

Sharing innovative teaching experience in higher education on the Web.

An interdisciplinary study on a contextualized Web 2.0 application for community building and teacher training

Stéphane B. Bazan
UIR Web Science @ CEMAM
Saint-Joseph University of Beirut
Beirut - Lebanon
+9611421000

stefan.bazan@usj.edu.lb

Christophe Varin
UIR Web Science @ CEMAM
Saint-Joseph University of Beirut
Beirut - Lebanon
+9611421000

christophe.varin@usj.edu.lb

Sabrina Saad
UIR Web Science @ CEMAM
Saint-Joseph University of Beirut
Beirut - Lebanon
+9611421000

sabrina.saad@usj.edu.lb

ABSTRACT

This paper presents a case study on a particular higher education environment project (INNOV), where teachers use Web 2.0 applications to create online professional communities through an empowering learning strategy. The study focuses on how teachers, with basic knowledge of Web 2.0 tools will experience community building processes, add professional value to their curriculum and participate in the development of the educational quality strategy of the institution. The project is based on “teaching experience” storytelling, a pedagogic approach used in the development of E-Portfolios for teacher training. INNOV provides teachers with a complete range of interactive tools to share their innovative teaching experiences. The formalized storytelling model allows the fast exploitation of knowledge through the production of various multimedia contents.

The paper combines a purely pedagogic observation of technology learning processes through community building, response to innovation and acceptance of sharing strategies in a professional competitive environment. The study shows patterns in adoption, individual motivation and voluntary participation in content production. The interdisciplinary approach of Web Science was helpful for this study: the paper gives solutions for designing an educational web application for teacher training that takes into account the particular context of the institution and ensures that the focus is on theory of teaching rather than on technology (Wubbels, 2007).

Following propositions made by Halford, Pope and Carr in their Manifesto for Web Science, the study will look critically at the way Web technologies and Web 2.0 business model are used to build communities in the higher education context, in avoiding to create exclusion, rejection or new forms of inequalities.

Categories and Subject Descriptors

H.5.3 [Information interfaces and presentation]: Group and organizations interfaces – Web based interaction.

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General Terms

Design, Experimentation

Keywords

Innovation, Education, Web 2.0, Collaborative projects, Teachers learning, Teaching experience, CMS, Web design, Digital Power

INTRODUCTION

In the *Manifesto for Web Science*, presented by Halford, Pope and Carr at the Web Science 2010 Conference in Raleigh (Halford & Al., 2010), the authors stated that if Computer science was needed to harness Web Science, “understanding the web requires knowledge and expertise from the social and human sciences”. During his intervention at the same conference, Sir Tim Berners-Lee also clearly insisted that if understanding the impact of the Web definitely required the expertise of social and human sciences, Web Science was also about engineering and inventing new solutions to build a better future for the Internet application he created twenty years ago. The presented case-study of the INNOV project will try to conciliate these complementary visions to demonstrate that providing interdisciplinary analysis and comprehension of context and actors strategies is inseparable from technological approaches used for designing a technological solution. The study will also follow one of the core concepts of interdisciplinary research in the *Manifesto*, the point of Co-Constitution: “how the web impacts on what people do and how people impact on what the web becomes”.

The term Web 2.0 was officially coined in 2004. It aims at describing specific characteristics and core competencies of interactive content platforms on the World Wide Web (O'Reilly, 2005). Even if the term Web 2.0 was criticized by the father of the Web for being a “piece of jargon”¹, it is now widely accepted to describe numerous Web-based services and applications including blogs, wikis, Social networks and collaborative platforms.

¹ Berners-Lee T. 2006. Radio interview with Scott Laningham of IBM developerWorks.

In the education world, Web 2.0 applications foster a new approach to learning. The possibility to share educational materials and to imagine derivative projects gives “a wide range of opportunities for teachers to reach specific learning needs and focus on outcomes for a more empowering learning experience” (Pitts, 2009). This does not limit itself to content access: Web 2.0 applications core competencies allow users to benefit from social networking and create conditions for harnessing collective intelligence. If learners can build relationships in a community oriented approach, teachers can also benefit from the development of online professional communities, in a teacher training institutional strategy.

