Origins and Perspectives on Designing Virtual Communities of Practice for Permanent Education: A Case Study in the Collective Health Sector

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Abstract. With the advance of Information and Communication Technologies (ICTs), information sharing is getting faster. The use of ICTs facilitates the circulation of information and knowledge, but the cognitive ability and the capacity for innovation are not affected by the technology. By this mean, the communities of practice using traditional technological tools used in corporate, personal or relationship websites, only change their goals and forms of use. This paper describes the development of a conceptual interface to the community of practice platform used as support for Brazilian National Policy of Permanent Education in Health, of the Ministry of Health.

Keywords: Online communities · Telemedicine · Education in health · Interface design

1 Context: The Necessity of Permanent Education in Health

According to the Ordinance 198GMMS (BRAZIL, 2004), Permanent Education is work training, where learning and teaching are incorporated to daily organizations and work. It is proposed that the procedures for training of health workers take as a health reference, needs of individuals and populations, from sector management and social control in health, having as goals, the transformation of professional practices and the organization of work and being structured from the issues of work process.

According to Ceccim and Ferla (2014), Permanent Education in Health as "teaching-learning practice" means the production of knowledge in everyday health institutions, from the reality experienced by the actors involved, and the problems found in daily work and the experiences of these actors as the basis of questioning and change.

The work in health is a job of listening, in which the interaction between health professional and user is determinant in the quality of healthcare response. The incorporation of updated technology is urgent and constant, and new processes of decision-making have an effect on technological, scientific, social and ethic care responsibility on treatment or health monitoring. Healthcare requires permanent education (Ceccim and Feerwerker, 2004).

The Ministry of Health of Brazil (MS), created the National Policy of Permanent Education in Health (Ordinance No. 1,996 GMMS) in which determines that the health education issues become part of the many system assignments. Observing and carrying it out, the Ministry of Health has created and introduced several strategies and policies towards the adequacy of training and qualification of health workers to the needs of the population and development of Centralized Health System (*Sistema Unico de Saude* – SUS).

Thus, the Brazilian Government has invested in the construction of collaborative virtual learning environments for permanent education in health through community practices.

The communities of practice allow healthcare professionals to expand their knowledge through the formation of a collaborative network with focus on the improvement of the work. The exchange of experiences in virtual environments generates a multiplier effect that contributes to its training and mainly for the quality of service to the citizen.

In a country of continental dimensions such as Brazil, proper development and good use of virtual platforms facilitates the spread of information and promotes shared knowledge, rapidly and undeniable resources saving. In this way, virtual spaces create benefits for the whole of society, since professionals are linked to one of the rare single health systems all over the world and the coverage is a constitutionally guaranteed right to the entire population.

2   Learning in an e-Health Platform: Users and Roles

Social theory of learning is not exclusively an academic approach. A new framework about learning is important not only to those dedicated to study the theory, but also for all of us – teachers, students, parents, young people, health professionals, patients, managers, workers, citizens, politicians –that indifferent ways need to follow the phases of learning (to ourselves or to others) in our communities and organizations. (Wenger, 2008, p. 11)

Lacerda (2013) refers Sarangi (2010), that offers a new vision about the notion of activities and roles. Using as example a medical appointment, we expect some participation of these speakers. When the doctor asks `*How are you?*´ the meaning of this activity comes from the type of activity in which this dialogue belongs. In the same way, this question can be answered in many different ways to (re) define the role of patient and doctor in this relation (Sarangi, 2010, p. 2).

Completing this reflection about social interaction the authors cite that leaning must be understood as a social relation, as a process in which ' people are not only active participants in the practice of a community, but also develop their own identities when in that community.' (Hildreth e Kimble, 2002, p. 23 apud Albagli, 2007).

The usage of information and communication technology turns easy the circulation of information and knowledge, but the cognitive and innovative capacities are not affected by technology (Albagli, 2007). In this way, communities of practice use traditional technological tools, used in personal, corporate or social websites, changing only their objective and ways of utilization (Fiorio, 2011).

The interfaces required by communities of practice are identified by Wenger et al. (2005) considering the tensions in the relations among members and community (Fig. 1) generating three kind of necessities that define technological possibilities, that aim to attend the community members necessity: *Interaction* (synchronous and asynchronous), *Publication* and *Tendencies* (individual engagement and community growing). (Tavares; Ribeiro; Fiorio, 2011).

3   A Case Study of CoPPLA System

The system Communities of Practice Platform - CoPPla is a generic platform for construction of virtual communities of practice, providing a range of integrated communication and collaboration tools in an environment focused on knowledge sharing, where content creation and manipulation of objects is flexible and intuitive.

CoPPla is developed with Plone, a Content Management System (CMS) free and open source, written in Python language. Plone is among the top 2 of all open-source projects in the world, with more than 300 consultants in 57 countries. The project is actively developed since 2001. It is available for more than 40 languages and has the best safety record among the great CMS. (Plone, 2015).

