Parma Co-Lab: organizational challenge for research and learning.

Introduction

In the present knowledge society, it has become increasingly important to examine how learning takes place and which educational methods can be used. There is currently widespread use of network and technologies, such as dialogue and social environments for collaboration, confrontation and exchange of opinion. Thus it would seem more profitable to consider technologies alongside knowledge and the culture for learning (Valla & Monaco, 2012); (Hutchison, 2006). Indeed, informal learning amongst peers in the academic environment as compared to formal training in the workplace, has been found to be an important yet complex aspect worthy of investigation (Boud & Middleton, 2003); (Boud, 1999).
Koenig & Neveroski (2008, p. 243) examine the development of knowledge management, and identify, in the second stage, communities of practice (CoPs) as a way "to facilitate the sharing" of knowledge. In this paper the term 'knowledge' is used to refer to a dualistic and fluid social process leading towards learning. Emphasis is placed on the organizational context of sharing and learning. Clearly technology is a means with which to share knowledge and support learning, but this is not what knowledge management is about (Hildreth & Kimble, 2002). Collaboratories have originated in different forms with a view to answering to the demands of a scientific exchange of knowledge (Bos et al., 2007); (Lunsford & Bruce, 2001); (Wulf, 1989). The question therefore arises, in the situation examined here, as to whether a group of professors, researchers, technicians and students at the University of Parma can regularly, albeit informally, share knowledge and collaborate in 'two spaces' (Li, 2000); that is, both locally and in an electronic environment, to the mutual satisfaction of one and all.
The primary aim of the study is to understand how the spontaneous gathering of professionals is likely to create a knowledge creation and learning environment, and how they will undertake their activities. In particular the objectives are to:

- describe the origins and foundations of UniPR Co-Lab as a collaboratory;
- provide examples of activities carried out inside the UniPR Co-Lab, that have been recognized in the literature as developing practice inside a community;
- gain an understanding of how members use the opportunity to share knowledge in a cross-discipline environment through initiatives, practices, laboratories;
- examine the interactions among members and gain an understanding of benefits, impacts and possible problems of the formation of a community overcoming institutional barriers inside an academic hierarchical organization.

As Wenger (2011) has suggested, the challenge is to bring about collaboration in a community that comprises diverse personalities, competences and experiences; this can itself be considered a strength, as long as it is accompanied by mutual recognition and understanding of the domain, and acknowledgement of the fact that the value of the enterprise is based on the engagement and display of individual identity in their work. A further aim is to understand whether this group shows the characteristics of both a collaboratory and a community of practice. Would it be necessary for such a diverse group to share the same approach to theoretical models? Would they be able to adopt a methodology to facilitate flexible and rapid co-operation? (Millen et al., 2002) list five major community themes emerging from their analysis: development path, membership, activities, organizational support and value. The first three are considered here as related to the Co-lab. Value in terms of benefits for members, problems and possible solutions could emerge from the narration of activities and experiences.

This paper attempts to address the points noted above by reporting on the real experiences and cases of the Co-Lab at the University of Parma, which demonstrate the application of e-learning concepts to the existing educational and research context. It covers the initial phases of the formation of the Co-Lab as a community, focusing on the results obtained and the problems which emerged. The origins and foundations are described; the objectives and both the first activities undertaken and the techniques used are outlined.
One of the main problems experienced with this research was the subjective nature of observation undertaken by the author, who has a background in technology and economics. It was necessary to interact as a peer, even while participating in the collaboration process and collecting data on it: in other words, as a participant observer. As (Pickard 2010) has noted, acting as an instrument of research means being located multi-dimensionally, alternating between immersion within the situation and removing or distancing oneself from it. It is both fascinating and complex to engage in such research, which brings an increase of knowledge as well as an awareness of the limits of such a methodology.

1. Origins and foundation of Co-Lab

The context

The University of Parma was among the first universities in Italy to adopt distance education (in 1992) by following the *Progetto Nettuno* from its very inception. This project was abandoned in 2009, following to new national regulations. At the time of writing, the organisational structures which provide technological support are the *Settore Informatico e Telecomunicazioni di Ateneo* (SITA) and *Centro Didattico di Ingegneria* (CEDI). SITA provides a service that supports education and e-learning, in particular maintaining Moodle and videoconferencing software. Technical infrastructures are responsible for administration hardware, software and applications, and are concerned with offering the best minimum service in order to achieve a trouble-free level of service levels. A reorganization of the former *SITI* was accompanied by a change in the mindset and approach: systems and applications, together with the network infrastructure, have now become the core of the activities carried out by technicians.
CEDI is a centre which aims to satisfy the specific needs of the professors of engineering. It was among the first University structures and the first at the University of Parma to receive ISO9001:2000 certification for "design and management of education supporting services". The CEDI approach is not only technology driven but also service and user oriented.

