

## **Title of Panel: Using Cognitive Science to Better Understand Why, for Whom, and Under What Conditions Interventions Succeed or Fail**

### **Abstract:**

This symposium applies cognitive principles to development and testing of education interventions, and addresses how findings from cognitive science research can be used to better understand why, for whom, and under what conditions interventions succeed or fail. Using the Advancement Via Individual Determination (AVID) program as an example, curriculum developers, education researchers, and cognitive psychologists discuss how understanding metacognitive principles may help explain why AVID--which provides instruction in supportive skills (such as studying, organization, writing, and note-taking)--failed to demonstrate strong effects on over 14,000 ninth-graders' learning and study skills. Following a presentation summarizing the AVID efficacy study, cognitive psychologists present conditions under which students best manage their learning and compare these study approaches to those promoted by AVID.

### **Session Summary**

This symposium focuses on how cognitive science research may help curriculum developers and education researchers better understand why certain interventions fail to demonstrate potent and robust effects in well-designed efficacy studies. Using the Advancement Via Individual Determination (AVID) program as an example, curriculum developers, education researchers, and cognitive psychologists discuss how understanding metacognitive principles may help explain why AVID--which provides instruction in supportive skills (such as studying, organization, writing, and note-taking)--failed to demonstrate positive effects.

As part of a larger initiative to improve student preparation for and access to postsecondary education, researchers working with Chicago Public Schools evaluated the impact of AVID on over 14,000 ninth-grade students' learning and study skills. Researchers drew upon data from the school district; surveys of principals, teachers, and students done by the Consortium on Chicago School Research; and Consortium surveys of students in AVID classes. Survey data was used to evaluate whether AVID students reported more positive learning and study behaviors, greater support from teachers, and increased involvement in college planning. Findings indicated a lack of strong effects, leading researchers to conclude that instruction in supportive skills may not translate to large urban districts, and to question whether a program can improve student skills without changing what is happening in the classroom.

After an introduction describing the components of AVID's instruction in supportive skills, researcher Jenny Nagaoka summarizes outcomes of the recent efficacy study on AVID. Cognitive psychologists on the panel--Jennifer Wiley and 2009 PECASE awardee Katherine Rawson--discuss metacognitive strategies that have been shown to improve self-regulated learning, including the decisions students make when deciding what to study, how long to study, and how to study, demonstrating how good study decisions rest on accurate monitoring of ongoing learning, a realistic mental model of how learning happens, and appropriate use of study strategies.

Current metacognitive research demonstrates conditions under which students can best manage

their own learning (e.g., using spaced retrieval practice, differentiating well-learned material from less-learned material, judging one's own level of comprehension, using study methods that support durable and efficient learning, and giving appropriate weight to given retention intervals). The panel compares these metacognitive self-study approaches to those employed by AVID as a possible explanation for its lack of potent and robust outcomes. Panelists debate the premise that conventional strategies perceived as most effective, often fail to support long-term retention and transfer--leading curriculum developers, teachers, and learners alike to mistakenly choose poorer conditions of learning. Doug Rohrer, cognitive psychologist and author of the 2010 Educational Researcher article "Recent Research on Human Learning Challenges Conventional Instructional Strategies," serves as discussant, revealing results of current experimentation that challenge the most widely used study practices. Allen Ruby and Carol O'Donnell of the Institute of Education Sciences will moderate this panel and facilitate discussion. This symposium applies cognitive principles to the development and testing of education interventions, and addresses how findings from cognitive science research can be used to better understand why, for whom, and under what conditions interventions succeed or fail.