Teaching to Learn and Learning to Teach

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In STEM education, widely accepted teaching goals include not only the development of solid content knowledge but also the development of general scientific reasoning abilities that will enable students to successfully handle open-ended real-world tasks in future careers and design their own experiments to solve scientific, engineering, and social problems. Traditionally, it is often expected that consistent and rigorous content learning will help develop students' general reasoning abilities; however, our research has shown that the content-rich style of STEM education made little impact on the development of students' scientific reasoning abilities. Therefore, how to train teachers who can help students develop both solid content knowledge and adequate scientific reasoning skills has become an important question for educators and researchers. Research has also suggested that inquiry based science instruction can promote scientific reasoning abilities and that the scientific reasoning skills of instructors can also significantly affect their ability to use inquiry methods effectively in science courses. In this talk, I will compare the features of the teacher preparation programs in China and USA and discuss the possible strength and weakness of the education systems and programs in the two countries. Understanding the different education settings and the outcome can help researchers in both countries to learn from each other's success and to avoid known problems. Examples of current research that may foster such knowledge development among researchers from both countries will be discussed.