Funding Opportunities for Cognitive and Computer Scientists through the Institute of Education Sciences

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Abstract
The Institute of Education Sciences (IES) provides funding opportunities for researchers to bring their knowledge of learning, cognitive science, and technology to bear on education practice. This panel describes opportunities available through the National Center for Education Research and the National Center for Special Education Research.

Funding Opportunities at the Institute of Education Sciences

Several members of the Association for the Advancement of Artificial Intelligence (AAAI) have received or expressed interest in funding from the Institute of Education Sciences (IES). This invited joint-session talk is an opportunity for other AAAI members to learn more about the research programs funded by IES.

Research funded by IES, in general, focuses on improving learning and academic achievement, reducing the achievement gap between high-performing and low-performing students, and increasing access to and opportunity for postsecondary education. IES is comprised of four National Centers, and funding opportunities through two of them -- the National Center for Education Research (NCER) and National Center for Special Education Research (NCSER) -- are described here.

NCER supports rigorous research that addresses the nation’s most pressing education needs. A wide range of populations (from early childhood to adult education) is covered by the 14 established research programs, which include: reading and writing; mathematics and science; cognition and student learning (CASL); teacher quality; policy, finance and systems; education leadership; early childhood programs and policies; middle and high school reform; social and behavioral context for academic learning; English language learners; interventions for struggling adolescent and adult readers and writers; postsecondary education; and education technology (Ed Tech).

NCSER sponsors a comprehensive program of special education research designed to expand the knowledge and understanding of infants, toddlers and children with disabilities, and the 10 established long-term programs cover a variety of topics, such as cognition and student learning in special education; autism spectrum disorders; and reading, writing and language development.

Grants are available for five types of research projects, termed “Goals.” Here we describe Goals 1 through 5 in general, and in the subsequent two sections we contextualize them in the CASL and Ed Tech programs.

Goal 1 (Exploration) focuses on (a) the exploration of the association between education outcomes and malleable factors and (b) the examination of factors and conditions that may mediate or moderate the relations between malleable factors and education outcomes. For example, one purpose of this Goal is to explore the underlying processes that may be operating to enhance or inhibit learning outcomes. Goal 2 (Development/Innovation) focuses on the development of and innovation in education interventions – curricula, instructional approaches, technology, policies, and programs. Goal 3 (Efficacy and Replication) funds efficacy trials to determine whether or not fully developed interventions – programs, practices, and policies – are effective under specified conditions (e.g., urban schools with high turnover rate) and with specific types of students (e.g., English language learners). Goal 4 (Scale-up evaluations) funds evaluations of interventions – programs, practices, and policies – to determine whether or not fully developed interventions are effective when they are implemented under conditions that would be typical if a school district or other education delivery setting were to implement them across a variety of conditions (e.g., different student populations, different types of schools). Goal 5 (Measurement) focuses primarily on assessment development and validation. While this goal structure generally applies across all programs, each program has its own restrictions and requirements.

The Cognition and Student Learning Research Program
NCER and NCSER both offer research programs that support research in the area of Cognition and Student Learning. The purpose of this program is to improve
student learning by bringing recent advances in cognitive science to: identify underlying processes involved in reading, writing, mathematics skills, or science that are predictive of student achievement in the relevant domain (Goal 1); develop interventions – instructional approaches, practices, and curricula – for improving student learning (Goal 2); establish the efficacy of existing interventions and approaches for improving student learning with efficacy or replication trials (Goal 3); and develop measurement tools that can be used to improve student learning and achievement (Goal 5). CASL does not support Goal 4 projects. The long-term outcome of these programs will be an array of tools and strategies (e.g., instructional approaches, computer tutors) that are based on principles of learning and information processing gained from cognitive science and that have been documented to be efficacious for improving learning in education delivery settings.

Although cognitive science has, over the past 30 years, generated new and important fundamental knowledge on how people learn, most of these research principles have not been systematically incorporated into education practice, either at the level of instruction or through the creation of materials that support teaching and learning. The purpose of the Cognition and Student Learning research programs are to establish a scientific foundation for education by building on these theoretical and empirical advances and applying them to education practice with the goal of improving students learning and academic achievements.

**Education Technology Research Program**

Another of the NCER research programs that may be of interest to the AAAI members is the Education Technology research program. The purpose of this program is to support research on education technology tools that are designed to provide or support instruction for students, or to provide professional development for teachers in five topic areas: reading, writing, mathematics, science, or study skills.

IES intends to contribute to improvement in these areas by: developing innovative education technology tools intended to improve reading, writing, mathematics, science, or general study skills (Goal 2); evaluating through efficacy or replication trials fully developed education technology tools (Goal 3); evaluating the effectiveness of fully developed education/technology tools that are implemented at scale (Goal 4); and developing and/or validating assessments that use education technology and that can be used in instructional settings (Goal 5). The Ed Tech program does not support Goal 4 projects. The long-term outcome of this program will be an array of education technology tools that have been documented to be effective for improving achievement in the topic areas.

**Invited Speakers**

Program officers, Dr. Carol O'Donnell (Cognition and Student Learning) and Dr. Jonathan Levy (Education Technology), will be available to discuss the IES research programs with AAAI members and offer specific recommendations regarding the application process with a focus on the substantive requirements for the various NCER and NCSER programs.