The idea of a Co-Laboratory arose in 2011 in the Faculty of Humanities, amongst a group of professors and experts who were alert to innovations in information technology as well as being aware of particular learning problems. An informal group developed which became known as the *Unipr Co-Lab*. A co-laboratory is defined by William Wulf as "a center without walls, in which […] researchers can perform their research without regard to geographical location—interacting with colleagues, accessing instrumentation, sharing data and computational resource[s], and accessing information in the digital library" (Wulf, 1989, p. 7). UniPR Co-Lab was motivated by this definition, as well as by similar models which were being developed in Italian and foreign universities, with a view to creating a bridge between the technological infrastructure and the current research and teaching organization. The Co-Lab proposal was supported by the belief that knowledge creation and learning involves participation and active engagement in the practices of social communities (Wenger 2008, p.4) and was further stimulated by the duality participation-reification that mirrors the dual aspects of tacit and explicit knowledge (Hildreth & Kimble, 2002).

The ideas which inspired the UniPR Co-Lab include the visions of a global network as conceived by Bush (1945) and later Licklider & Taylor (1968) who, during the last century, appear to have

foreseen the need for networked interconnection between people and ideas. Bush's interesting idea is the Memex as an "enlarged supplement" to human memory, where an individual can store "all his books, records, and communications, and which is mechanized so that it may be consulted with exceeding speed and flexibility" (Bush 1945, pp.101–108). Licklider's vision of communication pointed out the importance of interaction between individuals to foster creativity: "When minds interact, new ideas emerge" (Licklider & Taylor 1968, pp.21–41). The group working on the Co-Lab sought to expand Engelbart's idea of "augmenting human intellect" through the use of 'prosthesis'. Engelbart held the view that extending human capabilities involved increasing the capacity of a man to approach a complex problem situation to gain comprehension to suit his particular needs, and derive solutions to the problems. Increased competence in this respect is taken to mean a mixture of the following: more-rapid and better comprehension, the possibility of gaining a useful degree of awareness in a situation that previously was too complex, speedier and better solutions, and the ability to find answers to problems that had seemed impossible to solve. Engelbart referred to a "way of life in an integrated domain", that is, what members are trying to construct every day inside the Co-Lab (Engelbart, 1962).

Progress is not only about availability of technologies; it involves a change in the role of all the actors in the academic field. The role change and modification of skills and competences does not seem to be as fast as the improvements in software applications and opportunities. As (Romiszowski 2004, pp.5-27) has observed, "the online student becomes a non-linear navigator through never-ending oceans of information — this also requires new skills and competencies." An interactive approach and supported experiences is likely to result in real understanding and in the adoption of innovations in the educational environment. The challenge is working together using available technological infrastructures and listening to each other's needs and opinions, in a search for the best possible solutions for the particular context.

Some aspects of the failure of the first generation e-learning and technology-driven education, as well as various approaches to the idea of formal online learning (Bonaiuti, 2006 have been reported in the literature. A course is more than a mere repository of study materials, even when the contents are well-designed and SCORM compliant learning objects.

From the literature, it became clear that some obstacles for the diffusion of online or blended learning can be teachers' lack of technological expertise, sustainability and shortage of resources, the quality of products, lack of awareness of the infrastructure, copyright issues and the persistence of a conservative approach. Such problems were found to be present at the University of Parma, in spite of the availability of some updated IT applications and tools.

A possible approach could be to consider the importance of the informal dimensions of learning. Learning takes place in unexpected situations and is not only to be recognized inside formal experiences. As Conner elucidated in 1997, "Informal learning describes a lifelong process whereby individuals acquire attitudes, values, skills and knowledge from daily experience and the educational influences and resources in his or her environment" (Conner, 1997-2009).
Online learning experiences often try to merely create communities inside a restricted area on the learning platform, resulting in closed environments more than collaborative communities. It is only by expanding them out of those boundaries, gaining experience together and adding real life projects and challenges that a real community of practice can survive through different periods and situations.

