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# A PLATFORM TO SUPPORT A VIRTUAL COMMUNITY OF TUTORS IN EXPERIENCE CAPITALIZING

Garrot Élise, George Sébastien, Prévôt Patrick  
*ICTT Laboratory, INSA-Lyon, F-69621, France*  
*{elise.garrot; sebastien.george; patrick.prevot}@insa-lyon.fr*

## ABSTRACT

Nowadays, Information and Communication Technologies change the way students learn. Many researches are centered on the developing of new forms of pedagogy and software for student learning. But ICT also involve changes in teachers roles, which are not yet well defined in particular for on-line tutors. In this article, we develop new ways for tutors to define themselves their “professional identity”, their functions and “good practices”. By providing a platform to develop communities of practice of tutors, we aim at giving them the possibility to share knowledge, experiences and to refer to them in their day-to-day practice. We present a prototype of tutors interface to record and retrieve experiences stored as knowledge in a database.

## KEYWORDS

Virtual Communities of Practice, On-line Tutor, Knowledge Management System, Communication and Information Technologies

## 1. INTRODUCTION

Nowadays, virtual communities concern several areas. We can talk about communities of practice in companies to develop innovation or communities of interests with the development of forums, blogs and wikis on Internet. Everybody is concerned with this new way of social communication.

In education, Information and Communication Technologies (ICT) involve new learning techniques, which are used by companies and universities with on-line courses and training. But it involves a new definition and new roles for the teacher in distance learning, and particularly for the tutor. It is now the time to study the way to use ICT to support tutors in the tasks that one assigns to them.

In the first section of this article, we study the changes involved by ICT in education and the problems we want to solve. In the second section, we present communities of practice (CoPs) as a means to help tutors. Then, we present the design of a knowledge management system which can be used by this community of tutors to support them in their work and to capitalize on their experiences. We also show a prototype of tutor interface to store and retrieve useful experiences. Finally, we conclude with future directions and all the possibilities implied by the definition of tutor roles and by the platform we develop.

## 2. RESEARCH ISSUES

The more and more important roles played by Internet and especially by ICT have changed the way we learn. Distance learning moved from a mail to an on-line mode. We emphasize benefits of this new form of education for students, like course individualization and flexibility in terms of space and time.

Computer mediated education involves new roles for teachers. In a traditional classroom, the teacher is the designer of his/her course and often transmits course contents to students. There is a direct relation between them and students. Teachers can see if the class is in trouble. Sometimes, if the size of the group

allows it, learners can ask questions in real time and everyone can hear the answer. There is a delineated time for learning. But, at a distance, the teacher's jobs are divided into several distinct roles. Time and space marks are lost (Garrot *et al.*, 2006).

Now there are two people: the instructional designer and the tutor. Contents are created by the instructional designer who is an expert on teaching area. Contents are then delivered to students often without any relation with the instructional designer. The tutor role is divided into several functions which vary according to distance courses and are generally classified into four parts: pedagogical, organisational, relational and technical. Tutoring usually consists in interacting with learners to assist them in building knowledge and competencies and to assess them.

Now, research tends to develop more and more educational software and on-line courses to diversify learning activities for students, like project based learning or case studies. It is also centred on the characterization and the standardization of learning activities in order to assist instructional designers in the designing of scenarios.

But according to Casey and Greller (2005), the development and technical community is realizing that "*there is much more to teaching than delivering the 'right' content and organising the 'right' student activities*". For the course to be effective, Mc Pherson and Nunes (2004) insist on the importance of the role both of the tutor and the instructional designer: "*the focus is frequently placed on design and developing information and communication technology (ICT) based environments and insufficient attention is given to the delivery process. These efforts have little chance of succeeding without a tutoring team that has appropriate online tutoring skills necessary to explore and maximize the designed environments.*"

Currently, tutors have scripted courses that they try to adapt to their students without help. Tutors do their work as best they can because:

- The instrumentation of tutor activity in distance learning environments is still little developed (Dufresne *et al.*, 2003).
- They have no means to monitor the change of their activities. It is necessary to make them aware that traditional courses cannot become "on-line learning" by modification or adaptation. It requires a fundamental restructuring.

