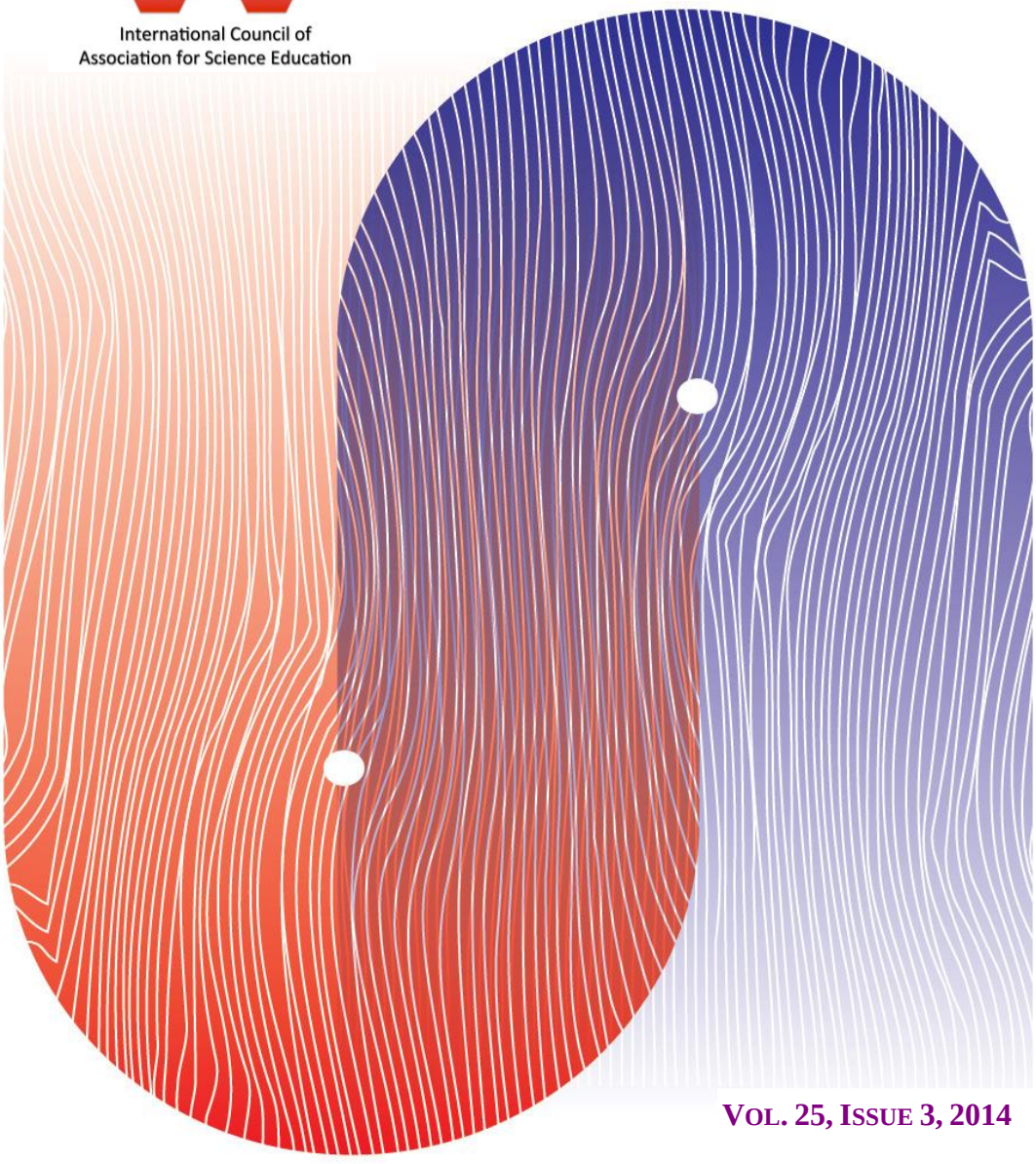
SCIENCE EDUCATION INTERNATIONAL

International Council of Association for Science Education



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Editorial

B. ZHANG

Science Education International publishes papers that report efforts in improving science education in regional contexts. There can be theoretical and/or empirical studies to achieve the goals. This issue focuses on reforming science educational systems in different parts of the world. You can see the following cases:

Kennedy and Odell introduce the history of STEM (Science, Technology, Engineering, and Mathematics) Education. Based on literature review, the paper suggests criteria of high quality STEM education programs. It highlights the importance of student engagement at both higher education and K-12 levels with a number of model programs. The discussion of assessment is certainly one of the most important elements that cannot be missed when having new STEM education programs.

Dickson and Kadbey reported the challenges of pre-service primary science teachers in Abu Dhabi, United Arab Emirates after 2007. Schools under Abu Dhabi Educational Council (ADEC) required teachers to be proficient in teaching science skills, such as inquiry-based learning, in order to implement the curriculum effectively. However, teachers who were taught in a didactic schooling system had few role models for the innovative way of teaching. The authors explored the schooling experiences of the first and fourth year pre-service teachers in their training college based on surveys in order to know how pre-service science teachers were prepared to change from the way they were taught to the government required innovative ways of science teaching and learning. While the self-report data were encouraging, the authors were clear that they needed to investigate the pre-service science teachers' real practice as the next step to see what happen.

Kocakaya and Gönen examined the influence of computer-assisted roundhouse diagrams on high school 9th grade students' academic achievements in the subjects of "Force and Motion" in schools in the Southeast of Turkey. "Pre-test post-test control group model" was applied to the study. A multiple-choice achievement test consist of 20 questions related to the subjects of "Force and Motion" was applied as pre-test and post-test to the students to determine the changes in their achievements.

The study showed that computer-assisted roundhouse diagrams have significant effect on students' academic achievement.

Correia and Cicuto used Neighbourhood Analysis (NeAn) as an innovative way to foster meaningful learning through the identification of Limited or Inappropriate Propositional Hierarchies (LIPHs) in Cmaps. The authors analysed 69 Cmaps from a higher education setting and found that 175 propositions were related to Compulsory Concept (CC). This subset of all propositions was enough for instructors to provide specific high-quality feedback to their students, even under normal teaching conditions. The authors concluded that NeAn can be meaningfully applied for assessing science students at secondary level and above, with special potential applicability across science subjects. The study provided an innovative way for improving the quality of science learning.

Şen, Yılmaz, and Yurdugül analysed the relations between students' achievement motivation, learning strategies and their epistemological beliefs in learning through structural equation modelling with 446 education faculty students in Turkey. The study confirmed that students' belief that learning depended on effort had significant effects on their learning strategies and their motivation. The finding added to other reform efforts to provide new ways and new ideas to promote effective science learning at different levels in different countries.

We hope readers of this issue benefit from the ideas and practices in improving their student science learning.