The objectives of the Co-Lab

Digital Co-Lab was founded on three basic principles: collaboration, sharing (of techniques and

methods, environments, software and contents), and creativity (Tammaro et al., 2011) The purpose is to use e-collaboration to discover and exploit the opportunities offered by IT tools, including the Internet, in order to achieve goals together with others (Pillan & Sancassani, 2003).
The Co-Lab experience is not only about technology, but includes working with people using appropriate tools for each context, and thereby creating a collaborative community of students, technicians and professors. This is not common within the academic environment; the challenge is to understand if such an approach leads to better educational and research results for all the actors involved. It is hoped that sharing the Co-Lab experience at the University of Parma – including both its successes and difficulties – will lead to further development in this area. To this end, the Co-Lab projects also include digital publishing for dissemination of experiences.

UniPR Co-Lab members develop research activities in order to:

- create competences for online learning;
- develop methodologies and technology-supported learning contexts, by adhering to local and international projects, and acting in a collaborative environment;
- create a research system, through multichannel and multimedia platforms, and an organizational infrastructure consisting of researchers, tools, knowledge and processes, geared towards fostering digital publishing and the dissemination of the results of research

In this context some specific objectives are:

- to carry out interactive and collaborative laboratories to answer to real needs of students and professors;
- to foster laboratories concerning digital publishing, digital libraries and e-books;
- to monitor and develop multidisciplinary learning practices;
- to carry out research on social media, open educational resources, webinars and mobile learning;

2. The Co-Lab as a Community of Practice

The concept of a Community of Practice was first introduced in 1991 (Wenger & Lave, 1991) but was subsequently further defined, taking into consideration characteristics, benefits and drawbacks of CoPs for knowledge sharing. Being informally bound by the necessity to solve similar problems is one of the features that sustains CoPs (Kimble et al., 2004), together with their engaging in common activities (Kimble & Hildreth, 2004). CoPs are not only teams or groups (Brown & Gray, 1995), and explaining what Co-lab members do not want to be enables the essence of their identity to be identified. For example, the Co-Lab is not a team focusing on ONE project. Each actor can participate in several projects, depending on the available time, as well as on particular interests, skills and competences. As mentioned above, it is also not just a 'group': rather it is a living entity which is constantly being modified through its lived experiences and responses to needs, activities and problems. As Wenger (2008) emphasises, three characteristics are crucial for a community to be considered as a CoP:

1. The **domain**. Co-Lab members are professors, researchers, students and technicians, and share an interest in gaining better results in education and research through an informed and reasoned use of Information Technologies and tools.
2. The **community**. Co-Lab members actually "engage in joint activities and discussions, help each other, and share information"; in this way they interact and learn together from each other how to face different situations. The sense of belonging is high, even if it is a group of people with different backgrounds, roles and being part of different institutional and organizational structures.
3. The **practice**. Co-Lab is a laboratory created to foster collaboration, in order to experiment

with the qualitative extension that technological tools allow, and to increase student learning and the quality of research. Practice is not only spread in formal meetings but by the number of experiences that occur daily, developing out of conversations, storytelling, and discussing issues and problems. It is clear that all participants need to be on good terms if they are to share this much information. Indeed it is essential that they adopt the same approach to knowledge sharing.

Beginning with certain identified activities, the situation was analysed and examples listed, to ensure that all activities could be facilitated within the Co-Lab. Table 1 gives a summary of examples. Such activities are also recognizable in the further description of specific experiences.

Activities	Examples
Problem solving	"Snow is creating big problems, and tomorrow we cannot meet. What if we met and discussed the matter online?"
Requests for information	"How could I have students work together and comment online on a literature text? Which could be the best solution?"
Seeking experience	"Have you ever tried to work with students in groups on text analysis? Which were the pros and cons?"
Reusing assets	"I have prepared some short tutorials for a project about creating subtitles with two open source tools; you could use them for your students' homework. They could follow tutorials to create examples. I can send everything to you and then we can modify it and design this new experience"
Coordination and synergy	"Can we together buy a recording kit and use it when we need it?" "We are involving students in lecture and seminar recording, and are creating a team to record; we could help you with your recordings and you could give us your free rooms to organize seminars".
Discussing developments	"What do you think of this learning system testing? Can it be useful for your needs?" "What could be the future of our video platform in your opinion?"
Documentation	"We have faced this problem five times now. Let's write it down once and for all."
Visits	"Can we come and visit your rooms where you implemented a static Eya system to verify how we could do that at our University?"
Mapping knowledge and identifying gaps	"Can we write an article together showing different approaches to the problems we met with while designing this course using technologies?" "We wrote a diary of our experience, so that you do not repeat our mistakes, for the conversion of videos to be uploaded upon our video platform"

Table 1: Examples of application to UniPR Co-Lab of activities identified by Wenger as developing practice inside a community

As a social construct, a CoP is different from a traditional community, primarily because it is defined simultaneously by its membership and by the practice in which that membership engages (Wenger & Lave, 1991). The idea of the community as an extension of identity resonates with the idea of the extension of the individual's capacity. In this way, the diversely composed scientific community, and the collaboratory itself becomes a "prosthesis" for thinking and learning. This approach enhances the individual participant's capacities and may also create synergies through

sharing and collaborating, and thus overcoming, in some way, the problems incurred during times of financial stress.

