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Web 2.0 and New Learning Paradigms

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Summary

Since 2004 the term "Web 2.0" has generated a revolution on the Internet and it has developed some new ideas for Education identified as "eLearning 2.0". The ambiguity of both terms does not allow the affirmation of a new paradigm for technology-enhanced distance education, but it seems that some ideas do change key aspects in the old curricula:

- the Net as the platform, or the multi-device oriented system, changes the concept of studying at any place, any time;
- collective intelligence and rich user experiences affects the concept of authority in educational systems;
- tags and RSS readers allow us to revisit traditional taxonomy, knowledge organization and information retrieval;
- the option to choose between several devices to work on learning tasks (PDA, iPod, computer…) seems to be a technical and not relevant question, but that implies the option to learn at every time: while travelling, walking, etc. In Web 2.0, the difference between study times and other times seems to disappear.

This article is sceptic about the current changes at eLearning institutions and businesses, but points out some of the changes that will take place outside their courses and programmes. During the coming years, eLearning 2.0 will be used as a commercial promotion concept, with courses including Web 2.0 resources without touching the knowledge authority and the business control access. However, at the same time, a distance-learning attitude will be developing, mainly in non-formal education, which will end the separation between learning and living.

Keywords: eLearning, Web 2.0, innovation, learning, paradigm, courses, distance, non-formal

1 Web 2.0

The term "Web 2.0" appears for the first time during a brainstorming organized by Tim O'Reilly and MediaLive International in 2004 (O'Reilly, 2005). The first Web 2.0 Conference takes place a few months later [http://www.web2con.com/]. During these four years the term has been widely used to refer to new exciting applications and sites. This is really a successful term. And a relevant number of these citations relate Web 2.0 to eLearning, even generating a new term: "eLearning 2.0" (Downes, 2005). So, what is Web 2.0? Or, what is it not?

1.1 What it is not

Web 2.0 is not a clearly defined set of sites or tools, nor a specific website or recourses centre on the Internet. You cannot 'go to' Web 2.0, nor subscribe to it, register or log into it. It is a concept used to refer to sites and resources or developments that have some common characteristics. But, at least until today, there is no registered tag that certifies what is or is not Web 2.0.

Web 2.0 is not a new web, with new languages or technology, new sites, new pages, etc. Some of the most remarkable resources of Web 2.0, like blogs or wikis, come from the nineties. But some technologies are key for the development of Web 2.0 sites, as Ajax or mash-ups. And every day hundreds of new sites appear built under the specific ideas that define the Web 2.0. Web 2.0 is not a new business question, even if it suggests new opportunities for a commercial development.

1.2 What it is

When the people at the brainstorming thought about how the World Wide Web was changing, they found some key differences between the new sites and the older ones: a new way of designing participation, hosting services, and web-based communities, promoting creativity and information sharing. They found specific technologies like wikis and blogs, a new way of creating web pages like mash-ups, and a massive use of descriptors or *tags* in what has been defined as a *folksonomies*.

So, Web 2.0 is a trend in the World Wide Web. And there is not a unique understanding of what is or is not. Some people include "Second life" as a Web 2.0 site and technology despite the fact that it is not a web application - the same goes for Napster or BitTorrent.

The initial description of Web 2.0 was based on the following list (O'Reilly, 2005):

Web 1.0	Web 2.0
DoubleClick	Google AdSense
Ofoto	Flickr
Akamai	BitTorrent
mp3.com	Napster
Britannica Online	Wikipedia
personal websites	blogging
evite	upcoming.org and EVDB
domain name speculation	search engine optimization
page views	cost per click
screen scraping	web services
publishing	participation
content management systems	wikis
directories (taxonomy)	tagging ("folksonomy")
stickiness	syndication

And for O'Reilly, the key to decide if a site either is or is not Web 2.0 is this sentence: *The Web is the platform*. When revisiting the concept later on, O'Reilly pointed out to other elements like the relevance of the business dimension of this revolution and the collective intelligence (O'Reilly, 2006).

