Getting Started and Sustaining Knowledge Building

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Abstract: Knowledge Building pedagogy (Scardamalia & Bereiter, 1996) offers a Knowledge Age framework for education by supporting students' capacity for innovation. Students work in a community, building on each other's knowledge, exploring and refining each other's theories, and engaging in the progressive improvement of their ideas. This knowledge work is supported by Knowledge Forum (Scardamalia, 2004) - the online environment that provides scaffolding supports for idea development. Teachers who are eager to explore Knowledge Building pedagogy and Knowledge Forum technology in their classrooms may not know where to begin, and application of Knowledge Building principles may not be obvious. To aid their process of invention, examples of Knowledge Building principles in action should prove helpful. The goal of this session is to provide such examples, and to collectively develop effective strategies, curriculum and resources that would allow newcomers to get started with Knowledge Building.

Focus of the Session

Knowledge Building pedagogy (Scardamalia & Bereiter, 1996; 2003) offers a Knowledge Age framework for education by supporting students' capacity for innovation. Instead of simply learning about science, history, literature, etc., students engage ideas as scientists, historians, writers, and so forth. They work in a community, building on each other's knowledge, exploring and refining each other's theories, and engaging in the progressive improvement of their ideas. This knowledge work is supported by Knowledge Forum (Scardamalia, 2004) - the online environment that provides scaffolding supports for idea development, graphical means for viewing and reconstructing ideas from multiple perspectives, and a variety of other functions that contribute to collaborative knowledge building.

Teachers who are eager to explore Knowledge Building pedagogy and Knowledge Forum technology in their classrooms may not know where to begin, and application of Knowledge Building principles may not be obvious. To aid the process of invention, examples of Knowledge Building principles in action in a variety of contexts should prove helpful, as we collectively refine our understanding of education for a Knowledge Age. The goal of this session is therefore to provide examples of getting started with Knowledge Building pedagogy and technology, and also to collectively develop effective strategies, curriculum and resources to allow newcomers to get started. Questions to be addressed include: What resources do we need to help schools operate as knowledge-building communities? How can teachers build a community to support each other and innovation in education? How can researchers and teachers collaborate to promote idea generation, diversity, and sharing? What forms of interaction will support careful listening and refinement of ideas so that students engage in idea improvement with self-direction? What scaffolds will support increasingly high-level cognitive functions? These and other issues will be discussed and recommendations will be provided for enhancing and sustaining effective knowledge building discourse in school. The session will bring together researchers, teachers and school principles from Canada, Singapore, and the United States who have different, but complimentary perspectives on how to get started with Knowledge Building.

Contributors and Design Sessions

Knowledge Building in Senior Kindergarten and Grade 1 (Maria Chuy, Christian Tarchi, Monica Resendes & Bodong Chen)

If we ask a teacher who is experienced in the Knowledge Building approach "How and when do we get started with Knowledge Building?" the answer may well be "in Kindergarten." As illustration to this answer, an example of successful implementation of Knowledge Building will be provided, using the classroom observations from the Laboratory School at the Dr. Eric Jackman Institute of Child Study[1]. In this school, children are introduced to knowledge building principles when they first enter the school at the age of three. The process of playing with ideas is natural in children, and is often exhibited as soon as children learn to speak. And expression and discussion of their ideas can be vehicles to deeper knowledge and understanding; so-called "misconceptions" are better thought of as "improvable ideas" (see Zhang, Scardamalia, Lamon, Messina & Reeve, 2007) and basis for conceptual change (Vosniadou, 2008) rather than "mistakes."

As part of this session, researchers from the Institute for Knowledge Innovation and Technology[2] will trace the work of two experienced teachers in order to (i) illustrate how knowledge building discourse can be initiated as early as Senior Kindergarten, through a process of playing with ideas that is natural in children, and (ii) demonstrate how Knowledge Forum be can introduced in Grade One, when students are just starting to read and write. Key classroom activities will be described that demonstrate strategies teachers use to build effective Knowledge Forum discussions at this young age. The session will include video recordings of teachers' reflections and transcriptions of classroom discussions.

