td>Social bookmarking</td>
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<td>Del.icio.us</td>
<td>Del.icio.us</td>
<td>del.icio.us, Digg</td>
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<tr>
<td>Video</td>
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<td>Web albums</td>
<td>*</td>
<td>Flickr, Picasa</td>
<td>Flickr, Picasa</td>
<td>Flickr</td>
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<tr>
<td>Wikis</td>
<td>Hub is a Wiki</td>
<td>Google sites, TheWikiProject</td>
<td>Wikispaces</td>
<td>*</td>
<td></td>
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<tr>
<td>Comments</td>
<td>*</td>
<td>Provides a starting point for linking other resources. Supports widgets</td>
<td></td>
<td>It is a browser, so it is possible to access Google Apps, online storage, file conversion, Wikis, Blogs</td>
<td></td>
</tr>
</tbody>
</table>
Figure 1 shows the four approaches in a Complexity vs Connectivity/Versatility diagram.

Each approach is gradually more complex than the previous one; with Google sites, the user may access Google services through a central page or one by one, as needed. Creating the central page is as easy as setting an account. In the case of Facebook, the application itself provides the connections, as applications that are added by the user. When using Netvibes, the user not only has to create an account and a Netvibes page, but also has to decide how to connect the different tools using Widgets. Finally, Flock is a browser-based approach, and thus requires the users to install the Flock browser and then customise it. It also means that the users need the Flock-browser to be installed in whatever computers they might use.

Some implications of these approaches:

- Users do not need to buy a license to use a PLE, since it is built with tools and applications that are available for free on the Internet
- Support might vary between the different applications
- The learning curve for the applications will be different (some applications will take more time for the users to master them than others)
- There is a need for users to constantly update their knowledge of the tools, as the tools themselves are being improved and upgraded. [...] this “learning how to use the tools” precedes any learning that might be done with the tools.” (JISC, 2007)
- The choice of a Web 2.0 application as the starting hub of the PLE means that the PLE depends on the availability and stability of this tool. Alternative paths should be provided in case this tool is not available at any given time. The “hub” should only be used for convenience of access and login to various applications, but NOT as the central repository of files.
Wiki-based PLE: Google sites

Helen Barrett\(^{21}\) shows how some of Google tools may be connected using a network diagram:

![Figure 2. Connectivity of Google tools](image)

She also explains how to add and connect these tools to create e-Portfolios; the arrows in the diagram indicate the flow of information between applications. This arrangement could be easily expanded to create a PLE, due to the intrinsic connectivity of the various Google services, using Google sites as a start page.

![Figure 3. A start page created using Google sites](image)

Figure 3 shows an example of a start page created using Google sites. The page provides access to an online office suite (Google Documents), an RSS reader, web search, blog creation and publishing (Blogger), pictures and more.

\(^{21}\) http://electronicportfolios.org/google/index.html

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Advantages:
- Anyone that has a Gmail account has access to Google sites and its related applications
- Setting up the start page is a matter of minutes
- Files are easily shared; it allows users to collaborate online.

Disadvantages:
- Connectivity is limited to Google applications (although links to external applications may be easily added to the start page)
- Apart from online collaboration there are no other social tools available

Social-network based PLE: Facebook

A Social Networking application (e.g., Facebook) could also be used as a hub for a PLE. One advantage of this approach is that the users - digital natives - are already a captive audience, who have been using Facebook for quite a while. In fact, Facebook was developed with college students as main target.

As Ian Mcleod observes22, ‘Facebook is well on its way to becoming the ideal tool for the creation of Personal Learning Environments or PLEs.’ According to the latest ECAR study (2007), more than 80% of the students that answered the survey use Facebook or some other social networking tool. As Tracy Mitrano (2008) notes:

‘Let’s “face” it: Facebook has built the site, and students use it; we in higher education should come to recognize that this universal commercial site is here to stay. We should use it for advertising and for communications—and certainly for emergency messaging. The race is on: may the first institution to forge this adventurous type of innovative collaboration win.’

Figure 4 shows how Facebook could be connected to other Web 2.0 tools using APIs (“Applications”). Blogs can be accessed through RSS feeds, and some commercial VLEs are developing extensions for Facebook (Blackboard, for example, allows users to access it from Facebook, using the Blackboard Sync application, or through an intermediate application such as CourseFeed). There are also Applications to access Google Docs, Twitter, del.icio.us, Flickr, Picasa, wikis, SlideShare, Gmail and others.

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22 [http://machianations.blogspot.com/2007/05/facebook-as-ple-i-have-seen-future.html](http://machianations.blogspot.com/2007/05/facebook-as-ple-i-have-seen-future.html)
Figure 5. A Facebook page showing Applications to access Twitter, RSS feeds, Google Docs and Zoho.

- Advantages:
  - The target audience is composed mostly by Net Gens who already use the tool. They only need to be shown how to take advantage of it and transform it into an environment for collaboration and work.
  - Connections established by students could be carried on after they graduate, and be transformed into colleagues' networks (Linked-in like)

- Disadvantages:
  - Users may dislike using a tool that they perceive as related to their personal life for academic matters.

Social aggregator-based PLE: Netvibes

Figure 6. Netvibes connectivity with other Web 2.0 tools
Netvibes is an aggregator that allows users to connect a variety of Web 2.0 tools and access them from one site. It has a wider range of tools compared to Google sites, and it adds the social element by providing connections (“Widgets”) to Facebook, del.icio.us, Flickr and other applications.

- **Advantages:**
  - one-stop access to a wide range of Web 2.0 tools
  - one-time login for supported tools and applications

- **Disadvantages:**
  - Users are required to create an account and set-up a start page, adding the necessary “Widgets” to establish connectivity with their selected Web 2.0 tools.
  - When a Widget is not available for a certain tool, links must be added to the Netvibes start page instead.