Dissemination of UniPR Co-Lab team began with laboratories and events to involve students, professors, teachers, and researchers, as well as to create a student team to work on projects beyond the classroom, and the activities included providing support to two international Master's degrees.

3. DILL and METAV Master's degrees

Two international degrees – the *Master Europeo in Traduzione Audiovisiva* (METAV) and the *Master's in Digital Library Learning* (DILL) are offered by the Humanities Faculty which involve distance education using mediating technologies.
DILL is a two-year course for international information professionals, which provides them with the skills and competencies required to navigate the rapidly evolving world of digital libraries. Initially an Erasmus Mundus project, it is offered through cooperation between Oslo and Akershus College of Applied Sciences (Norway), Tallin University (Estonia) and the University of Parma (Italy). DILL admits both European and non-European students. A number of different selection criteria are used, including an excellent academic background, a statement of purpose, relevant experience and professional training. The first and second semesters are spent in Oslo and Tallinn, where students are given a basic introduction to research methods, digital documents, information, knowledge and human resource management in the context of libraries. In Parma the students follow modules on digital libraries about users, usage and access. The third semester also contains a work placement. Finally, in the last semester, students write their Master's thesis. ("DILL," n.d.).
The Masters degree in audiovisual production is offered entirely online jointly with the Universidad Autonoma de Barcelona (UAB).

In order to illustrate some CoLab activities, it is useful to examine the support given to the DILL programme, in particular.
The Co-Lab activities included organising internships for the students, fostering reflection on competences and learning needs by using e-portfolios and video resumes, and assisting students in making a final choice with regards to their dissertation topic. These activities include providing advice and support in real time. The focus of the CoLab is on collaboration and sharing amongst the students. Observation is carried out in the system both through tutor presence and the use of different methods of communication (*inter alia*, Facebook groups and forum activities inside the Learning Management System). The closed Facebook group has been useful for participants to stay in touch with new calls for papers and events, as well as to create a pleasant environment in which to share group pictures, provide information about educational events, details and reminders. The practical usefulness of the tool was perceived by different classes.

Suggestions were made for a creative use of the learning activity tools for LIS (Library Information Science) students inside the Virtual Learning Environment (VLE). One example was a creative development of user roles within the Learning Management System (LMS) to create scenarios and an ideal environment for interaction. Even though these ideas were initially warmly welcomed, some have not yet been put into practice, as the group of professors could not come to any agreement, particularly as some lacked the technical knowledge to fully exploit the LMS' functionalities. In addition, because the classes are given in face-to-face mode with concomitant immediate interactivity, there did not appear to be much reason to substitute these interactions by using virtual tools. However, when the students were no longer in class, such as during the internship period or while they were writing their theses, the VLE tools seemed to be appreciated more.

4. Co-Lab Methodology

The Co-Lab activities as shown in Fig. 1 arose as a result of using an experimental methodology, in which the starting point is the problem to be solved, or the activity to be fostered through appropriate use of available technical tools. Members agreed on precise objectives to be reached in order to carry out step-by-step monitoring during the conduct of the experience. For each activity a daily journal is kept; at the end of each activity there is a collective reflection on all aspects to be improved.

However, because of the very nature of the CoLab as a centre for collaborative knowledge creation, sharing and learning, other participants besides the researcher herself were also invited to record data, which was in turn shared amongst the whole group. Thus a common knowledge base was developed which was organic in nature, growing and modifying over time as learning and insights grew. This is in accordance with Wenger's identification of activities within a community, which encourage practice and the sharing of such experience (Wenger, 2006). The Co-Lab experience is a continuous process of renegotiation of identity and meaning, that passes through conversations, collaborative practical activities, imitation, intuitive understanding, discoveries, mistakes, discussions, problems, theory and practice. It is what Bonaiuti (2006) describes as extended cognitive context, where learning becomes a distributed practice and springs up interactively and among individuals in many different real situations.

