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COLLABORATION PROCESS PATTERNS AND INTEGRATED ASSESSMENT IN E-LEARNING ENVIRONMENTS

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ABSTRACT

Collaboration activities are particularly difficult in e-learning environments, where the intention is to provide students with valuable learning experiences through working in teams and sharing a common goal. These activities are often conducted in an ad hoc manner with lack of proper assessment and control over learning outcomes. In this article, we propose the idea of enhancing the effectiveness of collaborative e-learning practices through structured collaborative e-learning processes and integrated assessment mechanisms. The structuring of collaboration processes is suggested through the application of successful collaboration process patterns, while the integrated assessment is suggested through assessing not just the end learning outcomes, but also the process leading to those learning outcomes. These structured templates are regarded as collaborative e-learning templates (CET) that may be instantiated using common collaboration tools to generate desired collaboration patterns among e-learners. Thus, the research objective involves improving the learning outcomes as well as the collaboration process dynamics through novel application of collaboration process patterns and integrated assessment techniques. This research is currently in progress and we are conducting a pilot study to test the feasibility of the proposed ideas.

Keywords (Required)

Collaboration Engineering, Assessment, E-Learning, Process Patterns, ThinkLets

INTRODUCTION

Collaboration activities are commonplace in classroom settings, with the intention to provide students valuable learning experiences through working in teams and sharing a common goal. Collaboration is valued so highly because of the skills that can be fostered such as teamwork, problem-solving, communication and leadership. Collaboration has also shown to increase active learning, comprehension, retention of information, higher levels of student motivation and achievement. In certain instances, collaboration can be seen to increase the learning outcomes of the individual student and the collective group, while it is seen to break down in other cases. While providing such experiences through face-face collaboration in the classroom is a challenge in itself, distributed learning environments such distance learning greatly exacerbate the challenge. Several technological tools are available that do not provide

any structured guidelines for fostering collaborative learning. This phenomenon forms the fundamental motivation behind this research.

In this article, we propose the idea of enhancing the effectiveness of collaborative e-learning practices through structured collaborative e-learning processes and integrated assessment mechanisms. The structuring of collaboration processes is suggested through the application of successful collaboration process patterns, while the integrated assessment is suggested through assessing not just the end learning outcomes, but also the process leading to those learning outcomes. These structured templates are regarded as collaborative e-learning templates (CET) that may be instantiated using common collaboration tools available as either standalone or as a feature set of typical course management systems. This instantiation is hoped to generate desired collaboration patterns among e-learners. Thus, the research objective involves improving the learning outcomes as well as the collaboration process dynamics through novel application of collaboration process patterns and integrated assessment techniques.

BACKGROUND

Applications of information technology for collaborative learning are being researched under the broad umbrella of computer supported collaborative learning environments (CSCL) (Gress et al. 2008, in press) as well as extensions of computer-supported cooperative work (CSCW) (Daradoumis et al. 2006). Several findings from these areas have provided valuable insights for improving e-learning activities. For example, the basic notion of collaboration is motivated by the fact that each student in the group can potentially bring to the group different experiences, backgrounds and expertise that can be used collectively to perform a task. However, numerous mechanisms to define, design, and execute collaborative activities makes e-learning collaboration a challenging problem. Moreover, interacting effects of parameters such as group size, length of activity, underlying process structure, and intended outcomes renders the dynamics of a given collaborative e-learning activity complex.

It has been shown that there are many advantages to using collaboration activities as an e-learning tool. These advantages occur when the activities have been organized and facilitated properly. If these two fundamental constructs do not occur, it significantly reduces the chances that students will reach the learning objectives set for the activity. In many cases there is little time or effort spent on actually teaching the fundamental basics of successful group work in order to prepare students for the process (Randall, 2006). There is also not enough time spent on the process structure underlying the activity which results in unclear or unrealistic goals, lack of management, conflicts and unequal participation. Some of the basic problems include: free-riding, poor grading schemes, behavioral problems, inferior skills, lack of leadership, specialization of skills, scheduling conflicts, transaction cost issues, and stifling of individual creativity (Randall, 2006). The pitfalls of collaboration such as air time fragmentation, conformance pressure socializing, domination, incomplete task recognition observed in business settings can also provide an insight into why learning outcomes are often times not met in collaborative learning activities (Nunamaker Jr. et al. 1991).

Current assessment practices of collaboration e-learning activities include a combination of self review, peer review and the grade given to the final outcomes such as a project report (Gress et al. 2008, in press). Based on many of the pitfalls that occur with collaborative e-learning activities, this practice is inadequate. Student self assessment of their performance can be inflated and peer review processes can be subject to bias and validity problems (Sigi et al. 2005). The majority of the time collaboration activities are also not evaluated until the conclusion of the activity. This process does nothing to eliminate the problems occurring in the group during the collaboration process. Students often wait to use the peer evaluation at the conclusion of the activity to punish poor students rather than confront them earlier (Sigi et al. 2005). Assessment in collaborative e-learning environments may take any combination of the following forms; assessing the individual about the individual, assessing the individual about the group and assessing the group as a whole (Gress et al. 2008, in press).

