Preparing for Future Learning By Knowledge Co-Creation and Collaboration

Dr Wenli Chen
National Institute of Education, Nanyang Technological University Singapore
Email: wenli.chen@nie.edu.sg

EXTENDED ABSTRACT

New technologies, work patterns, and practices are disrupting how we *learn*, where we *learn*, and what we need to *learn*. Young people have become increasingly reliant on ICT to create, connect, collaborate and learn. Educational researchers and practitioners have long been advocating equipping students with collaborative learning skills. In collaborative learning environment, students take on roles, brainstorm, contribute ideas, critique each other's work, and together solve aspects of larger problems, all to good effect. ICT brings new opportunities for idea generation and collaboration. Computer-supported collaborative learning has been adopted pervasively in Singapore K-12 education. The ICT tools help visualize students' ideas and present their ideas to each other through the collaborative network. By participating in the online knowledge co-creation and collaboration activities, students not only learn the content knowledge deeper but also develop the 21st competencies as a knowledge co-creator. In this speech Dr Chen Wenli will share her 2 research projects on designing and implementing of ICT-supported knowledge co-creation and collaboration in Singapore primary and Secondary Schools.

Chen et al (Chen, Looi, & Tan, 2010; Chen & Looi, 2011; Looi, Chen, & Patton, 2010; Looi, So, Toh, & Chen, 2011; Wen, Looi, & Chen, 2012) developed the technology GroupScribbels to support students' rapid collaborative knowledge improvement (RCKI). The notion of rapid collaborative knowledge improvement (RCKI) refers to democratizing participation and idea refinement in the context of live dynamic classroom settings, that is, face-to-face collaborative knowledge construction and improvement over the duration of a class session, and supported by certain technologies for lightweight instant interaction. When enacted in the classroom, RCKI takes the form of alternative ways to promote classroom interactions that enable students to co-construct knowledge and learn content skills. It is designed to address the constraints faced by classroom teachers when they are designing and implementing knowledge construction and improvement practices within the short duration of a classroom lesson ranging from say half an hour to one and a half hours. The notion of "rapid" is understood from three main aspects of a learning activity: 1) it is done within a limited time of participation; 2) it uses a lightweight form of expression; 3) it must enable the participants to have quick cycles of interaction. RCKI focuses on democratic knowledge sharing as well as cycles of individual and group knowledge enhancement.

Group Scribbles (GS) was designed to support RCKI by harnessing the collective intelligence inherent in the classroom. GS was co-developed by National Institute of Education Singapore and SRI International. It enables collaborative generation, collection and aggregation of ideas through a shared space based upon individual effort and social sharing of notes in graphical and textual form (SRI International, 2006; Chen et al, 2010).
All GS lessons were co-developed by researchers and teachers. To guide teachers design effective RCKI lesson, design principles were proposed. A funnel model was created to facilitate GS-based RCKI activities. The model advocates a 3-phase collaborative activity: "Contribute diversity of ideas", "Pool collective wisdom", "Seek greater perfection".

Over 5 years, the NIE researchers worked with 3 schools intensively to design and implement a series of GS-based activities across different learning subjects including Science, Mathematics and language

learning. About 300 RCKI lessons were designed and implemented. 15 teachers and 17 classes of students have been involved in the project. 15 professional development sessions were held with the teachers and 2 workshops on RCKI were conducted to share the research and pedagogies to other schools.

The results show that the GS classes performed better than non-GS classes as measured by traditional assessments (Looi, Chen, & Ng, 2010). With GS, students were found to have more opportunities to participate in class discussions through both GS postings and verbal interactions, and were exposed to diverse ideas (Chen, Looi & Tan, 2010; Looi & Chen, 2010). Analysis of data collected in the classroom as well as data on students' attitudes and perceptions indicate that GS facilitated students' collaborative learning, and improved students' epistemology and attitudes toward science learning (Looi, Chen, & Ng, 2010). This project was cited USA's National Educational Technology Plan 2010 as an example of effective ICT integration in schools.

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