POLARIS: a Building Block for Blackboard to Support Collaborative Learning

Gaby Lutgens, André Koehorst and Frans Ronteltap

Learning Lab, Universiteit Maastricht

INTRODUCTION

The Maastricht University (UM) has a leading role in the development of and research on Problem Based Learning (PBL), both nationally as well as internationally. Within this educational context students work in small learning teams (tutorial groups of about 12 students), acquiring, communicating, and integrating information in a process that resembles that of (scientific) inquiry. In practice, instead of attending weekly class lectures, students attend tutorial group meetings twice a week, monitored by a staff member (the tutor) who guides the group process. Within these groups, students are presented case-studies to solve over a period of six to eight weeks. The university works continuously to maintain its prominent and leading position in the field of educational renewal. One way to put this into practice is to uphold a system of thorough quality control. Within this framework a survey study was performed which gave insight in how students and staff evaluated this small-team learning.

Outcomes stated that one was really enthusiastic about attending small group sessions (as usual at the UM with mainly problem based curricula) and to take one's own responsibility to actively participate, both during meetings as in between the meetings when students spend time searching and studying information individually to add new perspectives. On the other hand, students stated they missed feedback on their information search activities. They seemed to lack the skill to find, search and evaluate literature to solve the problems. The survey also revealed that students did find it very fruitful to exchange ideas and bring together perspectives on a topic, but thought the time during the meetings was too short to go into depth. In other words, they missed the opportunity to (sufficiently) interact with each other (Ronteltap & Eurelings, 1996, 2002). This, while interactions in a group and the exchange of information are thought to be the basis of individual knowledge: knowledge develops through social interaction. Dillenbourg (1999) states that students do not learn from each other merely by solving the same problem at the same time, but because they interact (e.g. by explaining something or by negotiating about several solutions). Baker (1999) adds that only constructive interaction can lead to learning: interaction leading to (co)construction of understanding, insight, solutions and sometimes even (new) knowledge. When students participate in mutual discussions, make comparisons of each other's work and give their comments, search (individually) for information on the web and subsequently distribute the retrieved information in the group, and, when necessary, negotiate on the solutions to questions or tasks, this will, according to a lot of studies, lead to the (collaboratively) building of knowledge (Collins & Stevens, 1983, Scardamalia & Bereiter, 1996, Oxford, 1997, Norman, 1998).

For this reason the UM started with pilot studies to support the interaction and learning processes within the tutorial groups by implementing ICT-tools. At first (in the mid nineties) one experimented with threaded discussions. Results were promising, but the functionality proved to be very limited. Very soon students and tutors lost overview on the discussion, one was not able to link contributions or reuse (parts of) documents. Subsequently the focus has been put on the development and evaluation of POLARIS, a tool specifically designed to support specific activities (a.o. writing, co-editing, reacting) that are needed for collaborative learning.
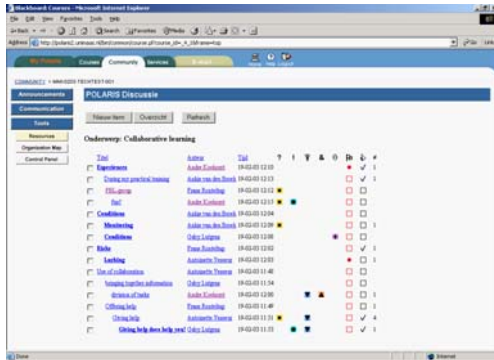
POLARIS

POLARIS is an environment in which a group creates a knowledge base, to which everyone has access for use in the study according to their own insights. A simple interface has been created to support this process. POLARIS contains explicit functionality that is aimed at the recycled use of knowledge by offering both a group environment and a personal study environment. Activities and content of the group and personal environment can be integrated.

POLARIS also provides a wide range of services for simple navigation and orientation. Important aids for the selection of documents are a graphical identification of the content character of the interaction (question and answer, discussion, and supplement), the possibility of personal marking in the group environment and an

approval function, providing a clear identification of the documents that have a central function in collaborative knowledge building.

The possibilities that are provided to the user -to restructure the content of the knowledge base according to their own insights, and the possibilities to share the results of these activities with other members of the group- make POLARIS a strong instrument in collaborative learning. The possibility for the generation of new knowledge on the basis of existing knowledge, in individual documents or with the aid of selections from documents, reduces the risk of halting the interactions in the group environment (Ronteltap, 2002). In order to facilitate collaborative learning, POLARIS has advanced functionality for reifying, reusing and managing knowledge and for orientation on the (changing) knowledge base. Distinguishing features of POLARIS are:

> Orientation and navigation
> Personalization of shared knowledge
> Convergence
> Knowledge building
> Knowledge management
> Reuse of knowledge
> Restructuring knowledge
> Manipulation of knowledge base

POLARIS has been integrated in the course management system that has been implemented university wide. The tool can be used by all tutorial groups. Focus of the Learning Lab is to help faculties to make use of the educational opportunities that POLARIS offers them and their students. Evaluation studies will be performed to provide input for the innovation of learning models and conceptions of learning and teaching. During the poster presentation the audience can take a look at the tool and try and discuss its functionality and place within the educational context of collaborative learning.

REFERENCES

Baker, M.J. (1999). Argumentation and Constructive Interaction. In G. Rijlaarsdam & E. Espéret (Series Eds.) & Pierre Coirier and Jerry Andriessen (Vol. Eds.) Studies in Writing: Vol. 5. Foundations of Argumentative Text Processing , 179 – 202. Amsterdam: University of Amsterdam Press.

Dillenbourg, P. (1999). Introduction: What do you mean by 'collaborative learning'? In P. Dillenbourg (Ed.), Collaborative learning: cognitive and computational approaches (pp 1-19).

Collins, A. & Stevens, A.L. (1983). A cognitive theory of inquiry teaching. In C.M. Reigeluth (Ed.), Instructional-design theories and models: an overview of their current status. Hillsdale New Jersey: Lawrence Erlbaum.

Norman, K.L. (1998). Collaborative interactions in support of learning: models, metaphors, and management. In R. Hazemi (Ed.), The Digital University: Reinventing the Academy.

Oxford (1997). Cooperative learning, collaborative learning, and interaction: three communicative strands in the language classroom. Modern Language Journal, 81(4), 443-456.

Ronteltap, C.F.M. & Eurelings, A.M.C. (1996). User requirements analysis of POLARIS. Maastricht: University of Maastricht.

Ronteltap, C.F.M. & Eurelings, A.M.C. (2002). Activity and interaction of students in an electronic learning environment for problem based learning. Distance Education, Vol. 23 (1), 11-22.

Ronteltap, C.F.M. (2002). POLARIS: a tool for the support of interactions in learning communities. Paper presented at the Networked learning conference 2002, Sheffield.

Scardamalia, M. & Bereiter, C. (1996). Computer support for knowledge building communities. In T. Koschmann (Ed.), CSCL: Theory and practice of an emerging paradigm, 249-268. Mahwah, NJ: Lawrence Erlbaum Associates.