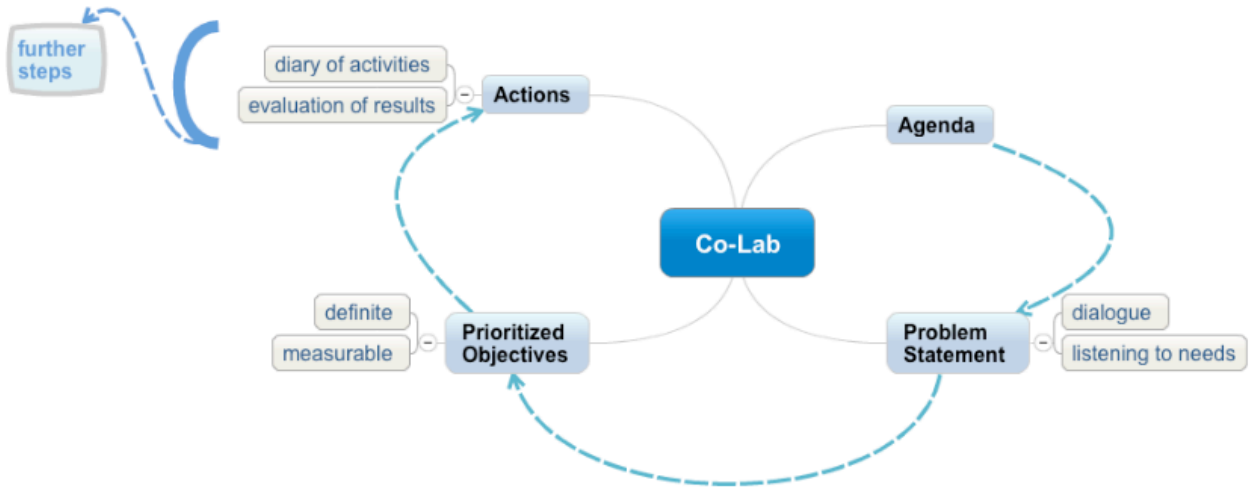

Figure 1: Co-Lab Methodology (adapted from Tammaro et al. 2012)

The engagement of people's identity in their activities was fostered, as learning happens at each step of the process and for all actors. The technologists interviewed the teachers about their needs and their course objectives, in order to give the correct advice for each specific context, and in this way, the technologists were able to discover the important aspects of the educational process. On the other hand, professors learnt how to use the tools from the technologists and they decided together on selecting the best one for a specific educational experience. Technologists and professors thus worked together to produce the best possible learning results, and collaboratively documented their experiences. Sometimes, when technicians proposed tools, they realised that it might be advisable to change direction and choose something else instead, as the first choice may not have been the best solution within a particular context.
Figure 2 shows the interactions and connections between actors, projects and structures within the Co-Lab Community, as opposed to a vertical and hierarchical structure (Wenger, 2011).

