

## **Research Summary**

**Title:** From Activity-based to Principle-based Approach: A Case Example of Knowledge Creation for Low-achieving Students

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### **Statement of the issue/problem:**

Paradigms of learning have been shifting from individual to social, and from knowledge reception to knowledge creation. Teachers, too, have to change their mindset and practices in order to meet the new challenges of reform. Although many professional development programs for teachers in Hong Kong have been focusing on improving teaching practice, teacher learning should go beyond the acquisition of know-how and the acculturation of good practice (Chan, et al., 2007) and development should be designed for principle based understanding (Scardamalia & Bereiter, 2006).

This case study aims to investigate a teacher's growth trajectory and explore how he changes from activity-based to principle-based approach in classrooms for low-achieving students in the context of a teacher community for the understanding of knowledge building. The research questions are:

- (1) How does the teacher change from activity-based to principle-based approach in knowledge creation classrooms in Hong Kong?
- (2) What were the results for the implementation of knowledge building in classrooms for low-achieving students in Hong Kong?

### **How the study will address the problem:**

The study was carried out in the context of a knowledge-building teacher network. The teacher joined the network in 2006 and has become a seconded teacher since 2008. The study addresses the problem in three dimensions. We examined the teacher designs for knowledge building classes in 2008-2009 and 2009-2010 in order to see if there are improvements from activity-based to principle-based understanding. We also examined quantitatively students' advances in the Knowledge Forum over time by employing ATK and Applet analyses. Finally, we investigated interview data from the teacher to show changes in teaching thinking and understanding of knowledge building.

### **Findings**

#### *Teacher growth from activity-based to principle-based approach*

In Year 1, the teacher carried out a ten-step kb program focusing on various

motivating tasks and integration of activities in the curriculum. As the teacher was concerned about student level, KB was conducted after school. While there were positive aspects, it was a few students who contributed most to database – many were having difficulties.

In Year 2, the teacher began to put knowledge building principles more in the foreground in his curriculum design.

#### *Student Engagement in Knowledge Building – ATK and Applet Analyses*

ATK and Applet analyses in consecutive years showed improvements in student's participation and collaboration for inquiry over time toward more collective growth. The teacher examined the principle of improvable ideas embedded and transformative assessment – he focused on reflection at the start and showed the ATK results to his students in consecutive lessons; had students improve on agency, resulting in considerable growth of the forum within a short time. There was more democratization in Year 2 with more contribution. Reflective diary also focused more on community knowledge.

#### *From an Individual Learner to a Member of the Knowledge Building Community*

Interview results and teacher discourse also showed the gradual transformation of the teacher focusing more on epistemic aspects and moving from an individual learner to a member of the knowledge building community.

### **Contribution**

This study echoes Scardamalia & Bereiter's view on principle and supports Chan et al study illustrating the teacher with more principle-based understanding had students making more progress. Besides, it refutes the myths that many teachers believed that low-achieving students should be taught by knowledge transmission approach (Zohar, Degani, & Vaaknin, 2001).

### **References**

- Chan, C., Ma, R., & Law, N. (2007). *Teachers' Understanding of Knowledge Building in an Emerging Community*. Paper presented in Knowledge Building Summer Institute, University of Toronto, Canada.
- Scardamalia, M., & Bereiter, C. (2006). Knowledge building: Theory, pedagogy, and technology. In K. Sawyer (Ed.), *Cambridge Handbook of the Learning Sciences* (pp. 97-118). New York: Cambridge University Press.
- Zohar, A., Degani, A., & Vaaknin, E. (2001). Teachers' beliefs about low-achieving students and higher order thinking. *Teaching and Teacher Education* 17, 469-485.