

Accessing Science Ideas

Principal Investigator: [Karen Mutch-Jones](#) and [Gilly Puttick](#)

Funders: [National Science Foundation](#)

The Accessing Science Ideas (ASI) project developed and researched content enhancements that support science learning of middle school students with executive function learning disabilities. These content enhancements were designed to accompany two Full Option Science System (FOSS) curriculum units. Content enhancements do not change instructional content but rather ‘enhance’ it by making it accessible to all learners through explicit, concrete, and creative reinforcement of concepts.

After piloting and revising the content enhancements, ASI researchers studied 119 science classrooms. Half of these classroom teachers incorporated the content enhancements during unit instruction. Researchers compared the impact of content enhancements on students’ scientific reasoning, content knowledge, and confidence. In addition, they compared students with learning disabilities who did and did not use content enhancements and further identified ways in which these particular enhancements influenced accessibility to the curriculum and opportunities to improve science understanding.

The research also measured the extent to which the content enhancements and training increased science teachers’ understanding of executive function challenges, their ability to identify aspects of lessons that are most challenging for students with executive function learning disabilities, and their knowledge about approaches to address students’ needs. Project researchers anticipated that the students who will benefit the most from content enhancements would be those who find it difficult to organize, remember information, shift between concrete phenomena and abstract concepts and find it difficult to see relationships among ideas. They expect that these supports might have a positive impact on all students in inclusive science classrooms and will provide useful evidence and suggestions for teachers, curriculum developers and teacher educators.

The results from this study indicate that intervention teachers felt more effective in teaching science content to students with LD, and they outperformed control teachers in their knowledge of student challenges. They also generated more instructional supports to aid student comprehension. Furthermore, intervention classes outperformed control classes on a unit science assessment, and differences remained significant when disaggregating and comparing intervention and control data from typically developing and LD students. However, no significant decrease in the gap between typically developing and LD student learning was found.

Supporting Science Access for All Students: Using Content Enhancements to Create Pathways to the Big Ideas

Puttick, G. and Mutch-Jones, K.

—(2015). Science Scope

In this article, we share lessons learned from our *Accessing Science Ideas* (ASI) project that may help science teachers make “instructional shifts” as they teach a wide range of learners in their inclusive science classrooms. We describe an approach for creating a connected set of supports to make science curricula more accessible to students with LD, as well as others who struggle in middle school classrooms. We believe that science teachers might benefit from a process for translating general learning strategies into science-specific content enhancements (CEs), much like the one we designed for the ASI project, where CEs help students focus on the work of individual science activities and reason across investigations to make sense of the concepts they are studying.

Article is available for purchase from the NSTA [here](#).

View digital version [here](#). Click through to p. 31.