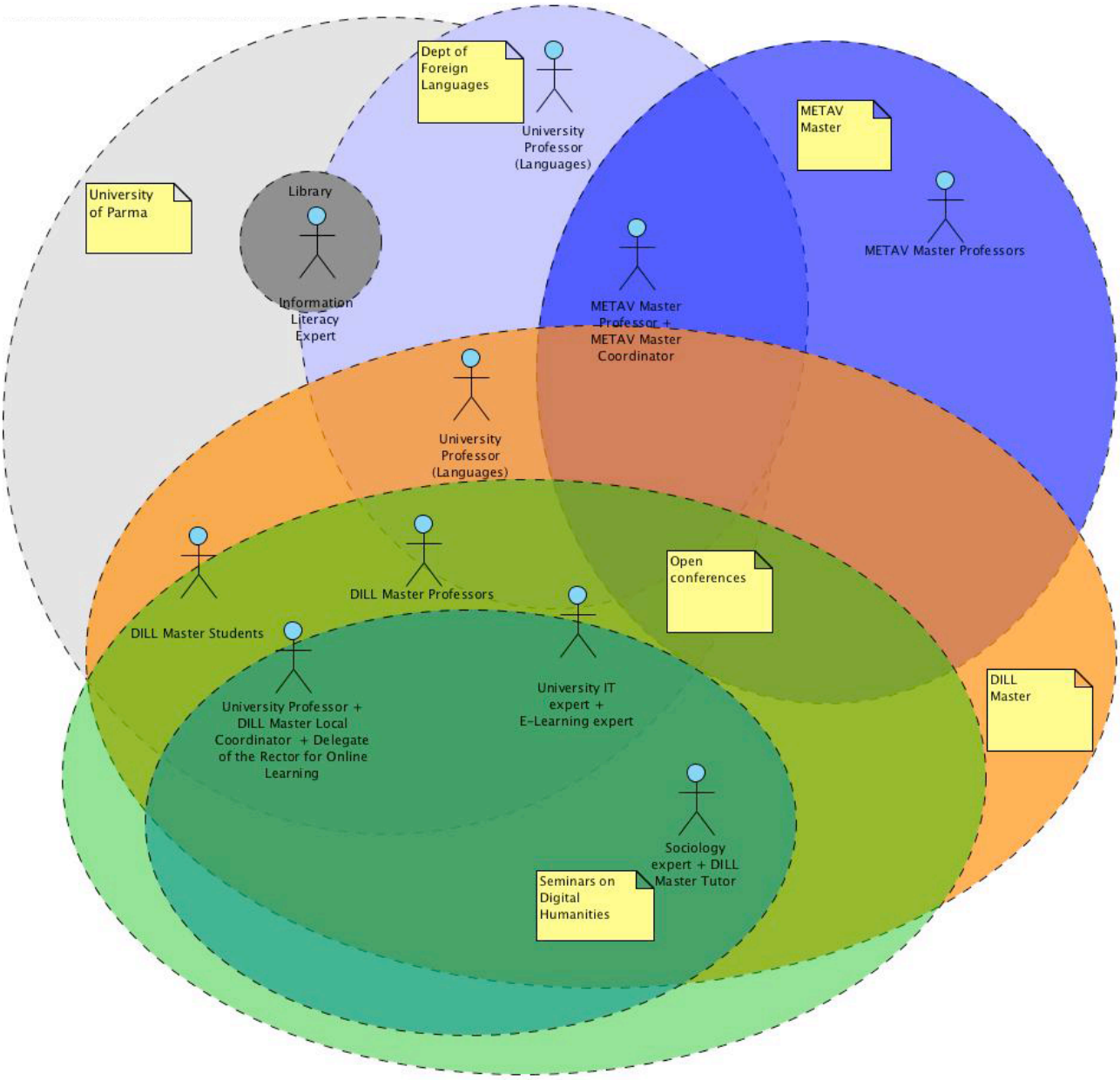

Figure 2: Co-Lab Community interactions: actors, projects and structures

Horizontal accountability supports individual identity, connections between members and peer-to-peer contacts, as well facilitating learning, creating personal meaning, encouraging engagement and creativity. The Co-Lab is also trying to achieve its objectives with less effort due to the re-use of content and competencies, and repurposing these on an as-needed basis.

Data collection

Data was collected in various ways for this study, mainly through observation. The results of observations were logged in shared documents, such as diaries created by means of wikis or blogs. Qualitative interviews were conducted with the professors involved in the first delivery of METAV programme. They were asked to report on the pros and cons of their experiences, to comment on the course structure and suggest improvements. It was interesting that most professors asked for additional tools to interact with students, and many of them asked for applications that were already available on the platform, suggesting that they were not aware of all the possibilities already offered, as of existing videoconferencing services at University. It is probably useful to adopt a

slightly different point of view concerning service level and approach in the future.
All of those involved who were interviewed, emphasised the importance and effectiveness of the social format for courses, and the possibility for active participation in forum activities. This indicates that a social approach to courses may involve students more, and it could be useful to consider such an approach for DILL Master's degree, as well. The majority of professors asked for a more flexible version of the platform, with regards to file management and tools to increase interactivity and co-operation.

5. Results

The experience of UniPR Co-Lab is an example of bottom-up organizational change that fosters knowledge sharing. The narration of the activities undertaken by members has shown that it was possible for an informal and diverse group to collaborate both face-to-face and online, and describes the observations, showing individual, community and organizational community benefits and some drawbacks. Learning about tools, methods and procedures was fostered through practice, and a common context was shared. Some community costs were covered by resources that were already available for the projects. An evaluation of the community costs might be useful, including the opportunity costs of people's engagement in community activities, in order to better explore organizational benefits and compare costs to the saving of time derived from knowledge sharing and solving problems together (Millen et. al, 2002).

A great deal of data emanated from this research study, and several themes emerged, most of which have led to new developments and applications in the CoLab; for example, the opinions gathered from the interviews were convincing and led to the installation of an alternative version of the LMS platform for Co-Lab team, in order to gain improved flexibility when it came to testing, together with students, the modules and plug-ins that might meet specific needs.