Teacher education will need to approach Web 2.0 on two fronts: As an application to enhance learning in the process of teacher preparation or professional development and as an application to classrooms where teachers will be expected to use Web 2.0 tools with learners (Albion, 2009).

In the new networked knowledge community, three specific types of learning are identified by Paavola and Hakkarainen (2005):

- Learning as acquisition of knowledge by the individual.
- Learning through participation in a social community (informal learning).
- Learning as collaborative knowledge creation.

Literature is very abundant on the subject of Web 2.0 and teacher education. Many articles describe the obvious need for teachers to take advantage of Web 2.0 applications core competencies in building interactive learning contents or develop collaborative projects with students. But few actually take into account the fact that this shift in teaching strategies could be integrated in a larger institutional move to promote rationale use of innovation in university. And this innovative strategy could also be used for teacher learning, collaborative sharing of experience and institutional culture building.

The present paper will explain how the INNOV project was conceived and proposed to the teaching community at Beirut’s Saint-Joseph university. The first section demonstrates that Web 2.0 core competencies can be used to create online professional communities in education that encourage innovative teachers in sharing experience and savoir-faire. In a second part, the paper will describe the design of the INNOV application, its content building processes, and evaluate adoption models by the community. The conclusion will insist on the necessity to contextualize interdisciplinary analysis for the design of this type of collaborative projects.

1. USING WEB 2.0 CORE COMPETENCIES FOR CREATING ONLINE PROFESSIONAL COMMUNITIES IN EDUCATION

The introduction of new educational technologies using Web-based services has modified the way teachers and learners interact with knowledge, content and pedagogy. From E-Learning to digital repositories, the Web has definitely changed the rules of education. Pushed by the combination of always increasing “availability” of the Web, in terms of data storage capacity and speed of access, the core competencies of Web 2.0 as described by Tim O’Reilly have proven beneficial for many aspects of knowledge management in education. The fact that users/readers of the Web have now access to new activities, like sharing

content, commenting, tagging or building mash-ups of information, through highly interactive interfaces has tremendous consequences on classic hierarchies of education. “Pedagogical solutions and means support a shift from traditional educational paradigms towards emerging pedagogical approaches based on our current understanding of learning, such as fostering learner-centered and constructivist processes, and the acquisition of lifelong learning skills” (Forkosh-Baruch, Nachmias, Mioduser, & Tubin, 2005).

New paradigms have emerged from these new opportunities: developing special competencies in using Web 2.0 applications for pedagogical purpose may become a major section of university teachers training programs. Where E-Learning was mostly based on reproducing classic teaching schemes with technological means, Web 2.0 core competencies integrate more complex processes like shared information management and collaborative content production. Changes in the way teachers relate to information sources, trust issues or micro-content require new approaches and the integration of new skills in their pedagogic curriculum. Few universities have integrated this new reality in their continuous education programs for teachers despite the obvious emergency of the situation.

The approach initiated by the INNOV project presented in this paper tries to compensate the absence of institutional strategy regarding teachers training by exploiting some core competencies of Web 2.0 applications. The answer to this absence of strategy could be to harness the power of these competencies through institutional projects, gathering innovative teachers, on a voluntary basis, around an online learning community.

1.1 Architecture of participation

O’Reilly explains: “I’ve come to use the term “the architecture of participation” to describe the nature of systems that are designed for user contribution. (...) And of course, the Internet and the World Wide Web have this participatory architecture in spades” (O’Reilly, 2005). If Web 2.0 can be seen as a set of socio-technological patterns used by Web applications who survived the bubble burst, architecture of participation was inherent to the Web since the beginning. Users were, from the start, supposed to be involved in content production and edition. But technical conditions of access to the Internet in the ‘90s put this web basic feature to sleep until 2003. User contribution adds informational value especially when the contribution is based on a voluntary action. A project that would take advantage of this architecture of participation needs “a small core of well-defined extension mechanisms” (O’Reilly, 2005).

