



Research Update

Center for Technology in Learning

Research and Innovation in Learning



NanoSense: Learning and Attitudes Among High School Students in Nanoscale Science

NanoSense is one of a few innovative programs addressing the question of how to teach nanoscale science at the high school level. Working with scientists and educators, NanoSense is creating and testing curriculum units to help high school students integrate nanoscale concepts with core scientific ideas.

Students showed significant gains with large effect sizes on unit-specific pre/post tests, and were interested and excited by the units. Analysis continues into the depth of student learning these results exhibit. Pre/post surveys of student attitudes about science showed significant gains, mainly on how students perceived the usefulness of science to everyday life. [Download free NanoSense Units and learn more at NanoSense.org.](#)



[NanoSense](#)

Teachers Need Good Curriculum Materials and Guidance for Adapting Them

Giving teachers high-quality science curriculum is not enough, as shown in a recent study by CTL. In the study, Transforming Instruction by Design in Earth Science (TIDES), researchers randomly assigned teachers to one of three professional development programs or to a control group and measured impacts on teaching and learning. After analyzing the data they concluded that in addition to good curriculum materials, teachers need to be encouraged to adapt materials to their classrooms. Of the three professional development programs, the one that produced improvements to instruction and student achievement in Earth science combined training in the use of inquiry-based curriculum modules (Investigating Earth Systems, produced by the American Geological Institute) with a principled approach to unit design (Earth Science by Design, developed by TERC). Principal Investigator Bill Penuel says, "These results have important implications for curriculum, professional development, and policy in Earth science education. They suggest that curriculum development and professional development design need to go hand in hand. Further, policies that mandate curriculum use ought to be accompanied by resources for helping teachers adapt curriculum to their students and schools." [Learn more about the results.](#)

TIDES

[TIDES](#)

CTL Highlights

The Best Curriculum

- ▶ In a commentary published in *Education Week*, Charles Patton and Jeremy Roschelle make the case that the world's best curriculum will not be a conventional textbook. The current paper textbooks are one-size-fits-none. The path forward is through presenting curriculum in an interactive, digital, adaptable form organized around a highly coherent core learning progression. [Read the commentary.](#)

Analyzing Teachers' Professional Interactions

- ▶ How do teachers help each other to implement reforms? That question is the focus of the Catalyzing Network Expertise project. Using social network analysis, PIs Bill Penuel of CTL and Ken Frank of Michigan State University explored how collegial interactions support the transfer of knowledge needed to implement instructional reforms. With Margaret Riel of CTL and Ann Krause of the University of Toledo, they have published a paper in *Teachers College Record* that describes these results: [Analyzing Teachers' Professional Interactions in a School as Social Capital: A Social Network Approach.](#)

Learn more about **Principled Science Assessment Designs for Students with Disabilities (PADI)** in CTL's Winter 2008 e-Newsletter. This collaboration with the states of Kansas, Kentucky, Nevada, and South Carolina aims to create evidence-based, large-scale science assessment tasks for students with high incidence disabilities (learning disabilities and mild mental retardation). [Go to padi-se.sri.com.](#)

