Course-centric vs subject-centric vs community-centric approaches to ICT-enabled learning settings

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The paper presents a discussion on the different approaches that we have found in learning settings respect to ICT platforms that support the educational activities. Three are the main approaches: LMSs, where the course is put at the center of the system, social networks (like Facebook™, Twitter™, Flickr™ etc) where the subject with her network of social relationships is put in the center of the system, and virtual communities systems, where the core paradigm of the platform is the (virtual) community that offers specialized services for the purpose of the community to the enrolled members, and where the subject is just a participant that adheres to the rules of the community, with duties, rights, tasks to do and objectives to achieve. We will discuss all these three approaches, the different levels of applicability in learning settings, and specifically the potential of the virtual communities-based approach that we adopted in the experimentations conducted in the last ten years.

Keywords: e-learning, virtual communities, social networks

I. INTRODUCTION

In this paper, we will present our experience as designers, developers and administrators of a virtual communities management system, called “Online Communities” that we are using in learning settings since 2002. Initially, the platform has been substantially used as a replacement of an e-Learning system (LMS) used by the Faculty of Economics of the University of Trento, as at the time we have no low-cost, widely used LMSs like today. We recently managed the evolution of the system towards the provision of what we called a “Personal Learning Space” to the user. This approach is, at first sight, quite similar to the web 2.0 and social networks interaction spaces. In this way, we passed through the three different possibilities that are used today by educational institutions to support educational settings: Learning Management Systems (LMS), Social networks and Virtual communities systems.

LMSs are software platforms where the “course” is put at the center of the system, and the user finds herself “included” in a box (the course) where educational activities are available depending on the decision of the teacher. These well-known software platforms (like Moodle™ or Blackboard™) put the “course” at the center of the system, adding services and tools for expanding the capabilities of the system to support learning and (sometimes) collaboration activities. Accordingly to this, these systems substantially have a “course-centric” approach to service provision, as their original main purpose, where the whole architecture of the system is grounded, is to support educational tasks,

Social networks (life Facebook™, Twitter™, Flickr™ etc) are web sites where the network of social relationships of the users is put in the center of the system (or better, at the center of the interest of the owners of the platform). The incredible success of these social network platforms, has convinced some educational institutions, teachers and tutors to use them for educational purposes. On the research and experimentation side, researchers of learning and teaching techniques based on new technologies have been naturally attracted by the many possibilities offered by the evolution of the ICTs towards social settings. The main reason for this is probably the widespread conviction that the learning process is a social phenomenon. Normally, some shades of this idea exist, from strong positions like “learning is a social process” to lighter positions like “learning is also a social process”. In general, there is an agreement about the social component in the learning processes, and therefore it is almost automatic to assist to the great debate around the so-call e-learning 2.0, as an evolution of the old-style e-learning 1.0 (first generation of e-learning) towards a greater social and participatory sense.

Here we would like to distinguish the power of social networks in the literal sense, as a social phenomenon in e-learning, from the implementation of this sociological concept that Web 2.0 has done. On one side, we have a network of people collaborating to a common objective, managing relationships and exchanging their experiences, and this is a long studied concept in sociology that in recent years has been updated thanks to ICT-mediated networks. Another perspective is the usage of these software platforms (with concepts like “friendship”, “friends”, “groups” as building blocks of the interaction) in educational settings. To us, it seems that some educational institution is using Facebook™ and similar platforms more due to their success among young persons, rather than a precise and well-designed usage for educational purposes. Of course, we are not denying the enormous potential of social interaction in learning settings: the Web 2.0 and e-learning 2.0 are building blocks of many educational activities, but we would like to distinguish the concept of social network, collaboration, and all web 2.0 services (blogs, wiki, user-generated contents etc.) from the implementation that has been done in social network platforms, and from the usage that (due
to this implementation) the educational institutions are doing with them.

The third approach is the one that we conceptually adopted in 2002, in order to get rid of the rigid metaphor of “classroom” or “course” typically implemented in LMS, and to “anticipate” the social network phenomenon just for the small part of the usage of collaboration dynamics in learning settings. What attracted us was the collaboration metaphor in the idea of “virtual community”, as originally presented by Rheingold in 1993[1]. So we decided to build from scratch a software platform that implemented “by design” (and not “by derivation” or solely due to hype) the concept of a “virtual community”, as a set of people aggregated around a common interest that will use ICT-based tools to interact. Virtual communities systems are therefore those systems where the core paradigm of the platform is the (virtual) community that propose services to the enrolled members, specialized for the purpose of the community, and where the subject is just a participant subject to the rules of the community, with duties, rights, tasks to do and objectives to achieve.

