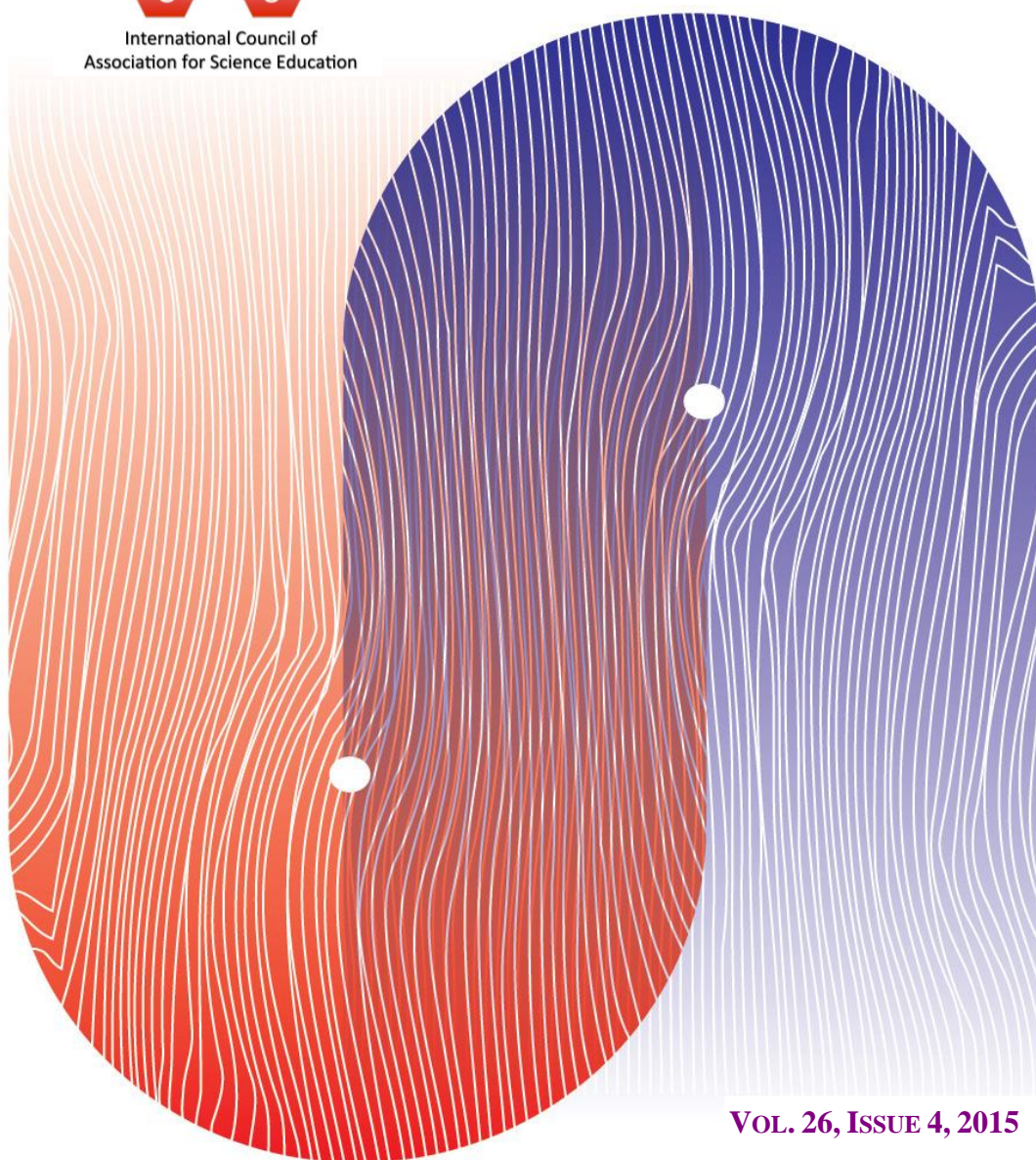


# SCIENCE EDUCATION INTERNATIONAL



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**Baohui H. Zhang**  
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## **Editorial**

**J. HOLBROOK, B. H. ZHANG**

The last issue of the SEI journal for the year 2015 comprises 9 articles from authors residing in the UK, US, Turkey, Kenya, Nigeria and Trinidad & Tobago and focus on secondary and primary science education as well as pre-service teacher education. The diversity of papers from different countries promotes a range of theoretical and practical perspectives.