Voluntary user contribution is the core concept of the INNOV project. The available content will be entirely produced by registered users of the project, in order to allow leveled interaction and collaborative construction of knowledge. The main challenge of this strategic orientation is to initiate voluntary contribution: teachers, in the present context, do not have a “culture of sharing” experience, resources, knowledge. The inspiration behind this challenge comes from an existing online community of French language speaking teachers called *Apprendre 2.0*. This community gathers innovative educators from France, Canada, etc. around a Ning website² with the motto “Learning to teach”. Contributions can be posted as articles, blog entries, forums posts or even Twitter messages under a

² apprendre2point0.ning.com

Collaborative Content license. The philosophy behind this community is to take advantage of Web 2.0 competencies to foster collaboration, co-construction of knowledge and sharing of resources with direct advantage for the participant (*the more you give, the more you receive*). The concept is based on Watzlawick's theory of "change 2" (Watzlawick & al., 1967): This change is the only decision that can lead to innovative strategy choices. According to Marmuse (1997), this necessity of change or *reframing* can be compared to the process of *reengineering*. Building an architecture of participation where teachers will freely contribute and share knowledge and content requires to reengineer strategic decision choices, by creating positive conditions for acceptance of change.

1.2 Collective intelligence

Collective intelligence is usually defined as a shared or group intelligence that results from the collaboration or competition of a large group of individuals and appears in consensus decision making. What is obvious in network processes like social bookmarking is much more difficult to develop in professional environment. Benefits are obvious, especially for the organization that takes great advantage in harvesting informal data that would otherwise be unavailable, like company culture or personal opinions. Harnessing collective intelligence allows the construction of mutualization processes. In teacher education, the lack of collaboration has been shown to be "a significant hindrance to developing and implementing innovative teaching practices that involve technology" (Fisher & al., 2000).

Knowledge creation constitutes a collaborative process that involves complex, unpredictable social interactions. Creative knowledge collaboration in education requires assimilating and harnessing the community's know-how and related teaching practices and "engaging in sustained idea advancement that brings valuable novelty to a domain" (Zhang, 2009). Web 2.0 technologies encourage "artistic expression and sharing of personal feelings and ideas through a wide range of digital media" (Greenhow et al., 2009). A Web where participation allows decentralization of knowledge and experience may encourage new disposition among the community that can foster creativity: "openness to change and new ideas, enjoyment of dialogue and collaboration, self-efficacy in creative work, sensible risk taking, and so forth" (Zhang, 2009).

Collective intelligence and creation process have a direct consequence in the educational context: the creation of what Etienne Wenger describes as communities of practice (Lave & al., 1998), "groups of people who share a concern or a passion for something they do and learn how to do it better as they interact regularly."

1.3 More competencies

Literature on Web 2.0 usage for teachers training evolves mostly around the two previous dimensions (architecture of participation and collective intelligence). Other competencies may also be considered for fostering collaboration and participation in teacher's communities.

1.3.1 Long tail phenomenon

Traditional teacher training is mainly based on hierarchical models, with the preeminence of "leading figures" in the institution, always used as references for institutional training or culture transmission. Community online training gives the opportunity for a larger number of teachers to share their experience and deconstruct the existing hierarchy of reference.

Previously unidentified competencies may appear among the community and reveal new directions for innovation or change in practice.

1.3.2 Perpetual beta and Software gets better the more people use it

The application hosting the community (profiles) and the content (experiences) can be launched as a beta version and improve with usage. User's feedback, online evaluation of content, emergent usage rules will systematically provide valuable input for developing new interactive services.

1.3.3 Right to remix and Granular addressability of content

Content provided by authors may take several different forms: text, graphics, multimedia or reference (Links). Every piece of content can be exploited in the community to support co-construction, illustration or even comparison. Reference material is available for remix and reuse under Creative Commons Licensing. Multimedia content is hosted on sharing sites like Slideshare³ or YouTube for larger access and promotion.

2. DESIGNING INNOV

2.1 Project background

The INNOV project is a collaborative online community-building effort launched in 2010 at Saint-Joseph University of Beirut, Lebanon, to mutualize innovative teaching experience among university teachers. This project was designed by two Saint-Joseph university's educational research components, the New Educational Technologies Unit (UNTE) and the Laboratory of University Pedagogy (LPU). The project can be viewed at <http://innov.usj.edu.lb>.



