ASU SKYSONG
TECHNOLOGY BASED LEARNING AND RESEARCH
ARIZONA STATE UNIVERSITY

FOR IMMEDIATE RELEASE

ASU's TECHNOLOGY BASED LEARNING AND RESEARCH CENTER RELEASES STUDY EXAMINING THE STATE OF PRACTICE OF DEEP CONCEPTUAL LEARNING IN U.S. SCHOOLS

Study results provide a window into DCL in math and science education in middle and high schools, highlighting the benefit of digital lessons and a need for professional development

Scottsdale, Ariz. — June 21, 2012 — According to a new study examining deep conceptual learning (DCL) in middle and high school education, teachers and administrators believe that DCL is very important for preparing students for careers and college. However, many report that time pressures, curricula that are too broad, standardized testing, student attitudes, and lack of resources make it challenging to support DCL in their schools.

These findings are part of a study, titled "Deep Conceptual Learning in Science and Mathematics: Perspectives of Educators and Educational Administrators," released today by Arizona State University's (ASU) Technology Based Learning and Research (TBLR) center. The study was prompted, in part, by the Common Core standards in math and the soon-to-be-released next generation science standards which emphasize depth over breadth in an effort to help students move from simple memorization to deep, meaningful learning.

In the study, author Peter Rillero, Ph.D. reports the results of a questionnaire, which was administered in May, investigating what U.S. teachers and administrators think about DCL, the extent to which it is implemented, methods and materials used to engage students in DCL, and the obstacles to and benefits of implementing DCL. Rillero is an associate professor of science education at Mary Lou Fulton Teachers College at ASU.

Challenges

Teachers reported several challenges with regard to implementing DCL in their schools. Time, including a lack of instructional time and prep time, was listed as the greatest limiting factor. Next, teachers indicated that many students had formed habits consistent with a surface learning style, and overcoming these habits was a struggle. The third greatest challenge was the need to improve standardized test results, which resulted in teaching geared toward a test rather than a focus on deep conceptual understanding.

State of Practice of DCL

Most respondents stated they were implementing DCL (87 percent of teachers and 77 percent of administrators) and using technology to support DCL (79 percent of teachers and 64 percent of administrators). The top five most frequent methods used by teachers to engage students in DCL were experiments or labs, real world applications of content, discussions and debates, the use of technology, and inquiry-based methods. Teachers and administrators agreed that the methods least likely to yield DCL were the use of PowerPoint presentations, classroom lectures, and readings from textbooks.

Although implementing DCL is viewed with great importance, support appears to be lacking. More than half of the teachers and administrators did not believe that the current instructional practices supported DCL, and even fewer had had some professional development in DCL. Moreover, more than 90 percent of teachers and administrators would like to have more (a) opportunities for professional development in DCL and (b) materials and technology programs that support DCL.

Benefits

On average, teachers and administrators agreed that deep conceptual learners become life-long learners, the environment influences whether students become deep conceptual learners, and an interactive learning environment supports DCL more than textbooks. They indicated that deep conceptual learners tended to be more effective thinkers, better problem solvers, and better prepared for success after school.

"Although teachers and administrators endorsed the importance of DCL practices in education, they would like to have more opportunities for professional development and better access to instructional materials that foster DCL," said Rillero. "The results support the importance of technology in implementing DCL, particularly as schools move toward the Common Core State Standards which focus on fewer concepts but at a much deeper level. With fewer key standards to cover, more professional development, and effective tools and methods, teachers and administrators can transform how students learn math and science in our schools — and turn disinterested surface students into deep conceptual learners."

"Teachers tell us everyday how important technology is in helping their students grasp difficult and abstract concepts," said Jim Bowler, CEO of Adaptive Curriculum, the developer of web-based, concept mastery solutions in math and science. "Unlike learning by rote or drill-and-practice, a real-world active learning approach takes learning to a higher level by motivating students to explore, make hypotheses, manipulate items and see the impact of their decisions. With digital, problem-based learning experiences, students master critical math and science concepts — and build higher order thinking and problem-solving skills, which is essential to meet the new, more rigorous standards being adopted across the country."

About Technology Based Learning and Research

As an integral part of Arizona State University's innovation and research initiatives, TBLR focuses on research and large-scale delivery of educational materials as well as technology training and integration using computers and other information and communication technologies. For more information, please visit http://tblr.asu.edu.

# # #

Media Contact:

Leslie Eicher, APR
Eicher Communications Inc.
314-965-1776 or Leslie@EicherCommunications.com