A theoretical framework for building online communities of practice with social networking tools

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Abstract—This paper proposes a theoretical framework as a foundation for building online communities of practice when a suite of social networking applications referred to as collective intelligence tools are utilized to develop a product or solutions to a problem. Drawing on recent developments in Web 2.0 tools, research on communities of practice and relevant theories of learning, and the authors own action research experience in collaborative knowledge creation using Web 2.0 tools, this paper discusses a learning community’s spiraling process as it moves from a given sociocultural context through discourse, action, reflection, and reorganization toward socially mediated metacognition.

I. INTRODUCTION

The evolution of the World Wide Web from Web 1.0 to Web 2.0 is creating subtle but profound changes in the ways human beings locate and access information, communicate with, and learn from each other. The changes in technologies are driving changes in human behavior, interactions, and knowledge acquisition. The paradigms for learning have already evolved beyond traditional classroom models to synchronous and asynchronous, interactive, and collaborative learning, which is further extended by Web 2.0 tools and social networking approaches. However, recent developments in Web 2.0 technologies are far outpacing the development of theoretical frameworks for their utilization in education and training. According to Kamel Boulos and Wheeler (2007), “the second incarnation of the Web (Web 2.0) has been called the ‘Social Web’ because, in contrast to Web 1.0, its content can be more easily generated and published by users, and the collective intelligence of users encourages more democratic use” (p.2).

Definition of social networking

We define social networking as the practice of expanding knowledge by making connections with individuals of similar interests. In the Web 2.0 environment social networking is linked to technological services and software that make it possible for people to communicate with others from anywhere, at any time. Social networking refers to sites such as Facebook, MySpace, and LinkedIn, where users set up a profile, create formal connections to people they know, communicate, and share preferences and interests. A very popular social networking site that provides a 3-D virtual environment where users interact through avatars is Second Life. Sites such as YouTube and blogs are classified as social publishing; Del.icio.us and Bibsonomy are categorized as social bookmarking; Folksonomy and Tag Clouds fall into the category of social cataloging. Of great interest to online educators is the wiki, referred to as a collective intelligence tool that enables collaborative editing of documents on the Web. Combining wikis with several other social networking applications creates a powerful environment for communication and learning.

Purpose

The purpose of this paper is to attempt to develop a theoretical framework to understand learning among groups of individuals that utilize social networking applications to work towards a common goal. We define social networking technology as tools that facilitate collective intelligence through social negotiation when participants are engaged in shared practice. Smith (1994) used the term collective intelligence to describe, “how groups of individuals can occasionally and under particular circumstances meld their thinking into a coherent whole” (p.1).

Method

In order to develop a theoretical framework for understanding learning in social networking environments we adopted two methods: a literature review of learning theories and action research of our own exploration of social networking tools as we developed into a community of practice to compose this paper. We began with a consideration of Wenger, McDermott, and Snyder’s (2002) CoP model to understand the structure of social networking and went on to conduct a review of literature that examined sociocultural and related theories of learning. At the same time we explored social networking through demonstration and practice as we developed as a learning community. The focus was on learning through interaction while utilizing the tools.

CoP as a structure for online social networking

Wenger et al. (2002, p.4) defined communities of practice (CoP) as, “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.” According to Wenger (1998), a CoP defines itself along three dimensions: what it is about-its joint enterprise as understood and continually renegotiated by its members; how it functions-mutual engagement that bind members together into a social entity; what capability it has produced-the shared repertoire of communal resources that members have developed over time (see also Wenger, 1998, pp. 73-84). The three structural elements of CoP described by Wenger et al. (2002) - (1.) domain, (2.) community, and (3.) practice - help us organize the theoretical frameworks identified as supporting learning in social networking environments. When these three elements function well together, they make a CoP an ideal “knowledge structure” - a social structure that can assume responsibility for developing and sharing knowledge (p. 29).

Domain

Social networking technologies present a forum for discussion and interaction. The domain represents common ground where participants share their ideas, knowledge, and stories. The Appreciative inquire (AI) theory for organizational change, based on social constructionism and social constructivism frameworks is founded on the Anticipatory Principle (Magruder Watkins & Mohr, 2001), which identifies collective imagination and discourse about feelings as important resources for generating constructive change or improvement. As participants engage in the domain, a shared understanding can develop, in the best case, a domain creates personal meaning and strategic relevance (Wenger et al., 2002).

