Metaskills of Collaborative Inquiry in Higher Education

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Abstract: Even if learners' expertise is bound to a specific field of inquiry, there are generalizable skills and competencies that provide intellectual resources for managing new problem-solving situations. Higher-level skills that emerge through sustained efforts of advancing knowledge may be called *metaskills*, their development being an appropriate long-term goal for higher education. Considering these goals, the individual, collective and knowledge-creation aspects of regulation of inquiry were examined within a university course.

Collective aspects of regulation of learning

There is proposed shift to extend the cognitive (individualistic) and social (participatory) approaches on learning towards the inclusion of a knowledge-creation approach (Hakkarainen, Palonen, Paavola, & Lehtinen, 2004). The knowledge-creation approach addresses the question how people develop new artefacts and products or ways of working collaboratively over longer periods. Importantly, it concentrates on the interaction through these common objects (or artefacts) of activity, not just between people, or within individual minds.

The term metaskills is used to describe metalevel monitoring and regulation of academic inquiry. For Hakkarainen et al. (2004) it refers to higher-level skills that emerge through sustained efforts of advancing knowledge. A way to facilitate the knowledge creation process is to provide a learning community a heuristic model for engagement in inquiry, as in the model of progressive inquiry (Muukkonen, Lakkala, & Hakkarainen, 2005).

The present research explores collaborative inquiry in university education by examining the collective aspects of regulation of learning, which are conceived to involve the exercise of metaskills. Prior research on metacognition takes into consideration the individual actor's metalevel processes or working with a peer, but not the collective metalevel work toward and through shared knowledge objects. Thus, the units of analysis of personal epistemology and metacognition have remained firmly located in the individuals' processes. In recent research on social metacognition, the skills required in interactions with peers have been proposed as a distinct dimension of metacognition and co-regulation of learning (Jost, Kruglanski, & Nelson, 1998; Salomon & Perkins, 1998; Salonen, Vauras, & Efklides, 2005). There is a need for a more contextualized examination of metacognitive processes (Hofer, 2004). Thus we seek to expand from individual or peer regulation of learning towards a collective artifact-mediated and contextualized process, where participants monitor and co-regulate the collective process and the advancement of objects of inquiry besides exercising individual self-regulation.

Methods and results

A course was designed to engage undergraduate students in inquiry practices for eleven weeks, following the progressive inquiry framework. During face-to-face meetings, three tutors used systematic methods to facilitate development of the group's research questions and plans for a collective final report. We carried out a content analysis of the database discourse within the Future Learning Environment (FLE3; http://fle3.uiah.fi/) and of students' self-reflections provided at the end of the course.

To examine regulation of collaborative inquiry, we employed a framework that consisted of three encompassing levels: (1) monitoring and regulating individual process, (2) monitoring and regulating collective process, and (3) monitoring and regulating efforts in knowledge building (Scardamalia, 2002) and advancement of shared objects. We devoted the least attention to individual monitoring since it has been extensively investigated. The second level, the social interaction level, is addressed by group dynamics research or process management studies within learning communities. The third level, we hypothesized, would presuppose individuals' exercising self-regulatory skills, and require their commitment to work on shared objects and intentionally build on each other's ideas.

An analysis of the database discourse suggested that students' were aiming at question-driven inquiry. However, differences were found on how the collaboration succeeded in advancing collective understanding and knowledge-creation versus simply joining separate participants' work under a common heading in the final report. One of the three groups, distinctively, had lengthy exchanges about how they should proceed both in content and process. Further, in this group each member at least once rewrote their report instead of merely providing a section, which we consider evidence for a particular emphasis on a shared object of inquiry.

For the self-reflections, categories emerged which differentiated between individual and collective commitment, as well as between individual and collective knowledge building. To illustrate the two latter categories, a student reflecting on her own effort wrote, "At first there was a high threshold for me to start writing my thoughts on the computer, because I had the feeling that my thoughts were not in a ready form". In contrast, a student reflecting on the collective knowledge building wrote, "In the final stages, we experienced moments that we discussed the topic of our work with new concepts and were throwing ideas in the air. We explained unclear points to each other. I feel I learned a great deal from the other students in my group."

In sum, only a subset of students gave particular emphasis to collective knowledge building, and those who succeeded in such collective advancement had, in their self-reflections, also devoted most reflection to the collective process. The data provided evidence for that the students most advanced in their studies, had, on average, addressed more often challenges of collective commitment and engagement in collective knowledge building. The students less successful in collective knowledge building were, however, active in explaining how --through their participation or receiving appropriate guidance-- their collective inquiry could have made more progress, suggesting that they were considering the challenges of novel inquiry practices introduced by the course.

Conclusions

As the course setting involved three tutors, it is not an example of an average setting for higher education. However, the three levels for modeling metaskills helped to explicate qualitative differences in the three student groups' collective processes and students' self-reflections. Engaging in truly collective inquiry --i.e., using collective metaskills-- was a process only partially achieved in the groups. Such inquiry, however, may simply be too challenging an endeavor for such a tight timeframe with unfamiliar people. In boarder terms the course did, nevertheless, expose participants to practices of developing artefacts collaboratively, which provided an educational experience on knowledge creation practices.

To conclude, metaskills of collaborative inquiry are proposed to address commitment to collective, artifact-mediated, and prolonged inquiry efforts, which are not reducible to individual productions. However, understanding the characteristics of collective object-oriented inquiry and translating them to pedagogical practices call for further theoretical and empirical research activities.

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