The first article coming from the UK presents a geoscience syllabus that can be adopted by curriculum developers across the world, even those who are non-geoscience expert curriculum developers. In this article, he describes the origin of the idea, the holistic systems approach he and his collaborators have taken, and how more detailed content is determined through an analysis of the geoscience content of curricula of a range of countries. The syllabus has been published in January 2014.

The second article examines the validity of previously identified learning progressions for a different group of learners— Chinese students. The results indicate that American and Chinese students share similar learning progression from force-dynamics to scientific model-based reasoning. The article also draws attention to interesting similarities and differences between American and Chinese students' performances. Whereas American students perform better on items assessing the environmental impact of human behaviours, Chinese students perform better related to chemical equations, named forms of energy, and in mention the energy conservation principle more often than American students. This study suggests that these differences may be due to cultural aspects associated with the teaching of science between these two countries and puts forward implications for improving science education in each country.

The next and the third article in this journal issue, shows positive gains are achieved by contextualised, explicit reflective NOS instruction, in promoting pre-service science teachers' understanding of NOS. The study is undertaken on an elementary science method course, intended to provide pre-service teacher education participants with a theoretical framework for teaching science at the elementary level, and with desired attitudes toward science and science teaching, as well as a deeper understanding of the nature of science. An important aspect of the course was teaching preparation, which enabled aspects of NOS to be included in the lesson plans. Findings indicate that all pre-service students gained meaningful NOS ideas by the end of the course and point to the value of such an approach to the development of an understanding of NOS. The substantial contribution of the explicit reflective NOS instruction to the development of pre-service science teachers' NOS views is attributed to the setting of the explicit – reflective NOS instruction within a history of science setting, which integrates a

range of decontextualized and contextualized explicit reflective NOS activities, as suggested by Clough (2006).

Article 4 from Kenya introduces programmed instruction (PI) in a computerised setting. Although PI is said to be an older mode of instruction, the article suggest it is gaining renewed favour in usage with computer software, even though we know little about how this works. Based on findings the article concludes that programmed instruction is more effective in improving students' attitude whereas instruction using the popular conventional approaches gave similar attitudes as before the intervention. This significant change by the experimental group was attributed to the treatment received.

The fifth article by a Turkish researcher relates to NOS instruction and provides a critical review aimed at testing the linkage between NOS understanding and argumentation. The article draws attention to the research literature in the field and critical examines the claims made. The studies chosen for investigation are both from a scientific and a socio-scientific perspective. The article concludes by stating that it is impossible to disclaim interactions between NOS and argumentation enhancing both learners' argumentative discursive skills and NOS comprehension. However, the article also points out that it needs to be acknowledged that the interaction needs greater support through more research-based data and especially the role of Aptitude-Treatment Interaction (ATI) Research as a moderating influence.

Article 6 from Nigeria is a study investigating the Effects of a Target-Task Problem-Solving Model on Senior Secondary School Students' Performance in Physics using an experimental and control group. The study is conducted in two schools purposively selected and involves a total of 120 students. The data collected are analysed using means, standard deviations and analysis of covariance (ANCOVA), and the hypotheses put forward is tested at an alpha level of 0.05. The study indicates that the Target-Task Problem-Solving Model enhanced performance of low scoring level male students, but suggestions are given for further studies to give greater insights into the value of the model.

The article from Turkey, article 7, reflects on homework assignments and investigates students' views base on function attributes, attitudes and behaviour. The findings indicate that at the middle school level female students had higher positive responses than male students. Perhaps of more interest is that time spent on reading undertaking homework and researching assignments gave positive scores, whereas more time for private tuition and time spent on TG and games led to lower attitudes towards homework.

Article 8 from Trinidad and Tobago focuses on the use of analogies in teaching and draws attention to, on the one hand, teachers' lack of use of analogies and on the other, the poor teacher distinction between analogies and examples. This study is undertaken in one school in the West Indies following teachers at the middle and upper school levels in the teaching of science subjects. The article suggests that analogies can be considered as simple, or complex and although teachers make use of both types, the overall use of any analogies is low. Examples of analogies are explored and recommendations are made for science teaching.

The final article numerates the geography distributions of authors contribution to SEI over the last 5 years and examines the direction of general emphasis of articles. The article puts forward the intentions of ICASE in seeking

a wide distribution of articles from the 6 ICASE regions and that articles are favoured with a classroom practical link. The findings point to a strong acceptance of articles by European authors, although more authors submitting worldwide from non-English speaking countries. Regions where authors of articles are less well represented tend to be Africa, South America and Australia/New Zealand. The article also points out that papers related to topic of practical, classroom interest do dominate over the last 5 years.