EDUCATION RESEARCH GRANTS

CFDA NUMBER: 84.305

RELEASE DATE: April 6, 2007

REQUEST FOR APPLICATIONS NUMBER: IES-NCER-2008-01

INSTITUTE OF EDUCATION SCIENCES
http://ies.ed.gov/

LETTER OF INTENT RECEIPT DATE: **May 24, 2007 and September 6, 2007**

APPLICATION DEADLINE DATE: **July 26, 2007 and November 1, 2007**

THIS REQUEST FOR APPLICATIONS CONTAINS THE FOLLOWING INFORMATION:

PART I. GENERAL OVERVIEW

1. REQUEST FOR APPLICATIONS

In this announcement, the Institute of Education Sciences (Institute) describes the research grant programs that are funded through the National Center for Education Research. Separate announcements are available on the Institute's website that pertain to the predoctoral and postdoctoral research training programs, and national research and development centers funded through the National Center for Education Research and to the discretionary grant competitions funded through the Institute's National Center for Special Education Research (http://ies.ed.gov/ncser).

The Institute invites applications for research projects that will contribute to its education research programs in Reading and Writing; Mathematics and Science Education; Cognition and Student Learning; Teacher Quality – Reading and Writing; Teacher Quality – Mathematics and Science Education; Social and Behavioral Context for Academic Learning; Education Leadership; Education Policy, Finance, and Systems; Early Childhood Programs and Policies; High School Reform; Interventions for Struggling Adolescent and Adult Readers and Writers; Postsecondary Education; and Education Technology. For the FY 2008 competition, the Institute will consider only applications that meet the requirements outlined below under Part II Research Grant Topics and Part III Requirements for the Proposed Research.

2. OVERVIEW OF THE INSTITUTE'S RESEARCH PROGRAMS

The Institute's over-arching priority is research that contributes to improved academic achievement for all students, and particularly for those whose education prospects are hindered by inadequate education services and conditions associated with poverty, race/ethnicity, limited English proficiency, disability, and family circumstance.

With academic achievement as the major priority, the Institute focuses on outcomes that differ by periods of education. In the infancy and preschool period, the outcomes of interest are those that enhance readiness for schooling, for example, language skills, and for infants and toddlers with disabilities, developmental outcomes. In kindergarten through 12th grade, the core academic outcomes of reading and writing (including reading and writing in the disciplines), mathematics, and science are emphasized, as well as the behaviors and social skills that support learning in school and successful transitions to employment, independent living, and post-secondary education. At the post-secondary level, the focus is on enrollment in and completion of programs that prepare students for successful careers and lives. The same outcomes are emphasized for students with disabilities across each of these periods, and include the functional outcomes that improve educational and transitional results. The acquisition of basic skills by adults with low levels of education is also a priority.

In conducting research on academic outcomes, the Institute concentrates on conditions within the control of the education system, with the aim of identifying, developing, and validating effective education programs, practices, policies, and approaches as well as understanding the factors that influence variation in their effectiveness such as implementation. Conditions that are of highest priority to the Institute are in the areas of curriculum, instruction, assessment (including the identification of students

with disabilities), the quality of the education workforce, and the systems and policies that affect these conditions and their interrelationships (for example, accountability systems, delivery mechanisms including technology, and policies that support the ability of parents to improve educational results for their children through such means as choice of education services and provision of school-related learning opportunities in the home).

In this section, the Institute describes the overall framework for its research grant programs. Specific information on the research topics described in this announcement may be found in the sections pertaining to each education research program:

- Reading and Writing
- Mathematics and Science Education
- Cognition and Student Learning
- Teacher Quality – Reading and Writing
- Teacher Quality – Mathematics and Science Education
- Social and Behavioral Context for Academic Learning
- Education Leadership
- Education Policy, Finance, and Systems
- Early Childhood Programs and Policies
- High School Reform
- Interventions for Struggling Adolescent and Adult Readers and Writers
- Postsecondary Education
- Education Technology

The Institute addresses the educational needs of typically developing students through its Education Research programs and the needs of students with disabilities through its Special Education Research programs. Both the Education Research and the Special Education Research programs are organized by outcomes (e.g., reading, mathematics), type of education condition (e.g., curriculum and instruction; teacher quality; administration, systems, and policy), grade level, and research goals.