Figure 1 - INNOV's homepage

The project was designed to provide a clear picture of the situation of innovative teaching practices among teachers.

2.1.1 The objectives

The first objective of the project was to create a feeling of community among USJ teachers. Building an online place, where teachers from various institutions would share common language,

³ www.slideshare.net

common practice, learn from each other and create common culture was definitely the reason behind the whole concept.

The second objective was to provide ways of informal training for teachers who don't want to follow professional training sessions generally designed with no regards to local context.

The third objective was to develop a culture of collaboration among teachers, through knowledge sharing, interactivity and cooperative content building.

2.1.2 The context

USJ is a vast university split in 7 campuses around Lebanon, where history and traditions have created large disparities in academic methods and decentralization in governance, despite the fact that the university has adopted a common academic system based on the Bologna process in 2003. Teacher's backgrounds, experience and pedagogic abilities are very diverse and the cultural context may also explain that collaborative initiatives among teachers are very rare.

Technology literacy has improved among teachers community with the introduction of the Moodle E-Learning platform and the creation of training workshops on E-Learning tools and online course development. In 2010, 30% of the academic personnel are using the Moodle platform on a voluntary basis.

Innovative teaching training programs have also been offered to the academic community through the creation of the Laboratory of University Pedagogy (LPU). Between 2008 and 2010, 15% of the academic personnel have participated in a training program proposed by the LPU.

On the technical level, it is important to notice that Lebanon has the slowest household Internet connection in the World, with an average download speed of 0,55Mbps, according to the Speedtest⁴ website.

The project's context was characterized by the almost complete absence of "culture of sharing" among teachers. Even inside the same discipline, teachers are reluctant to even discuss syllabuses or course content. This attitude can be explained by a high level of competition among teachers in a society characterized by a high power distance culture and collectivism.

2.1.3 Story-telling

Asking teachers to "tell their stories" was one of the concepts used to disseminate the project. All communities, however defined, are tied together by stories – anecdotes, impressions, observations and narratives - which map the shape and substance of their 'world'. "In effect, a community is a diverse garden of connected stories; the more deeply one knows the stories, the more deeply one knows the community" (StoryGarden)⁵. The story-telling format deconstructs the traditional frame used for scientific publication: no control on formatting, no boundaries for types of content and a free narrative flow will lead to simple explanations, clear examples and better sharing of experience.

2.2 Project design

INNOV's design follows the logic of Open social software. Open social software is defined as software that enables people to

collaborate, interact and connect with each other using software whose source code is public and so can be used, modified or re-distributed by its users. Following core competencies of Web 2.0 application design, INNOV must use lightweight programming model, essentially an Open source CMS. To limit the risk of creating technical barriers between inexperienced teachers and access online community, the choice was made to use a WordPress⁶ platform, with a specific theme design. The CMS was installed on the university Web server, despite the poor quality of connection available, especially on upload speed. Heavy content, like audio or video, will be hosted on external platforms and integrated through plugins in WordPress. All usability aspects of the INNOV site follow the strict rules of User centered design (UCD) and user experience design (Morville, 2004). It was a prerequisite of the project that authors should not have to participate in any kind of training on the Web site before being able to contribute freely. The WordPress theme and the back office interfaces were documented for immediate reference in case the author would need help. The INNOV Web Site complete contribution procedure was documented on a PowerPoint presentation and a video that is available on the site.



Figure 2 - User experience design (Morville)

2.3 Structuring content

Project design was articulated around two main questions: how content must be built, articulated and presented in order to be sharable? What level of editorial control must be set to guarantee quality, but also develop trusted participation? Describing a teaching method is not an easy task. It has different levels of implication: the teacher himself/herself, his/her motivation, his/her personal background, the discipline, the context, the method, the objectives, etc. Following the decision that content will be created using the "story-telling" format, a list of topics was produced that would have to be included or used as a backbone for the contribution. It would create a common readability for all entries; guarantee a minimum coherence without the inconvenience of having to "fill a form". The chosen structure for every submission was the following:

- Context
- Objectives
- Tools
- Special competences
- Steps
- Evaluation

⁴ <http://www.speedtest.net/>

⁵ <http://www.storygarden.ca/>

⁶ <http://www.wordpress.org>

The WordPress template was then designed, plugins were installed to improve interactivity and allow more flexibility in publication and content display. The blog was divided into 2 main sections, "innovative methods" and "resources", both accessible for contribution by users. External references (links) were also available on every page.