In this paper we will introduce the problems related to the integration of these different logics (learning spaces social networks and virtual communities) into a single software environment, and how to connect these different worlds into one single architecture. We will describe the developed solution, together with some implications of these choices onto the system, named On Line Communities. The system provides the idea of virtual communities as pillars of the interaction mechanisms provided by the platform to the users. This revealed, in our opinion, on one side the limitations of tradicional LMS, and on the other side, the inappropriateness of social networks as pure platforms for supporting learning activities. On Line Communities was designed to allow a continuous exchange of experiences among its users; in that sense, a change of the core of the system towards a “social network” approach is, in our opinion, by far easier than doing the same changes in LMSs that adopt different metaphors (the “course”, or “classroom” instead of the “community”). By having the metaphor of “community” as the pillar of our system, we are able to:

• easily integrate social network tools (blogs, wikis, etc) as they are based on the concept of “community” and not on a specialization of it, i.e., “classroom”.

• provide additional services that improve the concept of “social network” and “community”.

The Learning management systems (LMSs) are normally used by educational institutions to manage the training activities. These systems use the network to create different learning environments related to the learner needs (distance learning, blended training, back-end activities management related to training processes, etc.). As any other type of management system, these applications are also connected to the management model that is represented in the software. In the case of e-learning applications, the represented model is the way by which the institution conceives its learning / teaching processes. The simplest model is the one used in distance learning, when the system becomes a container of learning objects, designed to be effective in the students self-learning processes, the remote control of the current level of learning, the certification of the results achieved and the management of the organizational / financial relations with the training institution.

Much more complex are the systems oriented towards a blended approach. In this case, the LMS offers a virtual space corresponding to what is carried out in the real didactical institution. In this way, the student learns not only in the traditional courses (in the classroom) but also using the virtual space as a reinforcement to face-to-face lectures. This model is the most widely used by the academic institutions. More complex are the systems that tend to support innovative forms of learning such as learning by project, learning by problem and cooperative learning. In this case, the LMS must provide not just a virtual space associated with a course but also special virtual spaces able to work with other similar environments.

The LMS evolution from simply content containers to real cooperation spaces is now in a new phase of transition. The spread of Web 2.0 applications provides the possibility for these systems to evolve and support all those forms of learning excluded from the classical formal and institutional learning methodologies. It is trivial to note that the interrelationship between formal and informal learning includes new challenges to the educational institutions and also to the change of the LMSs’ architectures. In this paper we present the solution that we have implemented, i.e., a technological integration between the e-learning processes and the current aspects of social networking into a robust, virtual community-centric platform.

The paper is organised as follows: in the first part we will describe the LMS developed for the University of Trento, named On Line Communities, and its evolution from a e-learning system based on the metaphor of course to a more complex virtual environment based on the metaphor of virtual community. In the second part we will introduce the current study of our research group directed to the integration of the social networking aspect into our environment. In particular we want to underline the risk of a direct adoption of a social network logics into an academic environment, and what could be the correct strategy for the integration of the two types of approaches into a “bridge” platform.

II. ON-LINE COMMUNITIES

In the academic year 1999/2000 the Faculty of Economics of the University of Trento decided to have a software system able to enrich its traditional teaching as an extension on the Web. The first aim was to handle the increasing number of teachers’ personal web pages into a single platform. To pursue this result it was necessary to have a Learning Management System (LMS), capable of supplying a virtual environment able to support the educational courses of the Faculty. The resulting system started to function from the second half of 1999 and during this period, the system counted approximately 1,200,000 accesses. Being a quite traditional LMS, in 2002 some observation convinced us to redesign the software. Conceptually, the “pillar” of the platform, i.e., the core component of the system for the idea of enrolling people to a “course”. The original system was therefore based, like many LMS today, on the concept of “e-course”. In this way, modeling teaching / learning (such as learning by problems,
learning by projects, cooperative learning and their combinations) could hardly be connected to the e-Course, especially when the software directly represented the metaphor of traditional courses. Substantially, every course offered by the institution was associated to a virtual space available via web. In this virtual space some services were available to participants, in order to extend in the virtual the typical interaction student-teacher of the real classroom. The experimentation, as said, gave us a lot of indications regarding the limiting factors of this approach.