Concerning the first point, an important problem is that there are no traces of their work (decisions taken, events produced, scenario configuration or personalization, quality of the knowledge building process). Therefore there is no possibility of sharing practices and reusing them in other contexts.

As a result, tutors do not really know what they have to do and what the best way to do it is. Tutoring is not yet considered as a separate profession and tutors' work is not well defined. In literature, distance tutors are named differently, according to the functions that one assigns to them: moderator, facilitator, online tutor, online moderator, e-moderator, coach, distance education tutor, e-tutor... A tutor is usually a single person who does not know how to situate him/herself between students and instructional designers.

So, not only do ICT change the way students learn, but also the way teachers work. We study how ICT can contribute to the recognition and definition of a specific role of tutor. Today it is advisable in education to ask the question of how ICT, having modified the teacher role, can now contribute to define it and help "tutors".

So, our research purpose is to bring a solution to solve the problems for tutors defined in this section, which are:

- Lack of professional identity.
- Lack of help in their day-to-day practice.
- Lack of practice sharing.

### 3. TUTORS IN A VIRTUAL COMMUNITY OF PRACTICE

Casey and Greller (2005) assert that "*good teaching [...] is reflective and reflexive about the experience of teaching and incorporates lessons learnt from the experience of teaching into teaching practice*". Tutors must examine their own work. They also have to confront their ideas in order to determine "good practices", and so have the possibility to refer to these. According to a socio-constructivist approach of learning, collaboration between tutors can help each one to build new competencies and reinforce existing ones. It refers to the notion of "proximal zone of development" defined in (Vygotsky, 1986).

That is why we suggest that tutors develop their competencies and define their work and good practices in the context of a community of practice. We now describe how this approach can contribute in solving all the problems previously defined.

### 3.1 COMMUNITIES OF PRACTICE

According to Wenger *et al.* (2002), communities of practice (CoPs) are “*groups of people who share a concern, a set of problems, or a passion about a topic, and who **deepen their knowledge and expertise** in this area by interacting on an ongoing basis.*” They operate as “social learning systems” (Snyder *et al.*, 2004) where practitioners connect to solve problems, share ideas, set standards, build tools, and develop relationships with peers. Organizations and researchers use a variety of terms which refer to CoPs: knowledge communities, knowledge networks, learning networks... In order to situate a CoP in reference to all these terms, Snyder *et al.* (2004) give a definition: “*A community of practice is a particular type of network that features peer-to-peer collaborative activities to **build member skills***”.

Other important aspects of CoPs are pointed out by Scarbough and Swan (1999): “*Socially, CoP are the fabrics of knowing as members of CoP **acquire communal identity** around a shared passion, relationships, **roles and ways of intermingling common knowledge, practices and approaches***”. This definition highlights the social aspect of CoPs. Members of a CoP, by interacting around a same subject, define common practices, and create identity which is common to all the members.

A virtual community of practice is a specific kind of CoP, resulting from computer mediation. According to Koh and Kim (2004), a virtual community is “*a group of people with common interests or goals, **interacting** for knowledge (or information) sharing predominantly **in cyberspace***.” Relationships in virtual CoPs are now software mediated (e.g. forum, blog or wiki) generally classified by topic of interest. Fernback and Thompson (1995) pointed out the need for a virtual CoP to have “*a **specified boundary or place** (e.g., a conference or chat line) that is symbolically delineated by topic of interest.*”

In the context of our study, we take up these main characteristics of virtual CoPs:

- Members share an interest, roles, a concern, a set of problems or a passion.
- They aim at building members skills and deepening their knowledge and expertise.
- Members acquire a common identity.
- They need a specified boundary or place.
- Practitioners define common knowledge, practices and approaches.