Challenges and Strategies for Effective Knowledge Building in Elementary School: Principals' Perspective (Elizabeth Morley & Richard Messina)

Teacher development is essential for successful implementation of Knowledge Building pedagogy and technology. Elizabeth Morley, principal of the Dr. Eric Jackman Institute of Child Study[1], will discuss effective procedures for introducing new teachers to Knowledge Building. She will also provide an account of the evolution of Knowledge Building practices over a decade, with indication of how core knowledge building principles such as *idea diversity* and *improvable ideas* allow for shifts that have enabled substantial knowledge advances in scientific, graphical, textual, and dialogic literacy associated with Knowledge Building practices. Strategies for engaging newcomers into an already functioning knowledge building community will also be discussed.

Richard Messina, an experienced Knowledge Building teacher and now vice-principle of the Dr. Eric Jackman Institute of Child Study[1], will reflect on challenges to be expected along the thorny but fruitful path to Knowledge Building in elementary and secondary schools. Challenges and barriers to be discussed include a questions such as: How can we shift from "correct" to "improvable" ideas, so that children focus on advancing ideas rather than avoiding expression of wrong ideas? How can we help teachers to understand *epistemic agency* principle, so that they turn over their high level executive processes to students?

Designing a Knowledge Building Curriculum (Katerine Bielaczyc & Teachers from Townsville Primary School, Singapore, TBA)

In order to have students going beyond learning *about* science to learning *how to engage as scientists*, a new school curriculum is needed. Through her project, entitled "Spreading Ideas: Creating Point-at-able Models of 21st Century education"[3], Katerine Bielaczyc will address this question and reflect on the ways to cultivate a knowledge-building community in a classroom. The session will include onsite participation of teachers from Townsville Primary School (Singapore) who are creating a new science curriculum and Knowledge Building models in Singapore. This curriculum would enable students to go beyond limits of their knowledge and function in a manner similar to the scientific community.

This session will be extended into a broader discussion around curriculum of international open courses with emphasis on knowledge creation. Toward this end participants of the session will be positioned to identify environments and technologies that foster knowledge creation, and to discuss theories, pedagogies, and technologies that advance that goal.

Knowledge Building International: Open International Courses, Innovation, and Resources (Marlene Scardamalia, Carl Bereiter, Monica Resendes & Stian Håklev)

The movement toward open innovation and resources has the potential to democratize educational innovation, but to accomplish that it must extend beyond resources for individual learners and teachers to a coherent system of interaction and feedback to support knowledge-building communities. Today's best practices won't be tomorrow's; effective team action will enhance and surpass individual achievements. Thus, cultivating a liking for advancing the community enterprise and increasing the pace of innovation while reducing barriers to change

is essential. Quality assurance requires new assessment and feedback tools in the hands of users, and it calls for international courses to engage teams of teachers, researchers and engineers in a collaborative process of invention, evaluation, and refinement. We provide a brief overview of proposed open and free resources to be offered through a new association: Knowledge Building International. During the session we will provide a brief overview and handout. We will then address your issues and questions during the discussion.

Discussion (Jianwei Zhang)

As Discussant, Jianwei Zhang will synthesize the outcomes of the session, discuss the *principle versus procedure* dichotomy in educational approaches, and more generally reflect on the potential of Knowledge Building pedagogy and Knowledge Forum technology for education in a Knowledge Age.

Endnotes

(1) Official website of the laboratory school at the Dr. Eric Jackman Institute of Child Study, OISE/University of Toronto, Canada: http://www.oise.utoronto.ca/ics/

(2) Official website of the Institute for Knowledge Innovation and Technology, OISE/University of Toronto, Canada: http://www.ikit.org/

(3) Official website of the "Spreading Ideas: Creating Point-at-able Models of 21st Century education" project, Learning Sciences Lab, Nanyang Technological University, Singapore: http://lsl.nie.edu.sg/projects/spreading-ideas-creating-point-at-able-models-of-21st-century-education

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