First of all, limiting the collaboration to two subjects (teacher and students) without involving the rest of the information system of the organization was a serious drawback. The needs for cooperation within the academic environments is extending to all the activities that constitute the context in which didactic takes place, not just to the specific “lecture” or “course”. In an academic context, not everything concerns teaching: for example, the entire faculty is more than a container of degree courses and a degree course is more than a container of lessons. Another item of afterthought derived from a consideration regarding the didactics of an university, that are not built only as a set of studies and tests, but these activities are inevitably intertwined with the university’s organization and its information system. Moreover, the organizational didactic scenario changed with new regulations made by academic institutions, and these changes inevitably reflected on the LMS functionalities. It is important to note that these types of changes are usually the result of a debate process in which both elements of cooperation and negotiation interact.

To answer these (and other) needs, another founding paradigm was needed, with at least four basic new elements:

1. a new definition of collaboration virtual space, generalized respect to what traditional LMS were offering for educational settings;
2. a new definition of the users’ role in a community, based on the concept of duties and rights inside this virtual space
3. the virtual space thus created should be generalized, suitable to support not just strict educational activities (like a “lecture” or a “course”), but more extended and complex processes like cooperation and collaboration;
4. the capability of modeling and preserving organizational structure and roles of the educational institution, for example in hierarchical structures like university-faculty-degree-course hierarchy, or any other organizational, network-based structure (like social communities)

This new way of conceiving the collaboration platform was found in the concept of virtual community. The system that arose, called On Line Communities [2], was born in 2003 and was deployed for all users in February 2005. Nowadays, among the different sites and public institutions where it is used, it counts approximately 20,000 users and a rate of 40,000 unique accesses per month.

The collaborative approach [3][4] is a very strong incentive for us to develop On Line Communities; what led us to rebuild the system to supersede LMSs limitations is to allow the exchange of users’ experiences within a virtual environment, and within well-defined areas known as “communities”. This approach is very different, for example, from the traditional ones available in other LMSs. Our work started before the boom of web 2.0 [5], that has now invaded and changed the way people think and build services on the net. From a technological point of view, trying to re-interpret the structure of our platform under the light of social networks, we could say that “Online Communities” can be seen as a social network specialized in the domain of learning activities. Nevertheless, due to the profound conceptual, design and technological starting points and approaches, some relevant differences exist between our platform and social networks on one side, and between our platform and LMSs on the other side.

The core of the application is composed by some abstract entities, i.e., VCs as aggregation of people to which some communication services are available in order to obtain certain objectives. With this approach, it could be possible to represent all the hierarchical relationships between different types of educational communities (such as Faculties, Didactic Paths, Master Degrees, Courses, etc.), as any other relationship among communities inside organizations.

In a nutshell, the main characteristics of a community could be summed up as follows:

- Each Community offers many services to registered users that have different roles/permissions inside the community
- The services are general applications that enable users to communicate both in synchronous and asynchronous way, to publish contents, to exchange files, to coordinate events, etc.
- Services offered by a community are activated by a manager of the community according to the needs, and the users of a community can use them with different rights and duties.
- Rights/duties in the community are different from rights/duties for the services
- Communities can be aggregated into larger communities with hierarchic mechanisms and infinite nesting levels. Communities can also be aggregated in an arbitrary way into larger communities disregarding the possible position of a hierarchical structure, in a sort of “transversal” link that overcomes the concept of “hierarchy” and follows the idea of “mesh”. Thanks to these features, a complex but powerful mechanism of propagation of services/roles/permissions/rights/duties can be set among communities of the same branch or of different branches.
- All users are recognized by the system and by the community; people external to the system can see public part of the community (services, material, contents etc.) only if managers allow this (ex. a blog of one community could be opened to external contributions)
- Services can take advantage of the “mesh” structure of Online Communities to provide some interesting though non-existing features, like “transversal wikis”, or “merged blogs”. One blog, in fact, can be the “fusion” of all the blogs of children communities, or a wiki can take the definition transversally from all wikis in related communities.
- Last but not least, a VC is the container for collaboration processes not limited to educational activities, but for any collaboration activity needed in an organization. Research teams, recreation groups, friends, meetings, conferences, secretariats, board of directors, colleagues, next social
dinner, anything could be an aggregation of people around a scope that can take advantage of the virtual spaces offered by the Virtual community.