Community

“The community creates the social fabric of learning” (Wenger et al., 2002, p. 28). The community is a group of people who learn and interact together, building relationships that result in a feeling of belonging and mutual commitment (Wenger, 1998). Together we create structures and images of what we anticipate for the future. Social networking tools like wikis and blogs can help to build community through dialogue and conversation, selectively making sense of past and present experiences.

Practice

Whereas the domain denotes the topic the community focuses on, the practice is the specific knowledge the community develops, shares, and maintains (Wenger et al. 2002). When collaborating using Web 2.0 technologies, users adjust to the new interactive technological environment and they will do so either in ways that reveal native cultural values, or reflect the creation of new cultural norms and conventions. The nature of the tool that mediates communication impacts and alters their perceptions of the communication process as well, and how they perceive their social roles. As Joinson (2003, pp. 2-3) observes “tools are more than just something to make a task easier. They change your way of thinking, of approaching a task (and indeed the nature of the task itself), and can reap unimagined wider social changes.” Vygotsky (1978, p. 29) referred to this as “mediation” and argued that when we interact with each other using tools we allow for the extension of human capabilities. Therefore, the social networking tools we use will change how we think, how we learn, and how we interact with each other.

Understanding learning in a CoP

How does learning happen within the structural framework of a CoP? Lave and Wenger (1991, p.100) state that “because the place of knowledge is within a community of practice, questions of learning must be addressed within the developmental cycles of that community.” In this section we discuss the learning theories that played a role in our own learning process as a CoP.

Sociocultural and socio-constructivist approaches to learning (Vygotsky 1978; Wertsch, 1991), provided the foundation. Activity theory, which emerged from the work of Vygotsky, Leont’ev, and their colleagues in the Russian cultural-historical tradition assume that mental processes are situated in broader cultural and social contexts, and should be studied within these contexts. Activity theory is built upon several key concepts that are useful for understanding learning through collaboration in social networking environments. These include situated activity, mediating devices, and the zone of proximal development (ZPD). As a CoP we first discussed our context and domain. We were a group of doctoral students working with an instructor in an advanced instructional technology course to develop this paper using social networking tools as well as face-to-face interactions. The focus was on student-generated content with the instructor acting as a partner in the learning process. We discussed our cultural frameworks, strengths, and experiences and used a wiki as a mediating device to communicate our ideas on the domain.

Zone of proximal development (ZPD)

Social networking tools mediate between the knowledge of the individual and their contribution to knowledge building within the community. Learning to navigate an online social networking site challenges the novice and creates a ZPD “the distance between the actual developmental level as determined by independent problem solving under adult guidance or in collaboration with more capable peers” (Vygotsky, 1978, p. 86). In an online environment, the ZPD is often scaffolded by tutorials and a help option that guides the user in correct navigation and procedures. Expert
knowledge is situated within the environment through tools and interaction between participants of the network. Peer-to-peer and instructor-to-student mentoring became a key element of our CoP. A more experienced peer developed a tutorial on how to use wikis and del.icio.us and posted it for the benefit of the group.

**Group ZPD**

We propose that in addition to an individual ZPD scaffolded by technological tools, social networking sites create a collaborative ZPD among participants. Goos, Galbraith, and Renshaw (2002) distinguish between the traditional expert-novice interaction and interaction between individuals of equal status. They define this peer collaboration as “mutuality,” an interactive process encompassing varied reasoning, comparing their own ideas with others as we did in the wiki. Peer feedback on peer contributions enhanced this learning process. Smith (1994) uses the term group-mediated cognition (GMC) to describe the form of situated thinking whereby the thinking of each individual is inevitably influenced by the thinking of the other members taking part in the activity, even if it only to disagree. He notes that GMC takes place within basic cycles of interaction between the individual and the group. Mason and Rennie (2008) point out that what is different about Web 2.0 collaborative technologies is that interaction, peer commentary, and collaborative research actually happen in a distributed global environment. “Knowledge is created, shared, remixed, repurposed, and passed along. In short, Web 2.0 is a research network as well as a learning network” (p. 10).