By putting these characteristics together, we notice that creating a CoP for tutors could be a solution to the problems highlighted in the previous section. CoPs give the possibility for tutors from different backgrounds to define and acquire a professional identity, to share and develop their knowledge, competencies, expertise and to define “good practices” to apply in their work. But we now have to define the organization for a specific CoP of tutor, and the tools to support their interactions.

### 3.2 TUTORS IN COMMUNITIES

There are tutors in many countries in the world and they all have their own practices and their own background. Tutors usually have another job and do tutoring as an “extra”, along with their job. Some of them are teachers in university, researchers, and company employees... So they have different competencies and expertise to share with others and to acquire by participating in a CoP.

According to Mc Pherson and Nunes (2004), for successful online learning, tutors must have subject matter expertise, technical skills, and also be educationalists with pedagogical, information and communication skills that are necessary to manage and facilitate online learning. But, due to their various backgrounds and the lack of training, only a few tutors have all these requirements. That is why it is important to favor the development of CoPs in which tutors will improve their expertise and competencies. Since “communities are emergent” (Brown and Duguid, 1991), we can not “create” CoPs but we could provide the infrastructure in which they will emerge.

We base our work on interviews of tutors, in order to know their needs and opinion. Regarding, on the one hand, the tutor role and, on the other hand, characteristics of CoPs, we can distinguish three types of CoP of tutors (Fig. 1).

### 3.2.1 Tutors who monitor the same type of activities:

As we said previously, there are more and more various activities offered to learners in distance learning: project-based learning, case study... These activities can be divided into several distinct phases: for example individual or collaborative phases, distance or face-to-face phases... So, tutor functions vary according to these different types of phases. Communities can be created for tutors who supervise the same type of activity, in order to improve their practice and to share their experiences.

### 3.2.2 Tutors who have the same function in a course:

According to the on-line courses, the training, the type of activities or the university, different functions are assigned to tutors. We sum up these possible functions, detailed in (Garrot, 2006). The tutor can be:

- An assessor: the tutor assesses the learning group's productions and activities, and the competencies and knowledge acquired by a learner.
- An intellectual catalyst: to incite learners to have individual reflection, to express themselves publicly and to develop their ideas (Denis *et al.*, 2004).
- A moderator of interactions: the tutor develops and regulates interactions (Dillenbourg, 1999) and sets up the group dynamics.
- A psychological and emotional support: a human mediator to motivate, encourage, stimulate learners (Lentell, 2003) and create a friendly learning environment.
- A facilitator of learning: for a given learning situation, tutor can provide documents or advise adapted resources to guide learners and give them feedback on the assessment.
- A technical support: the tutor helps learners to get acquainted with tools and provides technical support in case of trouble.
- A pedagogical architect: tutor has scope to adapt the learning situations created by the instructional designer to learners' needs and characteristics.

### 3.2.3 Tutors who use the same subject matter:

In order to develop their knowledge and competencies in their subject matter, it is important to provide tutors with topics. Furthermore, the tutor's role can vary according to the subject matter concerned, e.g. computer science, humanities or corporate knowledge management.

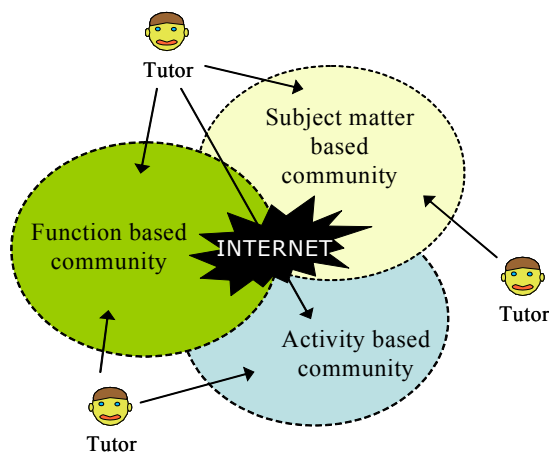


Figure1. CoPs of tutors as a global community

So, we can see that CoPs of tutors can be defined by a university or a company, they should be defined by common interests and common practices: “CoPs are important as they weave the organization around competencies without reverting to functional structures” (Pan and Leidner, 2003). A tutor can only participate in a specific community or in two or three types of CoP. The advantage of defining several communities around shared practices is to create more knowledge and develop more interactions than in a global community (Pan and Leidner, 2003). Furthermore, within an organization perceived as a set of