III. SOCIAL NETWORK AND LEARNING SETTINGS

The collaborative approach described above [6][7] represented a very strong incentive for us on the development of new versions of “OnLine Communities”. The philosophy that led us to rebuild the system was to allow the exchange of users’ experiences into a virtual environment, and within well-defined areas known as “communities”. This “community-centric” approach is very different, as said, from the traditional “course-centric” one, typical of other e-learning management systems. The boom of the web 2.0 that changed the way people think and build services on the net. The “social” approach adopted by Facebook™, LinkedIn™, YouTube™ or Twitter™ is very interesting, and according to statistics, it involves an increasing number of web users[8]. Such services facilitate the bi-directional communication and the exchange of experiences between users, but on the other side can hardly be applied “tout court” to e-learning experiences. For example, students or teachers are “forced” to use blogs inside the “classroom” most of the time due to the lack of more appropriated tools. Many teachers used blog platforms because they did not have any other place to create a “diary” of the lectures, with teaching material associated to each lecture. However, in principle, a blog is a personal diary, that contains ordered-by-date comments on personal facts. The “experiential” component is relevant, respect to the usage of it as a repository of PDF files. Also students, that probably know better than us the role and scope for which blogs should be used, most of the time are not so comfortable in “participating” in a blog when used in educational settings, if not for curiosity, dictation of the teacher, trend or simply in order to have access to course information and materials. Of course, we are not denying the usage of blog as a very interesting, participative experiences (we built a blogging tools in our platform). We are simply saying that due to the eclecticism of web 2.0 tools, when the appropriate tools are lacking, people involved in educational tasks use what they find to be accessible, quick and easy to use. Thus, a blog (or a social network personal home page, or group) can be used as the classroom registry where annotating the lecture’s topics. If we finally add to blog’s posts the capability of associating uploaded files, we can have a very simple but efficient LMS with just one service. Quite strange, but we are not surprised to see teachers that use their one private blog or facebook page for coordinating and distributing educational material. So, forcing web 2.0 services to become e-learning services in an e-learning platform is a hazardous operation: the result could be a loss of quality in the learning process (like any usage or unappropriate tools for certain context), confusion, workarounds and possibly users’ dissatisfaction. Of course, if you consider e-learning just as distributing PDF files to students, most of these tools are instead perfect, but this is not our perspective.

Following these considerations, another component of the Web 2.0 phenomenon has attracted people operating in educational settings, i.e., using social networks as teaching / learning platforms. Our consideration is more or less identical of the above consideration regarding the usage of blogs, but due to different perspectives. According to some recent statistics [8], the majority of users who use the so called “social networks services” are concentrating on the well known “peoplesurfing”: navigate into the friends’ profiles, see pictures, personal information, etc. Voyeurism and curiosity behind the success of these applications? This study seems to suggest this scenario, but what interests us is that they are building a private community of people around their own interest: exactly the definition of “virtual community”, and not the definition of “classroom”.

We are aware of the clear phenomenon that is emerging from friends’ social network [9]; it is true that the action of adding a person to the friends’ list requires an approval, but it is also true that a user can see at any moment the people connected to his/her friends, and there is no approval mechanism on others’ friends. This opportunity on one hand could be positive, but on the other can be critical within a learning context (within a university, but also within business contexts). Once again, our virtual community approach solves (in our opinion) this problem with this “self reputation” capability of moderated virtual communities. The person that enters a virtual community in our system is authorized by the community administrator, and from that moment the person is in contact automatically with the people inside the community. This is the pillar of the virtual community: I’m in the community because I share the objectives of the community. So I don’t have to declare, accept, or manage my contacts inside that community, and I’ll be never connected to a friend of a friend of a friend. Of course, Online Communities allows the users to manage friends’ lists, but this is different from managing community members. The differences between “friends” and “community members” is very clear, and the platform with its security mechanisms based on roles / permissions / rights / services allows the user to manage these two different concepts.

Given that the increase of the social interactions is not a negative aspect, the risks coming from the direct use of Facebook’s approach into an environment with different aims (something like “I’m a friend of a friend who was the friend of my friend. . . .”) are complex to be evaluated. A critical consequence is to become implicitly a friend of my contacts’ friends, thus starting a sort of recursion in the friends’ list of friends.

We have therefore considered the best part of social networks (the services) but starting from re-thinking our system with a consolidated view on the virtual communities with some “social” extensions, changing our community system to a sort of “community 2.0” system: we like to define it as a “Private community Environment” (PCE).