![Netvibes Interface](image)

Figure 7. An example of a PLE based on Netvibes

*Browser-based PLE: Flock*

Flock is a Firefox-based browser that offers full integration with a number of social-networking sites, as well as with blogging tools. It also collects information from feeds, allows users to share text, pictures and videos, has integration with bookmark and photo storage services.

- **Advantages:**
  - one-stop access to a wide range of Web 2.0 tools
  - one-time login for supported tools and applications

- **Disadvantages:**
  - Requires user to install the programme (administrator privileges are required)

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23 [http://webometrics.fi/blog/blog/2008/02/page/2/](http://webometrics.fi/blog/blog/2008/02/page/2/)
Building a PLE with Web 2.0 tools – some guidelines

Users have different experiences and unique approaches to learning and using new technologies and applications. Flexibility should be provided, and users should be encouraged to try different strategies to building their PLEs. Table 1 shows some starting hubs around which PLEs may be built. The choice of hub will be done by the user, and guidelines will be provided.

Prior to building the PLE, students will be gradually introduced to a variety of Web 2.0 tools, through both class work and activities. Once they have become familiar with the tools, they will be able to connect them and create their PLEs. Some users will probably figure out they can do this before it is actually suggested by the tutor.

- Step 1. START. Choose a hub
- Step 2. CONNECT. Draw a diagram that shows how tools and applications connect with your hub; use Table 1 for guidance, but do not restrict your choices only to tools shown on the table. When alternatives exist, use the tool or application you feel more comfortable with, or the one you have more experience as a user.

Figure 8. A Flock start page
• **Step 3. VLE.** Find out whether your VLE has an interface to any of the tools in your PLE, and decide whether you will establish a permanent connection between your VLE and your PLE, or rather will use your PLE as a repository for materials and contents downloaded from the VLE.

• **Step 4. PRIVACY.** Make sure you understand how does your hub control access to your PLE (passwords, internal connections) and choose privacy settings if available. Some tools may be accessed from within other applications. It will be up to you how to do this, and whether to choose a unique password for all applications or not.
Concluding remarks and further work

This paper proposed a framework to develop a PLE and outlines four different approaches. To put the conceptual framework into practice, we have planned a pilot study to be carried out on a Facebook based approach to developing PLEs. In the first stage, the study will focus on two groups of students, enrolled in 1st and 2nd year of a Business Management programme, at college level at the Universitat Politècnica de Catalunya, Spain. The study will be carried out during both semesters of the 2008 – 2009 academic year.

We are currently in the process of designing e-tivities (Salmon, 2002) for the chosen subjects (Introduction to Information Systems and Business Information Systems). This will follow the proposed approach, introducing first the Web 2.0 tools and then proposing the creation of a PLE. The suggested hub will be Facebook, since informal surveys in the target population show that a high percentage of the students use this tool as a start page for communication, and would be willing to explore potential applications for educational purposes. We also perceive that Facebook shows the best connectivity of the four approaches considered, and provides so-called Applications for most of the basic components of a PLE:

- **RSS feed:**
  - Use Mini-feed Import option (includes Google Reader, blogs, Last FM, del.icio.us and more)
  - Add an application (Simply RSS, Blog RSS Feed Reader)

- **E-Mail:** Facebook has a message system and contacts may be imported from most popular webmail services (Yahoo, Gmail, and Hotmail). It can also display the user’s email address under Contact information. Message system does not replace webmail, and has limited functionalities.

- **Online Office suites:**
  - Zoho
  - Google Docs
  - In both cases, login details are required only once. Both applications allow online collaboration between user and contacts.

- **File storage:**
  - Users can store pictures directly on Facebook. The Online Office suites allow users to store files online (200 Mb with Zoho, 1 Gb with Google Docs).
  - The Files app connects to the user’s Box.net account (1 Gb)
  - Mediafire app (no storage limit)

- **Presence & microblogging:** Twitter application in Facebook allows user to update their twitter status, and also have Twitter update Facebook status automatically.

- **Social aggregation:** Facebook provides apps for
  - Pownce
  - Ping.fm
  - FriendFeed

- **Social Bookmarking:** Del.icio.us

- **Wiki:**
  - Google sites
  - Wetpaint announced a Facebook app, but it seems it has been discontinued
  - There are apps for creating Wikis inside Facebook (The Wiki Project, for example)

- **Video:** Youtube videos may be added using the FunWall app

- **Web Albums:**
  - Picasa app
- Flickr app
- VLE integration: Blackboard Sync (Blackboard is the VLE currently used at the University of Leicester)

- Other applications with potential uses for education and learning:
  - ScanR / Notecentric Courses and Notes (take and share notes)
  - MyOffice (online collaboration groups)
  - ScrapBlog (multimedia presentations)
  - SlideShare (share presentations)
  - User-created Mash-ups
  - Calendars, time/task management applications

It is important to emphasize that the use of Facebook as the PLE’s hub will be only a suggestion, and users will be encouraged to try other alternatives, based on their interests and experiences. We expect this will constitute the second stage in our study.

A survey, based on the 2007 ECAR study survey (ECAR, 2007), will be used to measure the outcomes of the study. The survey will explore students’ technology skills both before and after taking these subjects, and the impact of using a PLE in their learning.

We expect that this study will provide evidence for the potential of Web 2.0-based Personal Learning Environments as educational tools, the ease of adoption by students and, in the long term, their importance in supporting lifelong learning.

References


ECAR (2007). The ECAR study of undergraduate students and information technology.