The innovative methods were organized in categories. Authors can place their contributions in existing categories or create a new one. Keywords were also created directly by the author, when writing is contribution.

2.3.1 Contribution Process

The INNOV Web site is managed by a team of university pedagogy specialists, all members of the Laboratory of University pedagogy at USJ. This team acts as an editorial board, but respects the basic principle of architecture of participation: no direct intervention in the contribution. Edition is accepted only for moderation of illicit content or technical issues.

Authors must register to the INNOV Web site to contribute. Registration is based on USJ teachers ID, to authenticate academic personnel according to their institution, their discipline and their status (full-time teacher or part-time teacher). INNOV is connected to the university LDAP authentication system for common access to all interactive applications. After registration, authors have access to their profile on the WordPress CMS and can immediately start writing their contributions.



Figure 3 - Example of contribution

3. IMPLEMENTATION

3.1 Building the community

Davis and al. (2010) made the following comment in their article about the EdShare platform: "While a suitable, appropriate, and usable technical infrastructure is an important component of success, it is widely acknowledged that major barriers to further progress are human rather than technical as factors" (Davis & Al., 2010). Building the community was the hardest part of the project, mainly for cultural reasons (See 3.1.2). But the Manifesto for Web Science (Halford & al. 2010), critically thinking about the Web, states that "the Web is co-constituted with society in

heterogeneous networks that are both challenging and reproducing older forms of inequality and producing their own varieties of inequality". This effect can easily be observed on the micro level among a group of university teachers: choosing the Web to build a community of knowledge and experience is a decision that may create inequalities. Computer literacy, condition of access, difference in usage or perceptions can prevent teachers from joining the community. New hierarchies lead to new forms of power and teachers with better understanding of the benefits of such systems have a direct competitive advantage. To avoid this negative effect, the INNOV project was designed following a strict usage context analysis, following direct observation on user's competencies, computer literacy and perceptions.

The following process was adopted to start community building. A first group of 5 innovative teachers was identified to submit the first five contributions. These contributions were selected to show the flexibility of the system, in terms of diversity of formats: video, audio podcast, PowerPoint presentations, Acrobat PDF documents and photos were included. Following a selective call for contributions launched with the support of the university, a second group of teachers was selected to provide "basic" contributions, with almost no help. This second group was very helpful in testing reports and global feedback on the project. The INNOV project was officially launched to the whole teaching community, with a larger call for contributions and comments on existing contributions. The official presentation of INNOV was organized during an institutional event (Innovate & Enseigner 2011 – Innovate & Teach, 2011) that gathered teachers, academic staff and officials from the different institutions composing USJ.

3.2 Adoption

Gilbert (2002) explains that low threshold applications are (a) easy to learn by both teachers and students, (b) not intimidating to require re-examination of epistemologies and teaching practices, (c) simple enough to require little technical training for use and (d) almost ubiquitous. These criteria apply to INNOV. Reception by the academic community was very positive, even if some teachers were dubious about the possibility to really create an enduring project around online collaboration and experience sharing.

After a first experimental year, the INNOV project is now open to the entire community and 30 teachers are already contributing to the site. Non-contributing users propose resources, they download content, they comment on contributions. It will take a second year for teachers to get accustomed to the concept and to start providing content in a more collaborative manner. It's a global trend of web 2.0 services to start as "services" before users start to really contribute with content.

INNOV is just at the beginning of its existence, and if it raised interest and curiosity, it also faced criticism and rejection. Deconstructing hierarchies in organizations, using popularity as an asset, sharing unedited content, learning from others, are very new approaches of institutional collaboration. And they follow the basic levels of the Concerns-based Adoption Model (Hall, Loucks, 1976).