A. Outcomes

The Institute's research programs focus on improvement of the following education outcomes: (a) readiness for schooling (pre-reading, pre-writing, early mathematics and science knowledge and skills, and social development); (b) academic outcomes in reading, writing, mathematics, and science; (c) student behavior and social interactions within schools that affect the learning of academic content; (d) skills that support independent living for students with significant disabilities; and (e) educational attainment (high school graduation, enrollment in and completion of post-secondary education).

B. Conditions

In general, each of the Institute's research programs focuses on a particular type of condition (e.g., curriculum and instruction) that may affect one or more of the outcomes listed previously (e.g., reading). The Institute's research programs are listed below according to the primary condition that is the focus of the program.

a. ***Curriculum and instruction***. Several of the Institute's programs focus on the development and evaluation of curricula and instructional approaches. These programs include: (a) Reading and Writing;

(b) Mathematics and Science Education; (c) Cognition and Student Learning; (d) Social and Behavioral Context for Academic Learning; (e) Early Childhood Programs and Policies; (f) Interventions for Struggling Adolescent and Adult Readers and Writers; and (g) Education Technology.

b. ***Quality of the Education Workforce***. A second condition that affects student learning and achievement is the quality of teachers and education leaders (e.g., principals, superintendents). The Institute funds research on how to improve teacher quality through its programs on (a) Teacher Quality – Reading and Writing; (b) Teacher Quality – Mathematics and Science Education; and (c) Research on Education Leadership.

c. ***Administration, systems, and policy***. A third approach to improving student outcomes is to identify systemic changes in the ways in which schools and districts are led, organized, managed, and operated that may be directly or indirectly linked to student outcomes. The Institute takes this approach in its programs on (a) Education Policy, Finance, and Systems; (b) Early Childhood Programs and Policies; (c) High School Reform; and (d) Postsecondary Education.

Applicants should be aware that some of the Institute's programs cover multiple conditions. For example, the following programs cover multiple conditions: (a) Cognition and Student Learning; (b) Early Childhood Programs and Policies; (c) High School Reform; (d) Education Technology; and (e) Postsecondary Education.

C. Grade Levels

The Institute's research programs also specify the ages or grade levels covered in the research program. The specific grades vary across research programs and within each research program, and grades may vary across the research goals. In general, the Institute supports research for (a) pre-kindergarten and kindergarten, (b) elementary school, (c) middle school, (d) high school, (e) post-secondary education, (f) vocational education, and (g) adult education. In addition, the Institute supports research on infants with disabilities.

D. Research Goals

The Institute has established five research goals for its research programs. Within each research program one or more of the goals may apply: (a) Goal One – identify existing programs, practices, and policies that may have an impact on student outcomes and the factors that may mediate or moderate the effects of these programs, practices, and policies; (b) Goal Two – develop programs, practices, and policies that are theoretically and empirically based; (c) Goal Three – establish the efficacy of fully developed programs, practices, and policies; (d) Goal Four – provide evidence on the effectiveness of programs, practices, and policies implemented at scale; and (e) Goal Five – develop or validate data and measurement systems and tools.

For a list of the Institute's FY 2008 research and training grant topics – including grant competitions through the Institute's National Center for Education Research and National Center for Special Education Research, please see Table 1 below. Funding announcements for these competitions may be downloaded from the Institute's website at http://ies.ed.gov.