CoPPLA platform provides resources for the management of the community, allowing the creation, storage, and access to its content and participants. The set of management tools, communication and publishing are configurable and involve the manipulation of texts, images, web pages, links, events, discussion forums and spaces for learning experiences. Users have the ability to create and manage their communities as a space for sharing knowledge, involving learning activities. The platform offers spaces for the creation of content and interaction between participants through:

a. Calendar: Where events can be created by participants and moderators
b. Collection: Storage of the general content of the community. Files and images can be inserted, links, pages and folders. Used for publishing collective productions;
c. Portfolio: Used for publishing individual productions, provides the creation of files, images and pages;
d. Tasks: Space for delivery of tasks (in educational contexts);
e. Discussion forum: In the communities, discussions may arise in comments of published items or through an environment of conversation that uses the Ploneboard product;
f. Notifications: Two forms of notification in communities are used. The first is a mechanism that allows moderators to send messages direct to the participants, and the second is through a daily summary of activities of the community sent by e-mail;
g. Users Profile: It displays information concerning the user as well as shared content;
h. List of participants: It displays the participants and moderators of the community. It is possible to research and access the profile of everyone;
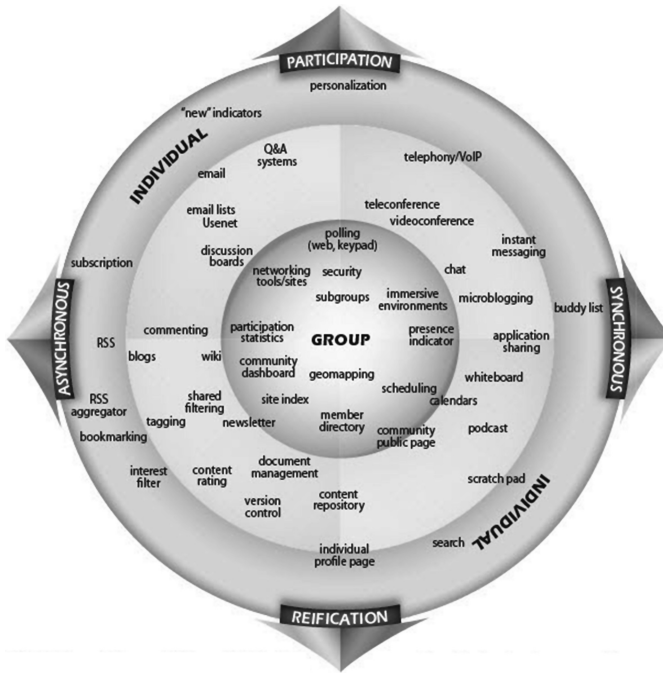i. Activity level: A tool designed to check the level of interaction in the community, both collective and individual;

Fig. 1. Relation between activities and technological tools in communities of practice (WENGER, 2013)

j. History: It stores all content produced by the participants, it allows to search for specific content by using filters such as, name, date of creation, who published it, among other issues.
k. Invitation: A tool for sending invitations via e-mail, where you can attach customized messages.
l. Community profile: Through the home page of a community you can find your name, image, description, list of participants and history.

3.1 User Experience (UX)

UX professionals want to create great experiences for users, therefore, they need to know something about them. This phrase, "meet your users" can be easily found in a quick study on literatures about use, ergonomics and throughout the universe of design concepts centered in the user. However, long before the term "user experience-UX" had become known, traders and the Marketing market were already concerned on meeting their users.

Porter (2014) describes that UX professionals are more focused on design than traders. People begin to consider the user experience, often as a response to a design

process that ignored their users. They become UX professionals to correct this mistake. They have seen how harmful a superficial understanding of users can be. That's why the phrase "meet your users" is so important to UX professionals.

Still according to Porter, UX can be compared to a good marketing. It is intended to know which is your market, what is important for them, and design accordingly. It is also to hear after having conceived and adjust to market changes. It is easy to recognize that when you consider that your users are the market you are designing. That's why good Marketing professionals can be part of the development of interaction design and UX professionals in the Marketing projects.

The development of CoPPLA consists of a multidisciplinary team composed of educators, psychologists, designers, programmers, communication professionals, administrators and information technology professionals who use their own community of practice to enhance the interaction and system tools collaboratively in a horizontal cooperation. Health professionals who promote the dissemination of knowledge and technological expertise in scientific network as well as the permanent education in health, are also part of this team.

3.2   Interface Design

The proposed interface exposes the main components that must be considered in the interaction of a community of practice in the context of permanent education in health. The platform has a set of users, teachers and health professionals who share their knowledge by ensuring the dynamics and functioning of the tool. To make sure that the tools used on the platform are intuitive is the aim of this work, in which shows the influence of design on the proactive participation of the user.

As illustrated in Fig. 2 a template that can be adapted to any content generated by the tools of the community, separated into three columns for easy adaptation to mobile devices. On the left are the tools of interaction, in the Center the latest posts or activities of the community and on the right the supporting information, such as monitoring of events and courses, just below, the preview of the participants of the community. All Visual elements compose modules that work in contrast with the background, enabling perception of visual hierarchy intuitively. In addition, the use of modules overlapped to each other, allows easy visual adaptation for applying sub-groups of communities to the system, if necessary.