3.3 Contributions

Contributions statistics show some interesting patterns: The largest contributing discipline was medical science, including medicine, dentistry, nursing and pharmacy, followed by education

and engineering. These three disciplines have, at USJ, a tradition in innovative teaching, university pedagogy development programs and also the largest number of full-time academic staff. Leading innovative teachers previously identified by the project have proved to be the best contributors. Instead of keeping their experience for themselves and protecting their competitive advantage, they decided to share their knowledge in an unexpected move, considering the highly competitive environment of the university. After conducting direct interviews with the main contributors, it was possible to draw a clear picture of the reasons behind motivation. American journalist Clay Shirky explains the reasons why people for both personal and social reasons act on a voluntary basis: “Private motivations – the imperative or need we have to feel autonomous, competent and skilled human being and Social motivations – the need to belong to a group is another motivator, as well as the need to share”.

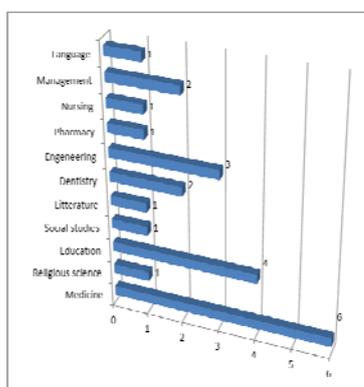


Figure 4 - Contributions by disciplines

These two motivations apply in the INNOV case. For cultural reasons in the present context, belonging to a group is a way to define oneself at the professional level. Scientific recognition by university pairs is another reason for motivation: many contributors are young teachers in search for academic recognition. A fourth motivation may be called “invisibility”: some contributors have a long experience in innovation; but they never really made a difference on the professional level. Having the chance to share their experience and put it in broad daylight is an opportunity they didn’t miss. Davis and Al. encountered the same kind of “selfish motives”: “Sharing in the greater, altruistic sense seems to be a side effect of more pragmatic selfish motives, and it is well understood that the majority of users who take part in a community will not necessarily contribute”.

User’s contributions also take the form of comments. More than 100 comments were posted on the INNOV Web site by USJ teachers (registered users) or Web users. Most of the comments were direct questions to the author concerning practical details on teaching experience. Even if some authors were afraid, at the start of the project, that the comment form may trigger flame wars or direct criticism of the proposed experience, no comments actually targeted contributions with negative evaluation.

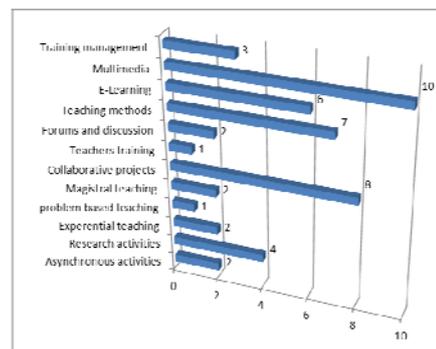


Figure 5 - Contributions by subject

3.4 Next steps

INNOV has been online for a year. Usage statistics provided by log analysis shows that the number of visitors is continuously increasing. April 2011 witnessed an average of 168 unique visitors per day (120 for January). 57% of these visitors come from outside the University’s IP address. New contributions are added on a regular basis. The INNOV Web site is now frequently cited by colleagues in the University and awareness is growing thanks to frequent e-mail campaigns launched to advertise new content or new contributions. Institutional support is growing and authors start to receive positive comments from the academic hierarchy for their participation in INNOV. The application will improve thanks to new interactive services and links to parallel systems like Zotero or the Moodle LMS.

4. CONCLUSION

Creating an online community where university teachers would freely explain their innovative teaching methods and share their experience in a very competitive environment, where culture barriers, technical problems and institutional coldness define the project’s context, was a real challenge. Interdisciplinary approach was necessary to set up and design a simple Web site that can be adopted by university teachers as a platform for collaboration. It was also necessary to understand the characteristics and core competencies of Web 2.0 applications and join them with the requirements of a pedagogic community. Web Science is about creating approaches that allow new powerful and more beneficial mechanisms to occur. The deciphered mechanisms behind voluntary participation in an online educational community show that the impact of the Web still needs to be fully understood.

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