Use of videoconferencing technologies

There has been a significant increase in the use of the videoconferencing tools to support learning, in order to allow students to participate further, to avoid delays in decisions due to difficulties in meeting in the same place at the same time, and to support events with asynchronously recorded interviews to important speakers all over the world. This tool is being used for virtual meetings during the DILL Thesis semester in Parma. Meetings are organized where students can hold their presentations and professors participate by giving suggestions for improvement. An online academic writing tutorial has been organized and recorded through the platform.

An increased use of videoconferencing tools was also suggested for synchronous meetings, thus adopting a different approach to this technological solution that led to a paradigmatic change. Some virtual rooms were created and carefully "furnished" differently on each occasion according to the specific needs, by using different layouts. Not only written instructions are given, thus leaving the actors alone, but people are instructed and trained through practice. Instead of wasting the technician's time, this process is viewed as an investment, as the more the professors and researchers consider the system to be important and simple to use, the more it will be employed, thus creating further innovative opportunities. The UniPR Co-Lab is constantly harvesting and experimenting with new use models and situations. It is about communication being more than just sender and receiver, but also about how change can be brought about through communication (Licklider & Taylor, 1968).

Cross-disciplinarity

Data from the learning platform gathered during July 2011 showed that professors from the Faculty of Humanities, together with those from the Faculty of Engineering, were the most frequent users of

the formal learning environments at the University of Parma (35,7% of the total online courses). This is significant as it showed connections between the technological and humanities areas of the University, of which previously the University had probably not been aware.

In order to further multidisciplinary activities at the University, the CoLab organized a series of Seminars on Digital Humanities, which have become a part of the curriculum of Digital Publishing. Further collaboration was also stimulated by proposing a digital edition of seminars that involved the creation of an e-book, "*Umanisti e risorse Digitali*", that was the first of what is hoped to be a series of future cross-disciplinary digital publications. All seminars were recorded and are available to students and the public.

Connections between different views of library and information science

It was useful to identify similarities and differences between approaches to information science from different professionals and researchers inside their fields of activities and studies. Part of this process of creating a crossroads between different environments was also the topic of the joint Seminar "*Il futuro del libro*" which was organized together with the important and ancient library *Biblioteca Palatina* as well as some secondary schools in Parma.

Online education laboratory with the 'Science Dissemination Unit'

A laboratory was initiated for the creation of online educational skills and the development of specific methodologies and contexts, particularly with regard to the use of multimedia contents. In addition, a new co-operative venture has now been embarked upon, in collaboration with the Science Dissemination Unit of the *International Centre for Theoretical Physics*. Here, open source software *openEyA* (Canessa *et al*. 2012) is being used for the recording of lectures and events. Such a laboratory is meant to create content as well as to learn while actively constructing digital libraries with recorded contents. Tutorials were organized for digital librarians, teachers and students, in order to spread news of this and receive feedback. The sessions were practical and participants could join in and test the solutions immediately. It became clear from conversations that students often record using their personal audio devices, and once given permission they showed willingness to learn how to use such tools; teams of students worked in turn with *openEyA*, recording lectures and seminars, as well as interviews with the professors. Students in the DILL Master's and in the Digital Publishing course applied for further practical training on *openEyA*, so that they were familiar with digital publishing, sharing and co-operative tools that they would probably use in the future during their working lives. They worked in teams on real-life projects to identify problems and foster solutions.
The involvement of students using tools and devices gave further feedback to the developers about the pros, cons and needs and on further improving the software functionalities.

The next step will involve research on the opportunity to create content to be used on mobile devices, to explore the opportunities offered by mobile learning and in order to understand whether students and teachers are ready for mobile learning (Corbeil & Valdes-Corbeil, 2007).

Project-driven learning

Another important Co-Lab activity is the continuous training support: MIXMeS laboratory. Considering the 'unconference' model, where meetings are driven by participants, a proposal was made for a project-driven learning event, a learning-by-doing experience, where volunteer teachers and researches could join in and decide which projects they wanted to work on.
Decisions were taken to adopt a plurality of methods and tools; in order to choose the best ones professors would test and verify their ability to help satisfy learning objectives. An online brainstorming session was held to identify interesting topics and ideas. The mixMeS laboratory was

to begin in January 2012. The pilot project was to involve participants from the Department of Foreign Languages (Valla & Monaco, 2012). However, the message was probably not clear enough, and the initiative was initially not taken up as was hoped. The possible reasons for this were because it was probably confused with training, even though this was unintentional, and it was not perceived as a way of meeting specific needs. Educators often have no time to learn, but may have problems of practice (Hammond & Ball, 1999).
Later, some professors started working together with instructional designers on innovative educational and research projects, acquiring competences and skills concerning the correct choice for the specific context and needs. The participants are now using and testing web conference and chat tools for interaction, even during the collaborative writing of documents. They are using social and e-collaboration environments, such as video and image sharing platforms (YouTube, YOUnipr (Valla & Comelli, 2009), Moodle, Vimeo, Flickr), online scheduling tools (Doodle, Google Calendar). This reinforced the belief that Co-Lab was not only a team and not only about projects, rather it was about practice among professionals.