Other ways to approach Web 2.0 is through images. I personally consider that the visual and audiovisual dimensions are features of Web 2.0, even if they are not at the core of it. Between the countless maps 'representing' Web 2.0, I have chosen these two:

http://kosmar.de/wp-content/web20map.png	A tag cloud that uses colour and size to better describe the weight of ideas and technologies on Web 2.0. To make your own tag cloud definition you can use: http://tagcrowd.com/
http://www.internality.com/web20/	This map in Spanish collects a wider description of sites and resources. Its interactive versions allow for quick navigation and help to understand the common core of the sites. It is part of a book by Fumero & Roca (2007) published by the Orange foundation.

In fact, as Anderson (2007) argues, the best way to define Web 2.0 is "*to make a reference to a group of technologies which have become deeply associated with the term: blogs, wikis, podcasts, RSS feeds etc., which facilitate a more socially connected Web where everyone is able to add to and edit the information space*".

1.3 Web 2.0 characteristics

Cobo and Pardo (2007) offer seven principles of Web 2.0:

- The Web as the platform
- Harnessing the collective intelligence
- Managing databases relevance
- Not more software versions
- Lighter programming
- Multi-devices orientation
- A semantic Moore's Law.

Anderson (2007) describes six big ideas behind Web 2.0:

- Individual production and User Generated Content
- Harness the power of the crowd
- Data on an epic scale
- Architecture of Participation
- Network Effects
- Openness

Despite the fact that this is not generally recognised, I consider the audiovisual dimension as characteristic of Web 2.0 as well. Of course, the audiovisual explosion on the Web is a consequence of the increasing bandwidth. But distributing audiovisual materials are also conditioned by other factors:

- Production costs, not only economic but also the human effort involved in personal products.
- Distribution costs and limits, in terms of server capacity, service availability, commercial restrictions, etc.
- Technical costs, or the equivalent technical knowledge and resources availability by users.

As a consequence, video distribution on the Web has been limited to institutions or medium to high-tech individuals until recently. Several Web 2.0 web sites, notably YouTube, have let users overcome these limits.

After this brief overview of key ideas that define Web 2.0, we could analyze how they change eLearning.

1.4 Critical visions

Not everyone agrees about the real importance of Web 2.0.

Tim Berners-Lee considered the Web (1.0) more as a collaborative workspace than an information repository (Berners-Lee, 1999). He argues that Web 2.0 is just an extension of the original ideals of the Web. Perhaps it is only a new opportunity to empower these ideas.

Web 2.0 has generated the "2.0 lexicology" - including eLearning 2.0. One of these new terms is "Bubble 2.0" that describes Web 2.0 as a new and big bubble similar to 2006 effect on "dot-com" companies. An interesting discussion about this objection can be found in The Wall Street Journal (2006).

A post from Rob Millard (2007) on his blog states that around 50% of senior managers do not understand benefits of promoting Web 2.0 in the workplace, and a third do not understand it at

all. Other sources confirm the scepticism among companies about the actual potential of Web 2.0.

2 What kind of Web 2.0 resources do you find at eLearning courses?

With the initial definition of Web 2.0, or better said its *lack* of definition, it is not easy to recognize if a distance technology-enhanced course is using Web 2.0 elements.

Sometimes the eLearning sites use technologies associated with Web 2.0, mainly Ajax, micro-formats or open APIs. These sites choose a lightweight or simplified programming model as opposed to websites where the whole software development is produced from scratch.

But frequently users recognize specific Web 2.0 products or ideas as described below.

2.1 Wikis

"*A wiki is essentially a website constructed in such a way as to allow users to change content on the site*" (Graeme, 2006). A wiki is used to refer to the created document, the site where it is located and the software to produce it. The key elements of a wiki are:

- Hypertextual structure
- Social authoring - collaborative production
- Process log in "history"
- Limited use of html - lack of layers, cascade styles, JavaScript…
- Dynamic document - always under construction

Wikis are used in Education in several ways:

- To support collaborative work, substituting old .doc or .pdf documents.
- To produce a course or study corpus in cooperation with all academic stakeholders: lecturers, students, …
- To distribute information to students, in order to facilitate the updating of materials by the professor.

An old but well-informed report on wikis in education by Graeme at:
http://m.fasfind.com/wwwtools/magazines.cfm?rid=26594

2.2 Blogs

Whereas the wiki is a way of constructing knowledge, a blog is a way of distributing news. Some key elements:

- There are one or several authors that produce entries
- Visitors can add comments
- New entries and comments do not substitute older ones
- It is possible to subscribe in order to receive news via email or through RSS readers.
- Entries usually include the source of information, thus validating it.