communities, not simply of individuals, separate community perspectives can be amplified by interchanges among communities (Brown and Duguid, 1991).

## 4. A KNOWLEDGE MANAGEMENT SYSTEM

According to a socio-technical approach, Koh and Kim (2004) distinguish two important points in order to develop CoPs: usability and sociability. Concerning sociability, William and Cothrel (2000) suggested three virtual community managing strategies: member development, community asset management and community relationship management. More specifically, in order to run a virtual community intelligently, a clear vision, opinion leaders, off-line activities, rules/roles, and useful contents based on expertise are required. In addition to these common social characteristics of successful communities, Whitaker and Parker (2000) highlight the importance of technology factors such as consistent and compatible software, which are very important in the context of a virtual community.

In (Pan and Leidner, 2003), the authors look at the use of information technology to link communities in order to create global knowledge sharing. They draw conclusions of the implementation of a Knowledge Management System (KMS) in a world company. They assure that it is important to create common knowledge CoP as opposed to a single global community or multi-region forum arrangement. They emphasize the need to provide multiple channels/forums for diverse knowledge sharing needs and preferences.

Von Krogh (1999) distinguishes three stages of KM: capturing knowledge, sharing and transferring knowledge, generating new knowledge. To overcome these stages, we implement a system to facilitate the capturing of tutors knowledge (their experiences, useful documents and links, references...). The knowledge sharing and generating will be the result of the activity of CoPs. Since *“the structural process that is associated with community is communication”* (Fernback and Thompson, 1995), we have to provide to CoPs with the suited software to develop interactions.

So, in this section, we present our platform functionalities and tools to support CoPs interactions and knowledge sharing. We also define the organization of CoPs: leaders, rules and roles.

### 4.1 Functionalities of the system and network architecture

In order to choose the tools to support the CoPs of tutors, we first define functionalities that tutors need:

- To interact with other tutors about experiences and to determine “good practices” (the level of interaction defines the level of participation in the community).
- To refer to an expert tutor in a field of competencies (technical, subject matter...).
- To relate and store an experience.
- To record documents, useful links and other resources.
- To retrieve contextual experiences stored as knowledge.

To support these functionalities, we choose to develop a platform with a database and two communication tools: email and forum. As illustrated in Fig. 2, there are different information and communication flows:

- From a tutor to a community (by forum).
- From a tutor to an expert tutor (by email).
- From the database to a tutor interface.
- From a tutor interface to the database.

Each tutor can access an interface (we show a prototype of this interface in the next section) to connect to the database, in order to store or search experiences. When referring to an experience, tutors can contact a tutor or access a forum. In order to support each community, a forum is associated to each type of community. For example, we propose:

- a forum for tutors who monitor collaborative activities,
- a forum about the function of interaction moderator,
- or a forum about sciences courses.

Threads of forum can be stored in the database. To summarize, the database contains various types of data:

- Information about tutors (users of the platform).
- Information about activities defined by parameters.
- Experiences (text files), entered by a tutor directly in the base or thread of forum.
- Good practices (text files) which are threads of forum or a document written by the community.
- Documents stored by a tutor (useful resources).

