SSM–Based IS Support for Online Learning

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INTRODUCTION

Imagine attending a class where the instructor, after giving an introduction of what the course is entailed, invites you to visit the Web-based course support environment (Vat, 2001). On entering the online environment, you are offered the privilege of creating your own personal space in the form of a customizable information system (IS), guarded by your personal self-assigned identifier and password. Within the personal electronic space, you are furnished with a whole set of tools to experience your learning in the subsequent course enactment (Vat, 2000). Perhaps, you may discover that this support environment is just one of the many environments available for each course offered. Indeed, each such environment is embedded inside the course organizational space, and your personal space is designed such that once inside your own electronic space, you can manage as many courses as you want. Your personal space is like your private workspace, in which you have to perform, keep track of and manage your learning activities. More excitingly, you are given the opportunity to participate in teamwork in the course you are enrolled. This is demonstrated by the provision of possible group spaces associated with the course. Each group space is often called the course collaborative space. Consequently, in your personal space, you can have access to many course organizational spaces, and the respective collaborative spaces installed for such courses (Vat, 2004). Let us further assume that group-based project work is considered as an essential component of the course you are taking. And your instructor has just uploaded the latest information on problem-based learning (PBL) to the course organizational space for your first research assignment. Thereby, it should be worthwhile to begin exploring the context behind the IS support (Vat, 2002a, 2002b), which aims to develop in the learners their abilities to learn, to engage in collaboration, to appreciate multiple perspectives, to evaluate and to actively use and construct knowledge in such an environment.

THE BACKGROUND OF CONSTRUCTIVIST CONCERNS

It is experienced that the conventional approach to education remains the instructivist one, in which knowledge is perceived to flow from experts to novices (Booth, 2001). This transmissive view of learning is most evident in the emphasis on lectures, in the use of textbooks to prescribe reading, and in the nature of tutorials and assessment methods. It assumes that the process of good teaching is one of simplification of the truth in order to reduce student confusion. Yet, this simplification could deny students the opportunity to apply their learning to dynamic situations.

We often question the transferability of the instructivist learning and ask how much of that assigned to academic learning ever gets applied to actual scenarios, when there is such a rapid surge in knowledge commonly associated with the birth of the Internet age. This is a transference problem. Actually, the content product of learning is assuming a less-important role relative to the process of learning as the life of information content shortens and the need for continual learning increases. Relatively recent discussions in the literature (Cobb & Yackel, 1996; Marshall, 1996; O' Connor, 1998; Vygotsky, 1978) suggest that learning is increasingly viewed as a constructive process occurring during one's participation in and contribution to the practices of the community of learners. This is supported by a current shift (Brown, Ash, Rutherford, Nakagawa, Gordon, & Campione, 1993) from the cognitive focus on knowledge structures presumed in the mind of the individual learner to a constructivist focus on the learner as an active participant in a social context. Indeed, we have been witnessing

classroom culture being shifted away from the obsession with knowledge reproduction and enriched with tools such as the Web-based search engines that mediate knowledge building and social exchanges among peers as participants in discourse communities (Bonk, Medury & Reynolds, 1994; Bonk & Reynolds, 1997; Fabos & Young, 1999). These communities open opportunities for learners to interact with multiple perspectives that challenge their existing knowledge constructions and impose cognitive conflicts (Piaget, 1952) requiring negotiations.

Our literature review also indicates that PBL, considered as an instance of the constructivist pedagogy, represents a promising relief from the instructivist tradition. Greening (1998) describes it as a vehicle for encouraging student ownership of the learning environment. There is an emphasis on contextualization of the learning scenario, providing a basis for later transference, and learning is accomplished by reflection as an important meta-cognitive exercise. Besides, the execution of PBL, often done via group-based project work, reflects the constructivist focus on the value of negotiated meaning. More importantly, PBL is not confined by discipline boundaries, encouraging an integrative approach to learning based on requirements of the problem as perceived by the learners themselves.

THE LEARNING CONTEXT FOR IS DESIGN

Although, as demonstrated in numerous studies (Evensen & Hmelo, 2000), PBL is the kind of group-based project work recognized as having many educational and social benefits – in particular, providing students with opportunities for active learning – it is our experience that teaching, directing and managing such project work is not at all an easy process. PBL projects demand considerable supervision and technical resources, and the process must combine design, human communications, human-computer interaction and technology to satisfy objectives ranging from consolidation of technical skills through provoking insight into organizational practice, teamwork and professional issues, to inculcating academic discipline and presentation skills.

In preparing students to get started with group-based project work, we need the kind of course support whose characteristics must be delineated and thoughtfully designed in a practical learning scenario to stimulate any learner-centered involvements. Our discussion renders some perspectives behind providing such course support, through describing the idea in setting up a Center for PBL Support whose operations are to be realized through the appropriate design of IS support (Kimball, 1995) for the communities of both the students and the instructors, respectively.

The PBL Paradigm of Investigation

PBL, according to Bruer (1993) and Barrows (1986), is designed to actively engage students, divided in groups, in opportunities for knowledge seeking, for problem solving and for the collaborating necessary for effective practice. At the heart of PBL is a set of group-based activities, including climate setting, starting a problem, following up the problem and reflecting on the problem (Barrows, 1985, 1988). A brief description of the PBL model of investigation is presented below.

The Climate Setting Phase

At the outset, before the PBL group work begins, students must get to know one another, establish ground rules and help create a comfortable climate for collaborative learning. Meeting in a small group for the first time, students typically introduce themselves, stressing their academic backgrounds to allow facilitators and each other to understand what expertise might potentially be distributed in the group. The most important task is to establish a non-judgmental climate in which students recognize and articulate what they know and what they do not know.

The Problem Initiation Phase

The actual PBL episode begins by presenting a group of students with minimal information about a particular problem. The students then query the given materials to determine what information is available and what they still need to know and learn to solve the problem. During this phase, students