Specifically for Education:

- Teachers have used blogs as an easy way to produce dynamic learning environments without previous knowledge of html.
- Students have used blogs as an alternative digital portfolio or as a learning log.
- Ultimately, blogs have been used as support for collaborative work.

Williams and Jacobs (2004) have proposed a classical description of educational blog applications.

2.3 RSS reader pages

While most professors introduce blogs in traditional curricula, making the most of their potentialities, students are in general not acquainted very extensively with these new resources. RSS reader pages with their shared entries page, also under RSS syndication rules, have not been introduced as a new way to access information which is based on collective intelligence and collaborative work.

2.4 Online office

Online office applications have also been called "Web office". It is also common to refer to these applications as "Web desktop" or "WebTop" as opposed to "Desktop" because it is an environment where the applications run at the browser. Online Office refers to a packet similar to Microsoft Office or Open Office that includes word processor, data sheet, multimedia presentations, etc.

Online office facilitate the collaborative production of documents online, with some history, discussion and annotation resources, as well as a controlled publication and production management system.

While wikis have been widely used, similar word processors at online office sites are not usual. It should be noted that there is a clear difference between the two environments: while wikis have a hypertexts-based conception, word processors at Office are linear documents with links. At present – March 2008 - the Web exhibits only a few references to educational use of this tool: Vicki A. Davis, for example, relates a multimedia presentation joint development at:
http://coolcatteacher.blogspot.com/2007/09/and-walls-came-down.html

Mark Wagner (2007) reflects on the educational possibilities of Google docs (also Google Apps) but with few or no reference to actual uses (see also "Create a permeable Classroom" 12/10/2007).

2.5 Social bookmarking

While most students and professors make use of the potential of Google when searching for information, they hardly make the most of shared bookmarks as a new information access method based on collaborative selective searching. As early as 2005, Buley library suggested the use of social bookmarking in education (see *Frequently answered questions* by "the Distance Education librarian"):
http://frequanq.blogspot.com/2005/02/social-bookmarking-in-education.html

2.6 Video repositories

To share video clips at YouTube or some of the several sites that offer this service has become a welcome way to introduce audiovisual material in eLearning courses. Some specific web sites focus on instructional or educational videos, such as Teachertube, Our media, Sclipo, Expert village, Ubu films and EngageMedia. This has helped to solve technical or size-related problems in the distribution of audiovisual products for eLearning courses.

2.7 Shared documents and podcast

Video clips are not the only kind of documents to share. Professors and students are used to accessing multimedia presentation, written documents and images, for example. As for the audiovisual perspective, podcasting is a different way of sharing audiovisual material. As opposed to Youtube or similar sites, in podcasting documents are downloaded on the client computer for a free use. There are also quality differences.

For educational purposes, digital reusable learning objects repositories as well as the OpenCourseWare consortium or the Open Educational Resources initiative have become available.

David Porter provided a now classical report on learning objects (Porter et al., 2002) which may be supplemented with the text by Stephen Downs (2004).

2.8 Video on-line

While some eLearning institutions have included online video as a resource on their websites, some professors prefer to access public open resources via Stickam or UStream to distribute videos to their students in their distance lectures or coaching sessions.

2.9 Social networks

Social networking has worried educators from the beginning; as a youth phenomenon, it has also been widely studied. Elgg is social networking software developed specifically for education, although it seems that the biggest difference in comparison to traditional software is the control of access to materials.

Social networks are at the basis of Web 2.0 understanding, but the concept does not fit easily in traditional curricula. The closest one can come to a social network in eLearning is in a community of practice (Downes, 2005).

2.10 Group work spaces

Of course eLearning courses have used group workspaces and virtual campuses. But the latest development in this field of the Web 2.0 is the Personal Learning Environment (PLE). Elgg is a PLE software. Other experiences about PLE at education can be found at:
http://www.cetis.ac.uk/members/ple/resources/ple_summary
http://www.niimle.ac.uk/home.htm

3 But, where are the new paradigms?

While the short description of Web 2.0 resources shows that they have started to be used, they seem to have little or no impact on the structure and conception of the old learning paradigms on which today's curricula are built. The most accepted resources are the ones oriented towards document production and distribution such as wikis, blogs and video sharing.