As seen above, our approach is not the pure “classroom-based” approach of LMSs like Moodle™, nor the generalist
approach of social networks like Facebook™, halfway between the traditional learning environments and the social network applications. A PCE does not accept the simple subscription; it requires you to enter into a community in order to interact with others. A PCE is not usable just for e-learning related activities, it allows you to create a community (for example):

- to manage your next scientific conference with your research team and any other person involved in that conference;
- to collect opinions around the next meeting of the Board of Director, where the meeting IS the virtual community, the virtual space inside which the participants to the meeting will have, with different roles ranging from the secretariat to the President, the various services of the community at their disposal;
- to aggregate in a virtual space those people interested in supporting an organization of volunteers for healthcare assistance, to discuss with doctors the problem of applying pain therapy to patients.

By the way, such a virtual space could respond simultaneously to all of these instances, but also to “simpler” issues related to educational scopes; the didactical needs and the improving of the interaction level necessary for the development of a participative environment. Online communities is therefore an alternative to both systems, better positioned (in our opinion and experience) to solve collaboration problems of people that want to be supported by ICTs.

The community metaphor helps us to follow this type of approach; in fact, it is very similar to the metaphors used by the most popular social networking services, but it is also different from what is used in the traditional LMSs. Generally, the increase of the social interactions in learning is never a bad thing, so using a tool that makes social interaction so easy is surely a good experimentation. The integration between a learning space and a social space could also be positive because it reinforces the idea that learning doesn’t just happen in privileged spaces, but learning can happen anywhere and without the intervention of an “official teacher”. This allows us to integrate the learning activities in a broader context that students are interested in, because the border between “learning” and “life” isn’t so distant.

**Figure 1:** On Line Communities and the other systems

The circumstances that we consider favourable in our system (lack of anonymity and control of the external accesses) have origin in two explicit requirements of our Faculty of Economics. The exclusion of anonymity is the result of a belief, that normally indicates that the anonymity into virtual learning environment should be banned, so that the actors cannot shirk from their responsibilities. The second circumstance (access control) stems from the will of a substantial number of teachers to block the publication on the network of their own courses’ Learning Objects. These choices made the system impermeable to the users’ social dynamics, or to the communities existing in the social networks.

To overcome these limits without affecting our constraints requires a radical change of the system architecture, that sees the person as a member of one or many communities. On the other hand, in the web 2.0 applications, the participants exist as individuals who, for example, can create themselves a specific community. The rethinking of the system with these ideas, could change our community system to a sort of “community 2.0” system: we like to define it as a “Private Community Environment” (PCE). The difference between the two approaches is that the communities in our systems are created as an extension in the virtual space of real didactics. On the contrary, in web 2.0 social networks, virtual communities emerge from the interaction among users’ own networks.

### IV. Learning and Social Networks: two strategies into a possible architecture

If we look at the whole range of application fields where we are using On Line Communities, the platform clearly evidences its nature of a collaborative environment that wants to stimulate the participation and put to value users’ cooperative work. Today, with the advent of new communication and collaboration paradigms, On line Communities has become an example of a computer support cooperative work system (CSCW) devoted to teaching/learning. In recent years, we extended our system to functionalities and services typical of Web 2.0. However, some relevant differences exist between the approaches used by web 2.0 applications and the ones used in On Line Communities. To overcome these differences, a changing of the rules used in the virtual space is required, and these changes have a direct influence on the entire architecture of the system.

The cooperative virtual space of On Line Communities is actually a closed environment. The users participate to the activities inside the system directly with their real identity. In fact, a person who enters a virtual community of our system is authorized firstly by the platform administrator (for certifying user’s credentials), and after by each community administrator for each community the user wants to enrol with. Once the user is accepted inside the community, from that moment he/she is automatically in contact with all the people inside the community. This is the pillar of the virtual community: as said, I’m in the community because I share its scope, and all the people of the community have more or less the same interests / objectives / tasks. Following this logic, the user is not obliged to declare, accept, or manage his/her contacts inside that community: s/he will never have to face the “domino” effect of friendship typical of most social networks.

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Following this line, we studied how to modify the architecture of our system, as we wanted to implement the good part (from our perspective) of the incredible revolution introduced by social networks. We wanted to transform our virtual communities platform into a sort of bridge system between the classical methodology followed into the most famous LMSs (like for example Moodle [10]) and the new web 2.0 and social networks applications (like for example Facebook, MySpace and Flickr), without losing the focus on the learning processes.

