

Date: Wed 4th Sep 2019
Time: 3.30 p.m. to 4.30 p.m.
Venue: Math Lab 5 (NIE7-B1-10)

Beyond Noticing Experienced Teachers' Discipline-based-STEM lessons and Students' Cognitive Flexibility: Pre-service Teachers' Reorientation of Instruction

Designing STEM lessons is challenging. First, it is critical to support pre-service teachers (PSTs) to notice the instructional design of discipline-based-STEM (D-B-STEM) lessons, which referred to focus on systemic route, subject priority, universal idea, practical depth of one discipline in STEM education. Second, it is unclear how instructional design of such STEM lessons might affect the students' cognitive flexibility (CF), the different cognitive dispositions needed to resolve complex problems. In this paper, we report our findings from a study involving a series of research workshops- six PSTs and four Experienced Teachers (ETs) -compared four-paired videos of PSTs and ETs, and the PSTs were guided to notice the elaborated instruction of an experienced teacher's D-B-STEM lesson. Comparing the two groups of teachers by the method of State Space Grids (SSGs), we found that PTs learned to apply SSGs to analyze the dynamic link between the state of D-B-STEM teaching and students' CF. On the concerning of integration of STEM, most PTs think that it was easier to manage it in structure than in content. Involving in scaffolding students' CF, PSTs highlighted the strategies including posing challenging problems combined with STEM, heuristic inquiry and deep understanding mathematics concepts, which become potential reorientation to their teaching.

Weiping Zhang has been working in Mathematics & Science College, Shanghai Normal University as an associate professor since 2007. She is interested in several fields including STEM education, pre-service teacher training and mathematics learning. She has published one book and fifteen papers in Chinese CSSCI Journals. From 2013 to this year, she has cooperated with the professors in Texas A & M University, Middle Tennessee State University, San Diego State University, as well as NIE, Nanyang Technological University in 2017 as a visiting scholar.

All are welcome!