

# Plenary Speakers



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## **Abstract**

The words we use, as well as the texts we write and read, form the basis of how information is comprehended and how meaning of that information is constructed and co-constructed. We explore how language related issues manifest in the teaching and learning of chemistry, and develop pedagogical strategies to help circumvent these issues. We demonstrate that language comprehension ability correlates strongly (with effect sizes similar to math ability!) with chemistry course performance. A deeper examination suggests that high comprehension ability may be sufficient to compensate for low prior knowledge. Additionally, we report the design and analysis of a multiple-testing intervention strategy that differentially aids those of low comprehension ability. The effect of question type (multiple choice versus elaborative interrogation) on this multiple-quizzing strategy was also investigated. With regard to text-based learning materials, we carried out linguistic analyses of popular general chemistry texts, the results of which suggest that these materials are appropriate for only low-knowledge students. Further studies probing the extent to which students benefit from reading texts on chemical bonding and redox concepts revealed an expertise reversal effect, corroborating these textual analyses. Finally, we have developed a writing-based strategy to help students construct and express meaning— “writing-to-teach” is a fusion of writing and peer instruction that permits students to generate explanatory knowledge.