Knowledge building for teacher education and professional development: The opportunity and challenges of innovation

Introduction

Innovation in teacher education may be the result of advances at the theoretical level, the design of new tools, pressure from a governmental agency, or genuine effort to improve practice. Moving beyond best practice is the thrust of the symposium that we suggest, one that is reflective of how teacher educators can take advantage of theoretical advances supported by new digital tools to better the learning environment that they create for and with student teachers.

We ground our practice (teaching and research) in design experiments (Brown, 1992; Collins, 1992, 1999) conducted in school settings, and which combined knowledge and technology in innovative ways a decade ago (Bruer, 1993; Bereiter and Scardamalia, 1993; McGillis, 1994). More recent related research works are also considered, including DiSessa and Minstrell (1998), Bransford, Brown, and Cocking (1999), Blumenfeld, Fishman, Krajcik, and Marx (2000), Bereiter (2002), and Scardamalia and Bereiter (2003).

In best instances, pre-service teacher education programs introduce student teachers to advances in the learning sciences by demonstrating coherence between theory and practice in the teacher educator’s classroom or during field placement. Coherence is important for creating an environment capable of providing powerful learning experiences to student teachers, ones likely to transform their beliefs about learning and teaching (Wideen, Mayer-Smith, and Moon, 1998). Bereiter and Scardamalia (2003) made an important breakthrough regarding teacher education and professional development with the following distinction between belief and design modes: “Critical questions for work in belief mode are “Is it true?” and “What is the evidence?” Critical questions in design mode concern what an idea is good for and how it could be improved.” They go on to point that “Formal education is conducted almost exclusively in belief mode, whereas design mode characterizes knowledge work in the outside world.” (p. 3)

For years, the authors of this proposal have seized the opportunity provided by digital tools to enhance the learning environment of student teachers and school learners on and off campus (Brett, 2004; Laferrière, 2000; Lamon, Secules, Petrosino, Hackett, Bransford, and Goldman, 1996). They share the idea that technology use ought to trigger accommodation rather than assimilation (see Seidel and Perez, 1994). They take into account the fact that constructivist teachers are more inclined to use the Internet in their classrooms (Becker and Riel,1999). They focus on online discourse, but are well aware of the limits identified by Blanton, Moorman, and Trathen (1998). And they see shortcomings in communities of practice, on-site and on-line, whose members are not intentionally targeting the transformation of their own practice (Lave and Wenger, 1991) for the knowledge age.

Knowledge building, supported by the Knowledge Forum suite of tools, is put forward in this symposium on teacher education and professional development. Knowledge building occurs when advances are made in the discourse of a community. Knowledge building may be defined as “the production and continual improvement of ideas of value to a community, through means that increase the likelihood that what the community accomplishes will be greater than the sum of individual contributions and part of broader cultural efforts.” The following principles apply: Real Ideas, Authentic Problems; Improvable Ideas; Idea Diversity; Rise Above; Epistemic Agency; Community Knowledge, Collective Responsibility;

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Student teachers' virtual practica in knowledge building classrooms, pre-service and teacher online discourse in knowledge building classrooms, and knowledge building in teacher educators' classrooms are the four objects of inquiry. The following papers will demonstrate the opportunity and the challenges of innovation, and they are:

- **The knowledge-building oriented virtual practicum**, Stephane Allaire, Laval University, Canada (Short paper, First paper, First-hour presentation)

  When preparing to do their student teaching in a knowledge building classroom (the innovative setting), student teachers must understand enough in advance of and during their time in such classrooms for their learning and for school learners to benefit. The “solution” put forward was to design virtual tours that show examples of these onsite and online environments (knowledge bases/databases) created by classroom- and course-based knowledge building communities. Campus-based and school based teacher educators used virtual tours to create virtual practica aiming at preparing student teachers to be functional in knowledge building classrooms (junior- and high-schools). Four cases will be presented. It is their connection to innovative but real classroom experience that distinguish a knowledge-building orientation from other forms of virtual practica. We suggest that such a connection can be established in a number of other fields that could take advantage of a better integration of theory and practice for professional development.