On one side, this solution give to the user more freedom than into a classic LMS, but on the other side, it is more difficult for didactic institutions to be implemented. In fact, while the institutions are becoming a knowledge centre through the participation of its members, at the same time they are being exposed to the risk of the complexity and the personal relationships of its members.

According to this solution, it is important also to develop a new interface of the Personal Learning Space of each user; the metaphor of community makes possible to implement some interesting features, directly connected to the user and his/her list of contacts. In other words, this gives the possibility to the users to manage their own learning spaces: in some way to enable the users to create a “Personal Learning Space” for their needs. Each user will have the opportunity to access to his/her personal page, which will contain personalized services. As a result, some interesting new services can be provided, for example:

1. access to communities where the user was registered;
2. view the most used services by each user;
3. access to contextual services for each community;
4. access to the personalized services;
5. add some services into the personal learning area.

The user can access to the list of communities where s/he is enrolled in, because this is the primary scope of connecting to this system. But together with this, the user finds a set of services that are typically connected to his/her own person, a sort of personal space within the system. The services are “general”, so in this condition the user will see services that are at “personal” level. This can be repeated and nested when the user enters inside a community: he will find (more or less) the same services, but this time these will be the services of that community, with different permissions, roles, list of contacts etc. A typical example is the Blog service: when I’m inside my PLS, the Blog is my blog, when I’m inside the community “workgroup XWZ”, the service Blog refers to the blog of that community; same service, totally different context and contents, totally different the role of the user could be. Finally, thanks to the inheritance mechanism among communities provided by the platform, the blog of that community can be merged with the blogs of parent community/ies, or with the child communities, or with sister communities (children of the same parent community).

V. EASE OF USE

In this paper we presented a summary of our research activity in learning settings, where we faced with three different approaches to provide support to learning and teaching activities. The first possible approach is the one based on a “course-centric” vision of the learning processes, where every activity done by users is located around the “course”. This is what we saw implemented as a main metaphor in Learning management systems. A second possible approach is a derivation of tools and services made available by social network platform, where we read a subject-centric vision of the learning processes. This approach is found inside those

![Figure 2. On Line Communities as a bridge between two different approaches](image)

The architecture that we developed has two fundamental goals: a) to make our system more permeable to all experiences that take place inside the web, including applications for social networking and Web 2.0; b) keep control, up to a certain level, of the actions taken by users of our system. In fact, our context is connected to learning environments / academic settings, and not directly to leisure time.

Following these approaches, many drastic changes have been introduced into the platform, moving the focus from “community” to “user”. As an example, when the user connects to the system, the user’ personal home page and its services are presented, trying to create a real Personal Learning Space (PLS). We are imagining the new users’ Personal Learning Space as an aggregation of two distinct environments. The user will be free to decide what part of his/her relations and contents to import (into On Line Communities) or export (to social networks applications). From a technological and management point of view, this approach presents more problems than solutions. This solution also required a strong review of many parts of On Line Communities, and in particular the management of users’ roles and permissions.

![Figure 3. The representation of the new architecture](image)
learning experiences where social networks are used as virtual spaces for implementing the interaction between teachers and students. A third approach is the one used in our implementation, called “Online Communities”, i.e., a community-centric approach. The system provides a virtual space where collaboration, communication and learning-specific tools and services are available for the participant to the community. The community is the center, the subject enrolls in the community depending on her interests and needs. The community therefore could be a course in educational settings, but could also be somethings not necessarily or specifically related with educational activities, or can be equipped with services that implement different collaboration mechanisms respect to traditional learning settings (download material, read a forum, do a questionnaire etc.)

We experimented the “long and winding road” of architectural choices, needed for taking full advantages from all these new approaches and suggestions coming from our experience on the field and from what the web 2.0 was introducing. Moreover, by coupling this web 2.0 tools with a virtual communities approach, rather than the traditional “course” metaphor, we obtained many advantages in the possible services provided to end users. In particular, it was evident that social applications are profoundly different from what is provided by traditional e-learning applications. Our system, originally followed a logic of blended learning, was also focused on the metaphor of the course. The evolution to a different metaphor (the community), has opened new perspectives, different from anything that can be seen as formal learning. Our focus on integrating web 2.0 and social network services, increasingly common in the worldwide web, seemed to be quite naturally.

VI. REFERENCES