But eLearning courses have not yet adopted aspects related to collective intelligence, horizontal relations, dynamic knowledge conceptions and to new information management tools such as tags and social bookmarking. It is too early to speak of a new paradigm, but there are some elements that do not fit easily in the old eLearning paradigms. A listing of these would include the following points:

3.1 The network is the platform. Learning at any place

Yes, of course, eLearning implies that learning can take place at any place, referring to the physical location of students. But in the web, eLearning assumes that the student has to work in specific places, mainly the campus sites or the libraries or resources that the system considers of "educational value".

In Web 2.0, the network is the platform, and "any place" means any place in the network. The student decides where to work -in the web. In this context, the PLE is a personal space organized by the student where he/she organizes his/her own resources, and these resources are located at any place in the web.

Therefore, in this "new paradigm", the eLearning course does not offer so much a "virtual space" (virtual campus, virtual classroom), but a space for communication between students,

peers and tutors. And also, it offers students and professors resources to help them to improve their own PLEs.

3.2 The collective intelligence: social construction of knowledge

The old educational paradigms are mainly based on the concept of an author, but this is a concept related to the age of literacy, which was not even valid in the age of only spoken communication. This concept of a specific author of knowledge is under discussion in the cyber age.

On university campuses, wikis have come to be accepted as long as authors are clearly identified. Web information without author is still considered unreliable and not to be trusted.

While at traditional course control on documents are based on authority, at Web 2.0 the high number of contributions that compensate individual errors provides the control.

3.3 Data base: tags vs. descriptors

At eLearning courses tags are seen as some kind of low-level descriptors. They do not distinguish between folksonomy and taxonomy. The importance of informal tag production way is not sufficiently appreciated. Collaborative tagging, social classification, social indexing and social tagging are similar concepts. There is, however, a need to clearly differentiate between these terms.

3.4 Beyond the level of a single device: PDA, iPod, computer… any place, any time

The option to choose between several devices to work on learning tasks seems to be a technical and not relevant question. But that implies the option to learn at every time: while travelling, walking, …

eLearning courses seem to be based on the concept of studying “any place, any time”. But in reality, this is not the case. Traditional distance courses do consider studying at any time, but these moments are considered to be “study moments”. That is, there is a time to study and a time for other activities. In Web 2.0, the difference between study times and other times seems to disappear. Perhaps this is a question of formal vs. non-formal education. In any case, in the next years we will hear more about this idea.

If the difference between study time and other time disappears, it could mean that we learn as we are active doing other things, just as children do.

3.5 User experience richness: learn from peers

A key aspect in eLearning is p2p learning, learning from peers. Of course concepts as “peer review”, “peer tutoring”, etc. are not new. But in the traditional paradigm there is a clear difference between professor and students, as in Web 1.0 there is a difference between the expert and the novice.

In Web 2.0 this difference is more subtle. And of course it is not compatible with those eLearning courses that offer pages and pages of pdf documents. In eLearning 2.0 “*Rather than being composed, organized and packaged, eLearning content is syndicated, much like a blog post or podcast*.” (Downes, 2005).

Other aspects to analyse are related to a semantic Moore’s law or with a new business model.

3.6 Some key ideas for eLearning 2.0

Downes (2005) suggests some ways in which eLearning 2.0 could be organized:

- Organizing communities of practice as basis for eLearning programmes
- New tools such as blogs or podcasting to be used in new ways.
- Digital portfolios based on PLE or blogs systems
- Syndicated content
- Learning as a creative activity. And a platform rather than an application
- Accent on the use more than on the design
- Increasing use of mobile learning and games.

3.7 Future scenarios

In eLearning initiatives two strong forces converge: the traditional Higher Education institutions and the business world. There will probably be no radical change. And some anthropological ideas concerning orality, literacy and cibercy related to a change in information management shall take a long time to be implemented in educational systems.

During the coming years, eLearning 2.0 will be used as commercial promotion concept while courses will include Web 2.0 resources without touching the knowledge authority and the business control access.

However, at the same time a distance-learning attitude will be developing, mainly in non-formal education, which will end the separation between learning and living (Daniel, 2006b).
But for now, we have only some few ideas that suggest more a future than a current new paradigm for eLearning.

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