ABSTRACT

DIAS is an asynchronous discussion forum software, mainly developed in order to offer extended monitoring and interaction analysis support, by providing a wide range of indicators jointly used in various situations, to all discussion fora users (individual students, groups, moderators/teachers or even researchers/observers), appropriate for their various roles in different activities. In this paper we focus on the explanatory and interpretation issues that arise when the integrated interaction analysis (IA) features are used by a teacher – moderator. Core objective of this paper is to outline the importance of appropriate interpretation of the IA indicators. The notion of interpretative schemas is deployed and their potential exploitation is thoroughly explored, using examples from real teaching settings. In fact, the significance of interpreting visualization data in a combined way and from different perspectives is designated, leading to the conclusion that this issue needs to be further researched.

Keywords: asynchronous discussion, collaborative learning; computer-based education; computer mediated communication; CSCW; distance learning; online teaching

INTRODUCTION

Computer mediated communication (CMC) tools, allowing communication among users by means of networked computers for the purpose of discussing topics of mutual interest, are actually used in educational, working or everyday life contexts. In particular, asynchronous discussion fora are nowadays widely used in formal or informal educational contexts and apply principles of constructivism as well as emphasize social interaction during learning activities (Collins & Berge, 2001; Corich, Kinshuk, & Hunt, 2004; Gunawardena, Lowe, & Anderson, 1997). Recently, research focuses on finding methods for the evolvement and support of critical thinking through interactions that take place within asynchronous discussions, in order to achieve high quality learn-
ing (Stahl, 2006). Such a goal requires tools, frameworks, and methods for the facilitation of monitoring, and/or self-reflection and, therefore, self-regulation that could be supported by the automated analysis of the complex interactions that occur.

Our approach tries to meet these goals by applying computer based Interaction Analysis (IA) techniques, taking into account quantitative data. IA is an emerging field of research, focusing on analyzing interactions among users, borrowing elements from the Computer Supported Cooperative Work (CSCW), Computer Supported Collaborative Learning (CSCL), and AI (Artificial Intelligence) research fields (Dimitracopoulou & Bruillard, in press). We have developed a discussion forum platform with integrated IA tools called DIAS (Discussion Interaction Analysis System). Our aim is to support all users (moderators, learners, researchers, etc.) and facilitate discussion learning activities (Bratitsis & Dimitracopoulou, 2005, 2006a, 2006b, 2007a), by implementing a wide range of IA indicators. Our system was built mainly for use within a learning context but can also be used for other purposes, such as open-audience discussions, fora within corporative networks, scientific networks, etc. (mainly in the CSCW spectrum).

In the current article, a general overview of our approach and the interpretation issues that arise is presented, focusing on the teacher’s perspective. Since a teacher, using asynchronous discussions as a learning activity, operates as a moderator too, the terms teacher and moderator will be used as synonyms henceforth. The rest of the article is structured as follows: the theoretical background of the research is deployed in the second section, where analysis approaches in order to measure quality aspects of asynchronous discussions are examined. The importance of intense interaction among the discussions’ participants, as a prerequisite for the development of Critical Thinking and Knowledge Construction, at extension, is highlighted. The significance of the moderating tasks along with the emerging difficulties is cited underlining the necessity for the construction of corresponding supporting tools. In the third section, an overview of the existing Forum Type software, implementing supporting tools, is presented along with emerging drawbacks. The DIAS system and the integrated supporting tools, in the form of IA indicators, are described in the fourth section. The Interpretation issue is thoroughly addressed, by providing an example of an Interpretative Schema, while trying to demonstrate how the analysis point of view may differentiate the conclusions deriving from the system’s diagrams. In the fifth section, the implemented research studies are described and the emerging results are presented in the sixth section and further discussed in the last section, along with future work issues.

THEORETICAL BACKGROUND

Critical thinking is a process that allows learners to gain new knowledge through problem solving and collaboration. It focuses more on the process of learning than on attaining information, involving discovering how to analyze, synthesize, judge and create-apply new knowledge to real-world situations (Walker, 2005). While implementing discourse activities by means of asynchronous discussion fora, higher levels of interaction are needed to encourage learners to think critically. Since Mason described her model of qualitative discussion analysis and the five dimensions introduced by Henri (1992) up to the approach of Gunawardena et al. (1997) and the Community of Inquiry model developed by Garisson et al. (2001), the importance of the interactions of a person within a community is underlined, in order to achieve critical, high order thinking along with internal reflection. As pointed out by Dillenbourg (1999), it is necessary for the learner to externalize his/her thoughts and ideas in order to achieve proper reflection, thus promoting writing messages as discussion fora to an ideal reflective process. Literature points out that intensive discussion and social interaction may lead to multiple knowledge construction phases (Schellens & Valcke, 2005).

Several categories have been proposed for differentiating approaches, addressed to