Professional facilitators are noted to play a key role in successful collaboration activities (Bostrom et al. 1993; Niedeman et al. 1996). Lack of availability of skilled facilitators has shown to negatively impact the outcomes of collaboration. In fact, the role of facilitator is one of the primary reasons for lack of sustained use of collaboration tools in many organizations (Briggs et al. 2003). Analogously, in e-learning settings, most often the instructor plays a passive role of providing the requirements for the deliverables from the collaborative activity, and the students are on their own in terms of facilitating the collaboration activity. It is the instructor's responsibility to design tasks that help students discover and take advantage of groups in order to increase the potential learning of each individual in the group (Bormann, 2000). This seems to be another reason for lack of expected learning outcomes from collaborative learning activities.

In response of the issue of lack of professional facilitators, researchers have been recently pursuing the idea of providing documented successful facilitation nuggets to a practitioner, who does not have expert knowledge of group facilitation techniques (Briggs et al. 2001). This has led to emergence of collaboration engineering, which is "an approach to the design of re-usable collaboration processes and technologies meant to engender predictable success among practitioners of recurring mission-critical collaborative tasks" (de Vreede et al. 2005).

In order to achieve collaboration engineering goals, the concepts of thinkLets was introduced. Essentially, thinkLets are packaged, repeatable, and transferable facilitation techniques that can be deployed to create predictable patterns of collaboration among a group of people with a shared goal, during a collaborative process (de Vreede et al. 2006). Each thinkLet supports one or more of the six general descriptive patterns of thinking in performing an intellectual task collaboratively, namely generate, reduce, clarify, organize, evaluate, and build consensus (Briggs et al. 2003; Briggs et al. 2006; de Vreede et al. 2005). Like design patterns, thinkLets serve multiple purposes in the design and deployment of collaboration processes (de Vreede et al. 2006). They encapsulate best practices in facilitating collaborative processes and thus serve as units of intellectual capital.

RESEARCH APPROACH

In this research, we leverage the collaboration engineering approach for the design of collaborative e-learning activities. The underlying premise is that instructors engage in recurring collaborative activities for various courses. A structured collaborative process designed using CETs for conducting collaborative e-learning activities in a particular class may be reused or adapted in future. Each CET would consist of collaboration process template consisting of one or more thinkLets adapted to the e-learning setting, and integrated with assessment practices best suited to the context at hand. Moreover, each CET would be associated a prescribed set of technology features that may be deployed with available groupware tools. Essentially, CETs are envisioned as collaboration process templates targeted to the education domain that may be reused by educators to meet their specific learning outcomes and assessment goals.

In most instances of collaborative e-learning activities, conventionally the instructor (analogous to a facilitator) provides the student group the task and a few instructions and is then removed from the process. CETs can allow instructor to administer more control over the collaboration process structure and allow the desired collaboration patterns to emerge resulting in better assessment of both the anticipated learning outcomes and the collaboration process.

In order to improve the assessment process for group collaboration, CETs can be structured to consist of smaller steps in the overall collaborative activity with prescribed performance milestones. For example, in a brainstorming related step, each student may be required to contribute at least five unique ideas to achieve the maximum points for the exercise. From an assessment perspective, such structuring can allow better evaluation of students in the collaboration activity, and likely overcome the drawbacks of traditional peer review evaluation system such as personal politics and biases.

We have conducted a survey within our institution to analyze the different collaborative learning activities and their characteristics undertaken. We next plan to design an experiment with a goal to compare two similar collaborative e-learning projects, one designed using CETs and one designed using conventional

collaborative e-learning practices. Initially, a pilot study will be carried out, which would begin by revisiting the design of the experiment, conducting the experiment, data analysis, and interpretation of results.

DISCUSSION AND CONCLUSIONS

As mentioned earlier, the overall outcome of these objectives is to provide educators with a means for successfully conducting collaborative learning activities in an e-learning environment. In fact, characteristics of distance education environments are becoming increasingly pervasive even in on-campus settings as information technology based tools become the preferred medium of interaction for younger generations. It is observed that many campus students groups tend to work online through the use of collaboration tools and hardly meet face-face, indicating the reduced gap between on-campus and e-learning settings, as far as collaborative learning activities are concerned. Thus, an improved way of conducting technology-infused collaboration activities can have significant benefits.

In this article, we have proposed an application of collaboration process patterns and integrated assessment practices in e-learning environments in order to improve learning outcomes and assessment process. This research is currently in progress and we are conducting a pilot study to perform preliminary assessment of the proposed ideas.

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