4   Beyond the Interface: An Interaction Is Really Happening?

Distance Education (DE) explore certain techniques of distance learning, including hypermedia, interactive nets and all intellectual technologies of cyber culture. However, the essential is the new style of pedagogy that favor at same time personalized and collective learning in the same net. In this context, the teacher is an animator of the collective intelligence of their students instead of a direct provider of knowledge (LÉVY, 2008, p. 158)

Fig. 2. Template for community of practices

Nevertheless even using so many resources can be questioned if the teacher or supervisor can act as a facilitator of the group knowledge and students as agents of the collective intelligence.

Fig. 3. Post of the main educator of the community and one tutor. Attitude and language defines the relationship with advisors and tutors.

It´s necessary to clear that the participant's roles in a community are organized according to a hierarchy: educator, advisor, tutor and health agent (student). In this paper, a dialogue between an educator and two advisors will serve as a scenario.

Educator begin her activity (Fig. 3) creating the identity of a 'supervisor'. She insists in the importance of debates between advisors and tutors, avoiding an authority or impatient key. However, when writing, words express dissatisfaction, using a charge key, and including in her speech standards and politics of the Ministry of Health, while insisting that her demands must be complied.

This kind of speech occurs when speaker is not certain if will be attended if not making some pressure, or a standard is not being complied (Oliveira, 1995). Speaker creates and identity of doubts, insecurity, asking for advices, putting in question her role. In other contexts, suggestion is a directive that dissimulates the imposition of the force. (Oliveira, 2001).

As a *domino effect*, the advisor also criticize tutors, by the same reason that the educator criticized him: the lack of interaction between users.

At this moment, the advisor defines a new identity, matching with the educator that posted initially the critic about the group, but seeming that she does not belong that group. He ignored that was criticized, and automatically created a new identity in the hierarchy starting his critics with the tutors, that were ´below´ him.

Dialogue continue with each one (Fig. 4) creating their own identities and strengthen the critic about the other professionals.

It is not a formal text. It´s not a conversation. It is an artificial text. Again, an identity is created to him, and to the other one, that is a subordinated. Speech is polite and professional. He gives some clues doing vague references about alternatives to increase system interaction. However, he uses words as 'I believe that' to give suggestions, but not any real or specific action.
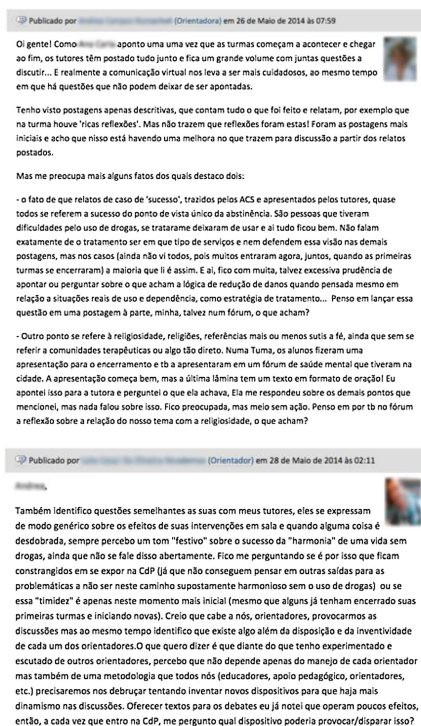
Fig. 4. (on the left) and 5 (on the right) – Posts of the tutors, answering the educator.

"What I want to say is that once considering the experience and the speech of other advisors, I believe that it depends not only on each advisor, but also on a methodology including all of us (educators, pedagogic staff, advisors, etc.) "

In addition, quoting somebody else, he uses the comments of another person to exemplify his critique, and in the end, he mentions:

"we need to invent new devices that can put some dynamism into the discussions".

Willingly statements are weaker than the ones related to the necessity, once the will of a real action is expressed using an affirmative of sincerity. In this case, he´s in the middle, his post is a hint, but without being committed to it. In the end, he affirms that the problem exists but the responsible are the tutors.

5 Final Comments and Future Work

A study of interface design based on the needs of the community of practice platform for permanent education in health and in the specifications of the tools that make up the system was presented in this work.

The interface design presented, offers a modular structure easily adaptable to the tools and functionalities of the platform through a set of visual solutions using contrast

techniques between figure and background, making the hierarchy of information intuitive for the end user.

Analyzing the interaction posts between advisors in communities of practices comes out the information that identities are not clear. Hierarchy is confused and difficult to them to deal with.

The proposition of a community of practice is not being developed as the proposed concept. There's no interaction. There´s professional speeches, no commitments. The lack of interaction tights the permanent system of education.

Discussions take days, weeks, once a couple of days is necessary between a post (question) and the opinion of other members of this community. Using a real-time chat could minimize this problem. Alternatively, system could accept voice records. This resource could also facilitate the system usage by visual impaired users, making the system more accessible.

This paper presented just a small interaction between advisors and in a determined community of practice. A wider observation of this interaction must be carried out to understand and follow the dialogues' evolution of users in this system.

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