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Reflections on Learning Sciences Using the Knowledge Mining Process

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Abstract: This poster synthesizes topics and issues shared by participants of the 1998 International Conference of the Learning Sciences (ICLS) using an experimental approach to community knowledge acquisition called the Knowledge Mining process (KMP). ICLS conference participants were asked to respond to two questions about the conference and the field of learning sciences. This paper gives an overview of KMP and how it can be used in various situations such as brainstorming ideas, sharing ideas prior to class, or gathering insights from experts in a given field. The second part of the paper provides a synopsis of the issues ICLS participants raised in their comments ranging from school reform to how we conduct our research.

Keywords: learning communities, reflection, distributed learning environments

Introduction

This poster synthesizes topics and issues shared by participants of the 1998 International Conference of the Learning Sciences (ICLS) using an experimental approach to community knowledge acquisition called the Knowledge Mining process (KMP) (see http://canvas.ltc.vanderbilt.edu/kmine/). KMP is a web-based tool that elicits and organizes specific information from members of a community. Briefly, KMP invites members of a particular community to provide their insights about a specific topic into a web-based form. Only after they submit their response can they see the responses of the other participants. This “blind submission” process ensures that the contributors generate their own thoughts on the topic, rather than react to others. As they read responses from others, they can, at any time, edit their initial response. After a specific deadline, the organizers of a KMP combine all comments into a new document, then invite the contributors to review and comment on this synthesized version of their original comments. These cycles of refinement continue as necessary. The desired result is to produce a refined document of the most current thoughts and ideas a community identify as relevant to a specific topic. In many ways this resembles a moderated discussion, but there are several important distinctions: KMP is designed to manage the volume of text to a single collection of ideas organized by participants' names, rather than a long sequence of messages. Also, to reduce complexity, each KMP focuses on a single question, topic or artifact (e.g. article, event, software etc).Finally, a discussion can reach closure quickly by enforcing a deadline for submission. The mechanism for refinement is through multiple cycles of comments by the participants and synthesis of these comments.

We have used the process in multiple settings including gathering insights from experts in a domain, brainstorming potential ideas for a project, and having students share their reflections on articles prior to attending class. In the context of this project, KMP provides a mechanism to survey participants’ thoughts and reactions to the ICLS Conference.

Reflections on the 1998 ICLS Conference

The ICLS 1998 in Atlanta included participants from around the world presenting a wide range of research relative to learning and instruction. (See http://www.cc.gatech.edu/conferences/icls98/ for more information.) Attending every session was impossible; however, many reported that the size of the conference resulted in an intimate atmosphere that encouraged a high degree of interaction between the participants. We used KMP to extend this exchange beyond the temporal confines of the conference. Over 200 participants of the ICLS in Atlanta were asked to comment in the KMP web site on two questions. First, “What are at least two dominant themes that emerged for you at the conference? “ Second, "What issues do you think the field of Learning Science (LS) needs to focus on?" In the initial cycle of KMP, 35 participants registered and 23 contributors sent in interesting detailed comments.

For purposes of this paper we present several of the more interesting themes raised by the contributors in the first knowledge mine cycle including 1) managing initiatives for systemic reform and 2) sharing ideas across disciplines and accumulating information shared by this community. In this paper we attempt to objectively synthesize the major themes and issues the participants shared in the Knowledge Mine area on the web. This does not provide a critical report of the conference, or a critical analysis of the field of Learning Science. However, the responses shared by the participants do provide some provocative insights into what people find important and illustrate some tensions we need to consider as a field.

One of the most stimulating sessions was a panel of experts that include Roger Shank, Elliot Soloway, Andee Rubin and Alan Kay. This session, called "Our Favorite Curmudgeons Critique the Conference", sparked interesting commentary on how to initiate school reform. Schank's approach is to start anew, outside the current system, with exemplary programs that demonstrate the possibilities. Soloway argues that the only practical approach we have is to work within the existing system to institute change. Several people highlight the fact that many of the current centers (e.g. LeTUS, LTC, CILT and CIRCLE) are trying to combine both approaches. These centers are working hard to create innovations for the classroom and educating administrators and policy makers to understand what needs to be done to help sustain and propagate these innovations. They have created demonstration projects in classrooms and school districts to show what can be done, and describe methods for others to implement it in their local situations.

On a related note, many participants expressed concern about the lack of diversity of players involved in the process of designing curricular material. Several were encouraged by the involvement of industry representatives interested in educational issues (e.g., Los Alamos Labs). Others felt there needed to be a larger involvement of people outside the research community, for example, the session including the teachers' perspective on designing classroom environments. Others wanted textbook publishers and policy representatives involved in the conference. Also, many are concerned that there is a "lack of incorporation of sciences other than information sciences in the research presented at this conference. Where are the neuroscientists, the cognitive scientists, bioengineering folk, philosophers and logicians, etc....Such broadening of scope could allow a synthesis of themes from several disciplines". This relates to others expressing a concern that technology pervades most conversations. No one discouraged the use of technology, but mentioned that we need to scrutinize when and how it is applied. Also, as Andee Rubin pointed out, we need to understand that technology can take many forms other than the box on the desktop connected to the Internet. It is up to our creative abilities to create positive learning environments based on the principles of how people learn.

Another dominant theme raised was the lack of systematic research and assessment methods used in the research presented at the conference. Many people mentioned Nora Sabelli's point about NSF wanting measurable outcomes from our reports. As one person mentioned, we need to move beyond the demonstration of new technologies and focus more on issues of how people learn and methods we can use to establish effective learning environments.

Discussion

The range of issues raised in KMP present some challenges the field faces in defining itself as leaders in both research and participants in systemic reform of our educational system. It is possible that this tension could be resolved by creating more opportunities for others in the educational systems to work with the LS community. This "Reflection on ICLS 98" provides a survey of people's reactions to what they saw and heard, and what they value. KMP offers a mechanism for us to share, synthesize and reflect on our ideas. This method for accumulating and synthesizing knowledge can provide a central forum for any group to efficiently build their understanding of a domain. Several people commented that they value a mechanism to reflect on the conference and defining goals for the field. Therefore, we plan to repeat the process after ICLS 2000.

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