Creation of learning events and selection of technologies

Initially, through observation and discussions with both DILL students and professors, it became clear that it might be interesting to prepare activities in advance of the semester, using this opportunity to share ideas concerning the virtual environment. In keeping with this notion, it was considered useful to offer tutorials to the professors before the semester started, so that they could practice on some of the tools. Otherwise, it was felt, there was not enough time. The low use of the forums offered by the Co-Lab during the Parma semester may also have been due to the lack of tutoring support of the online activities. In future, this might be changed by training the tutors and it could be assessed in time by a qualitative analysis. The creation of the context and environment collaboratively with professors and students could achieve better results, as the different points of view and multicultural experience of DILL students might provide a richer environment for interaction than that provided simply by instructional design and appropriate technologies.

Social learning

The students are being introduced to Social Bookmarking and Social Reading to pursue social learning; these concepts have been previously discussed during focus groups held with DILL Master's students and University librarians, in order to investigate how librarians might help foster the usefulness of such laboratories. Some tools are being tested in order to meet specific learning objectives, in particular for digital publishing and language learning courses.

Self-evaluation

Co-Lab is also investigating the possible use of the Learning Platform for students' self-evaluation through an automatic system before the oral examination. This could help the students to concentrate on topics where they have major weaknesses, so that professors can further work on the understanding of such topics.

Conclusions and future visions

The methodology chosen, beginning with problems in order to reach defined objectives that can be evaluated, combined with the daily effort to ensure that the technical system can satisfy individual and subjective needs, was not the easiest to implement, but nevertheless proved to be one that could fully facilitate technologies in real-life scenarios, and extending human capacity to improve the quality of learning.

This study has made clear that technology is the servant of needs and not vice versa, and that if requirements and wishes are not investigated, and the tools subsequently do not meet needs, then they are likely to remain unused, even though they are available. In spite of this, the technological infrastructure, and the approach to innovation of the existing structures may influence the opportunity to research the solutions that best satisfy needs.

Organizational culture, including practices and core elements, is different in each context, and in different Departments of the same University; it might be difficult to apply the same approach to various situations (Schein, 2006); (Morgan, 1977). Nevertheless, academic institutions often present a hierarchical structure that may create difficulties and delays when innovation and learning are concerned; the present times require an interdisciplinary and collaborative approach to act in a dynamic environment in spite of the limited availability of resources.

The CoLab was conceptualised as getting a group of like-minded people together. The activities undertaken using the CoLab show various forms of mutual peer learning based upon the sharing of experiences, knowledge and best practices, typical of professional communities of practice (Trentin, 2004, p. 23), irrespective of hierarchies and roles. This only became possible when participants shared the same approach and understanding of the collaboratory. Cases were observed where newcomers misunderstood knowledge sharing with platforms for sharing. In order to avoid this, communication and the sharing of experiences are necessary on a regular basis.

The Co-Lab, as a community, has crossed boundaries and overcome the limitations that often separate the technological and educational areas, and it uses technologies as learning assets to shorten distances. For example, the unusual conversation among scholars from the Information Engineering and Humanities areas has led to innovative approaches to research and learning. The participation of international students and scholars of the DILL Master's Degrees was essential for the community to broaden its perspectives and collect the views of new (digital) librarians regarding the information and knowledge world surrounding academies.

CoPs have been viewed as naturally forming, informal social phenomena (Easterby-Smith & Lyles, 2011). Co-Lab was born spontaneously, and is now being recognized as a research centre. On the one hand, this is rewarding, as it is an institutional way of recognizing the value of such an experience. On the other hand, regulations concerning centres are probably rigid and do not foresee CoPs and collaboratories as forms of organizing. The challenge is to face a situation where the new organizational form may formally re-establish specific hierarchies and aprioristic inclusions/exclusions of certain professional roles.

Further efforts are worthwhile, so that vision and shared principles may be continuously transmitted through confrontation and practice, as well as the dissemination of the results of the experiences, in order for the community to stay alive and attract new competences and resources both from inside and outside the University.

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