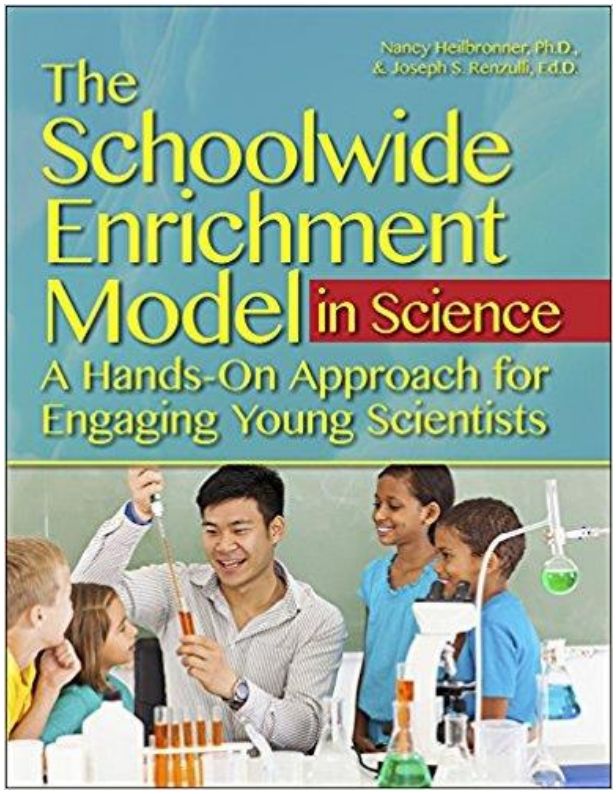
Book Review

A Hands-On Approach for Engaging Young Scientists

"The Schoolwide Enrichment Model in Science" by Nancy Heilbronner and Joseph S. Renzulli

By Dassi Citron



In our current climate of STEM and STEAM initiatives, science education is experiencing renewed interest. There are Maker Faires, makerspaces, and YouTube videos of projects created by young engineers going viral. The release of *The Schoolwide Enrichment Model in Science: A Hands-On Approach for Engaging Young Scientists* by Nancy Heilbronner and Joseph Renzulli is a well-timed compilation of research-based ideas, theoretical constructs, and useful tools directed toward achieving exemplary science instruction in the 21st century. It informs, in layered chapters, ways for teachers to provide guidance for students who have talent in science. This professional text works best for educators who teach in the upper grades (primary through high school), though many of the frameworks could also be adapted to suit students of all ages and proclivities.

The contents of *The Schoolwide Enrichment Model in Science* should be slowly savored and will be best used in either a science methods class, or with a professional development team. Additionally, Heilbronner and Renzulli's text successfully weaves in anecdotes about students of all ages who have done impressive and original work in science.

Chapter one addresses the theoretical and research-based components that underlie the schoolwide enrichment model (SEM). It also provides a summary of this program, which has been used for decades. During this chapter, the authors ask, "How can we develop high levels of interest, engagement, and enthusiasm for scientific inquiry?" This is a timely query; young children seem to have an insatiable appetite for all things scientific, but as they move through grade levels, their excitement often wanes considerably.

Chapter two discusses the practice of SEM. Heilbronner and Renzulli detail the first

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delivery service component, i.e., how students are selected. Many measures are used: achievement tests, teacher nominations, assessment of potential for creativity, as well as self-nomination and parent nomination. A range of surveys and forms are provided as tools to help with this process. It is important to note that self-reflection—as a learning and assessment protocol—becomes an integral part of both the selection process and the evaluation of outcomes in the final stages of a given project.

The second delivery component is a series of curriculum modification techniques that include differentiation, compacting, and increasing the depth of experience for the most gifted students. Providing a platform for students to select their own content is an integral part of the program. This fits well with current design theory and complements the notion that learning is most meaningful when it is in the context of real-life problems. They also reinforce the view that the ultimate goal of educators is to replace dependent and passive learning with independence and engaged participation. Therefore, teachers facilitate, not lecture.

Engaging students through activities in science is delineated in chapters 4 through 6. The meat of the SEM experience includes the idea that inquiry learning is iterative, and investigations should proceed with the notion that there are no correct or incorrect answers. Students develop their investigations through the process of personalizing their ideas, and use of authentic methodology; they conduct their research with the end goal of presenting their findings. Students are encouraged to explore and manipulate materials as they create and invent.

One embedded anecdote illustrates a particularly meaningful investigation. A fourth grade student had a passionate interest in researching skin disease. He analyzed data and planned a "Type III activity," posed a question, met with experts, and conducted a study. He designed a comic book to inform children about skin care. After follow-up data was completed, the student appeared on local television with his findings, which eventually led to the development of a corporate skin care campaign.

The final chapters concern additional components to consider when implementing SEM: compacting and differentiation, cluster grouping, and gifted programs. These chapters include important links to literacy learning. They also address challenges to implementation, along with a detailed discussion of useful technologies to include when using the SEM model.

Although the SEM approach joins the ranks of other trends in science education, the authors make no mention of similar initiatives, like the Reggio Emilia movement, which also incorporates problem-based inquiry (for the early childhood population), and the Teachers College ELA unit of study on science experiments, where teachers blend inquiry with scientific problem solving through performance tasks. Adding additional information about cutting-edge initiatives would serve to inform and strengthen instruction for both gifted and scientifically curious students.

Nevertheless, Heilbronner and Renzulli's well-designed text provides a sound methodological and procedural model with gems of inspiration for all who teach science in the 21st century. It is a rich and varied guidebook for educators who have long scratched their heads and wondered what to do with those curious and gifted young scientists in their classrooms.

"The Schoolwide Enrichment Model in Science: A Hands-On Approach for Engaging Young Scientists." By Nancy Heilbronner and Joseph S. Renzulli. Waco, TX: Prufrock Press, 2016. ISBN: 978-1-61821-499-7

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Joseph S. Renzulli, Ed.D., is a long-time faculty member of the department of educational psychology at the University of Connecticut and was selected by the university as one of its distinguished professors.

About the Reviewer

Dassi Citron is an adjunct professor in the School of Education at Mercy College. She previously taught in the Scarsdale and East Williston School districts in New York. Additionally, she worked at the St. Bernard's School in New York City as an elementary science teacher.