- **From Monologues to Dialogues: Exploring On-line Discourse in Knowledge Building Classroom Environments**, Mary Lamon, IKIT, OISE/UT, Canada (Full paper, Second Paper, First-hour presentation)

  This paper presents results of a study of teachers who used an online knowledge building environment, Knowledge Forum®, to help create knowledge-building communities (Scardamalia, 2000) in their classrooms. In-depth interviews were conducted with teacher participants who were experienced knowledge building teachers to understand their online patterns of discourse with their students. Using a grounded theory methodology (Glaser and Strauss, 1967) five major themes emerged related to how online discourse in a knowledge building community changed their discourse from traditional IRE interactions characteristic of face to face classroom discourse (Cazden, 1988) to a role in which they observed students’ work for formative assessments, they democratized knowledge by highlighting students’ knowledge advances and problems of understanding in the database, leading to changes in their classroom environments where students increasingly took more responsibility for their own learning. The results suggest that Knowledge Forum can serve as a catalyst for changing teacher practices from constructivist approaches to learning to a knowledge building approach where working with ideas is central.

- **Scaffolding student teachers online discourse for knowledge building purposes**, Therese Laferriere, Laval University, Canada (Full paper, Third Paper, First-hour presentation)

  This paper focuses on pre-service teachers' use of the knowledge building principles when transformed into scaffolds to support and orient online discourse. Student teachers' inquiry was on teaching in a network-enabled classroom. The use of the scaffolds was tracked over a three-year period, and analyzed in both quantitative and qualitative ways. Results reveal that student teachers developed a proper
understanding of the scaffolds, as measured by the level of adequacy obtained through a detailed analysis of their individual online activity and external appreciation (two judges). Their level of advancement in the program had little to do with the quality of use of the scaffolds, but student teachers with previous experience of use of the scaffolds demonstrated autonomy, as measured by lesser use of the scaffolds. Implications are drawn with regard to the knowledge building community's progressive discourse.

- **Developing Deeper Understanding through Online Discourse in In-service Teacher Education**, Nobuko Fujita, OISE/UT, Canada (Full paper, Fourth Paper, Second-hour presentation)

  A major challenge in online graduate education contexts is to create communities of inquiry characterized by critical discourse. Progressive discourse is a kind of critical discourse that deepens over time and is committed to idea improvement (Bereiter, 2002). In-service teachers, however, find such discourse difficult. The reasons for this include the greater risk of being misinterpreted in text-based, asynchronous online discussion, and the fact that teachers' discursive interactions in general shows a lack of direct advice or criticism (Kling & Courtright, 2003). Guidelines to help students manage group discourse, problem finding, and problem solving in online discourse were provided, and students were asked to make their learning goals public and to try using scaffold supports. Some emergent recommendations include the usefulness of a) an educational intervention identifying clear guidelines for managing group discourse; b) having students publicly state their learning goals to highlight shared values among themselves and the instructor; and c) using scaffold supports in Knowledge Forum to focus students' reading and writing.

- **Faculty experiences of introducing knowledge building pedagogy and technology in preservice teacher education**, Clare Brett, OISE/UT, Canada (Full Paper, Fifth Paper, Second-hour presentation)

  This qualitative case study involved open-ended interviews conducted on audio-taped, transcribed, and analyzed for patterns in best practice among preservice faculty and instructors at OISE/UT who teach in one-year elementary and secondary education using mixed-mode, face-to-face courses using Knowledge Forum® online discourse databases. These online databases allow students to discuss key course concepts, collaborate on group assignments, and present portfolios of their professional development. Challenges faced by faculty in implementing this technology centred on the limitations of using the knowledge building approach in only parts of the preservice program. Difficulties included coordinating consistent constructivist pedagogy with other faculty in the preservice program, some of whom adhered to more traditional transmission models of learning and teaching, and dealing with the theory/practice divide that students experience in the field on their practicum. This was exacerbated by the brevity of the program. Significance for the field of information technology and teacher education

Knowledge, innovation, and technology combine in more complex ways than ever before. Policy makers that put innovation at the forefront of the development strategy of their country (United States, Australia, Norway, Canada, and others) for entering the knowledge age always seem to include teacher education as part of capacity building (Breuleux, Laterrière, and Lamon, 2002). We suggest that one more step be taken for bridging societal aspirations and teacher education at this current time, that of including knowledge building for moving beyond best practice when it comes to the use of information and communication technologies. Inspired by the work of Bereiter and Scardamalia (1994), we have explored the
opportunity and the challenges of transforming classrooms into knowledge building communities, and we feel more than ready to share the lessons learned with SITE colleagues and the community of teacher educators at large.

Organization

We will begin by a five-minute introduction to knowledge building. The Knowledge Forum suite of tools will be uncovered as the five presentations unfold. After each presentation, there will be time for clarification questions. A discussion with participants will follow the five presentations, and an invited respondent will offer final comments.

References


Scardamalia, M. (2000). Can schools enter a knowledge society? In M. Selinger and J. Wynn (Eds.), Educational technology and the impact on teaching and learning (pp. 5-9). Abingdon, RM.


