Comparison of U.S. and Chinese High-School Physics Teaching and the Need for Active Learning at the College Level

Sachiko Tosa
Wright State University, Dayton, OH 45435, U.S.A.
sachiko.tosa@wright.edu

Inquiry-based teaching has been emphasized as a pillar of the science education reform in both the United States and China. It is generally agreed that inquiry-based teaching is a pedagogical approach in which students engage in their own active learning through questioning, experimenting, and developing and presenting logical explanations of the phenomena based on empirical evidence. Such an approach is expected to provide students with opportunities to develop deeper understanding of scientific concepts. However, the effectiveness of inquiry-based teaching has been questioned recently [1]; some researchers argue that for immediate problem solving, more guided instruction is needed. Under the circumstance, it would be interesting to investigate how science lessons are different and similar in an international context.

This study examines the extent to which inquiry-based teaching is practiced in US high-school physics in comparison with Chinese high-school physics. Data were collected through lesson observations and the use of a teacher survey (N=19). Observed lessons were coded using Reformed Teaching Observation Protocol (RTOP) [2]. Survey results show that both US and Chinese teachers are well aware of the importance of inquiry-based teaching. However, in practice, little inquiry-based teaching was observed in both of the countries by different reasons. US physics lessons often lacked development of students’ rigorous understanding of physics concepts through thought-provoking questions and problem solving. In contrast, many of the Chinese lessons failed to include opportunities for students to present and test their own ideas.

The findings suggest a strong need for an approach that combines rigorous content development with active learning strategies in both countries. Further implications of the findings to improve physics education at the high school and college levels will be discussed.