**Metacognition**

Metacognition is defined by Driscoll (2000, p.110) as “one’s awareness of thinking and the self-regulatory behavior that accompanies this awareness.” Social networking technologies promote “active and engaged learning, where participants construct knowledge through social interaction and exploration” (Kamel, Boulos, & Wheeler, 2007). The power users have to manage knowledge at their own pace supports the self-regulated nature of metacognition (Michalsky, Zion, & Mevarech, 2007). Those technologies also present the opportunity for learners to reflect on their ideas, organize resources, provide evaluative feedback to others, and build communities of knowledge. Our collaborative development of this paper in a wiki is an example of social networking that facilitates metacognitive development.

Having discussed a selection of learning theories that hold promise for understanding learning in CoP’s we propose a theoretical framework for understanding learning in social networking environments.

Spiraling toward socially mediated metacognition as a CoP: a theoretical framework

In proposing a theoretical framework for collaborative learning with social networking tools, we draw on the learning theories discussed earlier and our own experience. We first discuss the Web 2.0 tools a CoP can use to build a learning environment and then identify five phases in the learning process of a CoP: context, discourse, action, reflection, and reorganization that leads to the sixth phase, socially mediated metacognition, as seen in Figure 1. These phases can progress in multiple iterations as more users join and contribute to the wiki resulting in an evolving process of collective intelligence gathering.

![Figure 1: Social Networking Spiral](image-url)

In this framework, the spokes of the learning wheel revolve around a wiki. Wikis provide the setting for collaborative knowledge building and group metacognitive development. Each of the following Web 2.0 tools can be used in conjunction with wikis to enhance the quality of the learning process: Facebook enables social networking by connecting learners via personal profiles complete with photographs and built-in methods of communicating. CommunityWalk creates a visual tracking system by identifying the location of the users. Del.icio.us keeps a record of references built through active participation; learners can post their research.
Having created the virtual learning environment with Web 2.0 tools we next discuss the proposed phases in the learning process of a CoP.

**Context**

We propose that the process of collective intelligence creation initiates in context, the context of the site and the context of individuals using the site. “Most knowledge is an interpretation of experience, an interpretation based on schemas, often idiosyncratic at least in detail, that both enable and constrain individuals’ processes of sense-making” (Resnick, Levine, & Teasley, 1991, p.1).

**Discourse**

Each discourse is shaped or in Wenger’s terminology, “negotiated” (Wenger, 1998, p.52), to help shape meaning, and it is in analyzing these discourses that one can see how identity and power intertwine to negotiate meaning (Barton & Tusting, 2005). As a CoP we developed our own way of using language to determine meaning.

**Action**

The action phase initiates the process of socially mediated cognition. Participants identify a leaning goal and through tool use connect with others that share the goal, agreeing to tasks to accomplish it. In order to develop this paper we came together as a community and identified the goal of investigating learning in social networking environments.

**Reflection**

The reflection phase is characterized by the interaction of personal experience and group thinking and focuses on the consideration and integration of unfamiliar points of view. As an action research group, we embodied this step by reviewing the wiki postings and discussing the relevance of the learning theories proposed.

**Reorganization**

The reorganization phase follows the reflective process as members bring new understanding and insight to advance the shared goal. Participants adjust meanings and content within the environment. Mediated by interactive technology, the process of shared meaning advances, participants reflect on and adjust their understanding, and a concrete expression of shared metacognition is revealed.

**Socially mediated metacognition**

The previous five phases lead to socially mediated metacognition where the CoP is able to mutually reflect on our reasoning and developmental process. A key feature of this peer-to-peer learning was mutuality - the reciprocal process of exploring each other’s reasoning and viewpoints in order to construct a shared understanding. This shared understanding established a “collaborative zone of proximal development” (Goos, Galbraith, & Renshaw, 2002, pp. 197-198). The wiki facilitated socially mediated metacognition by enabling us to reflect on our development process as a group, as we critiqued each version of the paper edited by group members. Our mutual reflection on our group learning and development process, the Web 2.0 tool use, and the worthiness of our approaches to achieving the group goal all facilitatied socially mediated metacognition.

**REFERENCES**


