Collaborative Web-Based Learning Community

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INTRODUCTION

Because of the ever-changing nature of work and society under the knowledge-based economy in the 21st century, students and teachers need to develop ways of dealing with complex issues and thorny problems that require new kinds of knowledge that they have never learned or taught (Drucker, 1999). Therefore, they need to work and collaborate with others. They also need to be able to learn new things from a variety of resources and people and investigate questions, then bring their learning back to their dynamic life communities. There have arisen in recent years *learning-community* approaches (Bereiter, 2002; Bielaczyc & Collins, 1999) and *learning-ecology* (Siemens, 2003) or *information-ecology* approaches (Capurro, 2003) to education. These approaches fit well with the growing emphasis on lifelong, life-wide learning and knowledge-building works.

Following this trend, Internet technologies have been translated into a number of strategies for teaching and learning (Jonassen, Howland, Moore, & Marra, 2003) with supportive development of one-to-one (e.g., e-mail posts), one-to-many (such as e-publications), and many-to-many communications (like videoconferencing). The technologies of computer-mediated communications (CMC) make online instruction possible and have the potential to bring enormous changes to student learning experiences in the real world (Rose & Winterfeldt, 1998). It is because individual members of learning communities or ecologies help synthesize learning products via deep information processing, mutual negotiation of working strategies, and deep engagement in critical thinking, accompanied by an ownership of team works in those communities or ecologies (Dillenbourg, 1999). In short, technology in communities is essentially a means of creating fluidity between knowledge segments and connecting people in learning communities. However, this Web-based collaborative learning culture is neither currently emphasized in local schools nor explicitly stated out in intended school-curriculum guidelines of formal educational systems in most societies. More than this, community ownership or knowledge construction in learning communities or ecologies may still be infeasible unless values in learning cultures are necessarily transformed after the technical establishment of Web-based learning communities.

BACKGROUND

Emergence of a New Learning Paradigm through CMC

Through a big advance in computer-mediated technology (CMT), there have been several paradigm shifts in Web-based learning tools (Adelsberger, Collis, & Pawlowski, 2002). The first shift moves from a *content-oriented* model (information containers) to a *communication-based* model (communication facilitators), and the second shift then elevates from a communication-based model to a *knowledge-construction* model (creation support). In the knowledge-construction model, students in a Web-based discussion forum mutually criticize each other, hypothesize pretheoretical constructs through empirical data confirmation or falsification, and with scaffolding supports, coconstruct new knowledge beyond their existing epistemological boundaries under the social-constructivism paradigm (Hung, 2001). Noteworthy is the fact that the knowledge-construction model can only nourish a learning community or ecology, and it is advocated by some

cognitive scientists in education like Collins and Bielaczyc (1997) and Scardamalia and Bereiter (2002). Similarly, a Web-based learning ecology contains intrinsic features of a collection of overlapping communities of mutual interests, cross-pollinating with each other and constantly evolving with largely self-organizing members (Brown, Collins, & Duguid, 1989), in the knowledge-construction model.

Scaffolding Supports and Web-Based Applications

According to Vygotsky (1978), the history of the society in which a child is reared and the child's personal history are crucial determinants of the way in which that individual will think. In this process of cognitive development, language is a crucial tool for determining how the child will learn how to think because advanced modes of thought are transmitted to the child by means of words (Schütz, 2002). One essential tenet in Vygotsky's theory is the notion of the existence of what he calls the zone of proximal development (ZPD). The child in this *scaffolding* process of ZPD, providing nonintrusive intervention, can be an adult (parent, teacher, caretaker, language instructor) or another peer who has already mastered that particular function. Practically, the scaffolding teaching strategy provides individualized supports based on the learner's ZPD. Notably, the scaffolds facilitate a student's ability to build on prior knowledge and internalize new information. The activities provided in scaffolding instruction are just beyond the level of what the learner can do alone. The more capable peer will provide the scaffolds so that the learner can accomplish (with assistance) the tasks that he or she could otherwise not complete, thus fostering learning through the ZPD (Van Der Stuyf, 2002).

In Web-based situated and anchored learning contexts, students have to develop metacognition to learn how, what, when, and why to learn in genuine living contexts, besides problem-based learning contents and methods in realistic peer and group collaboration contexts of synchronous and asynchronous interactions. Empirical research databases illuminate that there are several levels of Web uses or knowledge-building discourses ranging from mere informational stages to coconstruction stages (Gilbert, & Driscoll, 2002; Harmon & Jones, 2001). To sum up, five disintegrating stages of Web-based learning communities or ecologies are necessarily involved in Table 1.

Noteworthy is that the students succeed in developing scaffold supports via ZPD only when they attain coconstruction levels of knowledge construction, at which student-centered generation of discussion themes, cognitive conflicts with others' continuous critique, and ongoing commitments to the learning communities (by having constant attention and mutual contributions to discussion databases) are emerged. It should be noted that Web-based discussion or sharing in e-newsgroups over the Internet may not lead to communal ownership or knowledge construction.

Key Concepts of Communities of Practice

Unlike traditional static, lower order intelligence models of human activities in the Industrial Age, new higher order intelligence models for communities of practice have emerged. Such models are complex-adaptive systems, employing self-organized, free-initiative, and free-choice operating principles, and creating human ecology settings and stages for its acting out during the new Information Era. Under the technological facilitation of the Internet, this new emerging model is multicentered, complex adaptive, and self-organized, founded on the dynamic human relationships of equality, mutual respect, and deliber-

Table 1. Five disintegrating stages of Web-based learning communities

Disintegrating stages	Distinctive Features
Informational Level	Mere dissemination of general information
Personalized Level	Members' individual ownership in the communities
Communicative Level	Members' interactions found in the communities
Communal Level	Senses of belonging or communal ownership built up
Co-construction Level	Knowledge-construction among members emerged