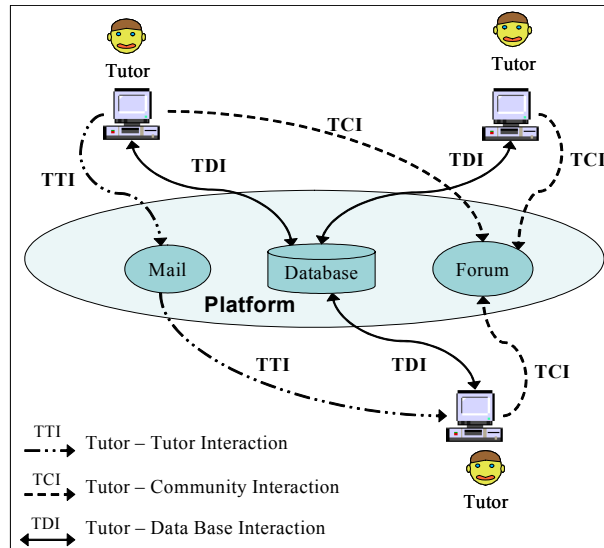


Figure 2. Mediated interactions through the platform supporting CoP of tutors

## 4.2 Tutor interface for knowledge searching and retrieval

With our system, we want tutors to record experiences. An experience could be what they set up in their course and whether it works or not. For example, a tutor can adapt difficulties to a specific learner and improve his/her learning. It must be an interesting testimony for the other tutors. But, to be effective, this action must be performed short, because tutors do not have enough time for this. That is why we have to develop a simple interface which is well defined and easy to use.

We choose to create a matrix in which tutors can store experiences according to a function or a specific phase of the course (Fig. 3). The first line of the matrix corresponds to the several phases of a course, which are parameterized activities.

When accessing the matrix for the first time, the tutor determines parameters (illustrated in a cell) of each activity in the course:

- Individual or collective activity.
- Distance or face-to-face activity.
- Synchronous or asynchronous activity.

Fig. 3 illustrates a case study which has four activities. The tutor can click on different cells to store or search an experience. For example:

- ① is a cell in the intersection of a column and a line. The tutor accesses experiences which correspond to the function of motivational support and the second phase of the case study (cause searching).
- ② is a cell in first column. The tutor accesses all experiences linked to the motivational support function.
- ③ is a cell in first line. The tutor accesses all experiences related to the second phase.

The number in each cell indicates the number of experiences which correspond to a specific function and a type of activity. Darker is the color of the box, more there are stored experiences. So, with this matrix,

tutors can store and access the experiences which concern them very quickly. We will also develop an interface to give them the possibility to make query on other knowledge and resources.

	Parameterized activities			
	Problem formalization	Cause searching	Solution proposition	Solution implementation
<b>Assessor</b>	1	2	3	5
<b>Intellectual catalyst</b>	11	4	1	6
<b>Interaction moderator</b>	5	7	0	0
<b>Motivational support</b>	2	6	7	3
<b>Learning regulator</b>	5	10	4	0
<b>Technical support</b>	8	4	1	2
<b>Pedagogical architect</b>	1	5	0	0

Figure 3. Experiences matrix per function per phase

### 4.3 Organization of the global community supported by the platform

To develop and enable the community to survive, we must have leaders for each type of community previously defined. According to the emergence concept, we give tutors the possibility to determine themselves as leaders. A leader is:

- An expert (about a tutor function, a subject area or a type of activity).
- A moderator of the forum associated to the community.
- A referral agent for tutors who are in trouble (interactions by mail).

The leader has to choose useful forum threads to store in the database. A same tutor can become the leader of several different communities.

## 5. CONCLUSION AND FUTURE DIRECTION

We studied a new way to use ICT in education in order to help tutors to learn and develop competencies and expertise in the context of communities of practice. As members of CoPs, tutors can share their experiences and define good practices. All this knowledge will be easily accessible through our platform. Our interface enables tutors to rapidly retrieve the knowledge they need in the context of the activity they are monitoring.

Presently, we are developing this platform with the above described functionalities. At the same time, we are in contact with several tutors from different backgrounds who provide advice on the platform design. First, we will offer only one or two forums, in order to test the efficiency of the interface and the database. This experiment will give us first results to make the platform evolve.

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