Table 1: FY 2008 Research and Training Grant Topics

National Center for Education Research

1. Research Grant Topics
   - Reading and Writing
   - Mathematics and Science Education
   - Cognition and Student Learning
   - Teacher Quality – Reading and Writing
   - Teacher Quality – Mathematics and Science Education
   - Social and Behavioral Context for Academic Learning
   - Education Leadership
   - Education Policy, Finance, and Systems
   - Early Childhood Programs and Policies
   - High School Reform
   - Interventions for Struggling Adolescent and Adult Readers and Writers
   - Postsecondary Education
   - Education Technology

2. Research Training Grant Topics
   - Postdoctoral Research Training Program
   - Predoctoral Research Training Program

3. National Research and Development Center Topics
   - Cognition and Science Instruction
   - Instructional Technology

National Center for Special Education Research

1. Research Grant Topics
   - Early Intervention, Early Childhood Special Education, and Assessment for Young Children with Disabilities Research
   - Mathematics and Science Special Education Research
   - Reading, Writing, and Language Development Special Education Research
   - Serious Behavior Disorders Special Education Research
   - Individualized Education Programs and Individualized Family Service Plans Research
   - Secondary and Transition Services Research
   - Autism Spectrum Disorders Research
   - Response to Intervention Research
   - Related Services Special Education Research

2. Research Training Grant Topics
   - Postdoctoral Special Education Research Training

3. National Research and Development Center Topics
   - Center on Serious Behavior Disorders at the Secondary Level
   - Center on Response to Intervention in Early Childhood Special Education

PART II. RESEARCH GRANT TOPICS

For FY 2008, the Institute's National Center for Education Research is accepting applications for research grants under 13 topics. There are two application deadlines for each of these 13 topics: July 26, 2007, and November 1, 2007. In this section, the Institute describes the research grant topics.

Across its research programs, the National Center for Education Research is particularly interested in interventions for students who are from low income backgrounds and/or racial, ethnic, and linguistic minority groups that have underachieved academically, but will consider applications that focus on other populations if the results are likely to be applicable across socioeconomic, racial, ethnic, and linguistic categories.

2. MATHEMATICS AND SCIENCE EDUCATION

Program Officer: Dr. Christina Chhin (202-219-2280; Christina.Chhin@ed.gov)

A. Purpose

The Institute intends for the research program on Mathematics and Science Education (Math/Science) to fulfill five goals: (1) identifying curriculum and instructional practices that are associated with better mathematics or science outcomes, as well as mediators and moderators of the relations between these practices and student outcomes; (2) developing new curricula and instructional approaches to mathematics and science education that will eventually result in improving mathematics and science achievement; (3) establishing the efficacy of fully developed curricula and instructional approaches to mathematics and science education with small efficacy or replication trials; (4) providing evidence on the effectiveness of mathematics and science curricula and instructional approaches that are implemented at scale; and (5) developing and validating assessments for diagnosing sources of mathematics difficulties. The long-term outcome of this program will be an array of tools and strategies (e.g., curricula, programs) that have been demonstrated to be effective for improving mathematics and science learning and achievement.

B. Background

Current levels of mathematics and science achievement at the elementary and secondary levels suggest that the United States is neither preparing the general population with levels of mathematics and science knowledge necessary for the 21st century workplace, nor producing an adequate pipeline to meet national needs for domestic scientists and mathematicians. In the 2005 National Assessment of Educational Progress (NAEP), only two percent of U.S. students attained advanced levels of mathematics or science achievement by Grade 12. In mathematics, large numbers of U.S. students continue to score below the basic level. In the 2005 NAEP, 20 percent of Grade 4 students, 31 percent of Grade 8 students, and 39 percent of Grade 12 students scored below the "basic" level in mathematics. At Grade 4 scoring below the basic level means that the student is likely to miss problems such as using a ruler to find the total length of three line segments. At Grade 12 scoring below the basic level means that the student is unlikely to be able to solve problems such as finding the perimeter of a figure. Despite the fact that levels of mathematics achievement have improved over the past decade, achievement gaps remain wide with low levels of achievement being more likely among minority groups and students from low-income backgrounds

As in mathematics, many U.S. students are not attaining mastery of rudimentary science knowledge and skills. In the 2005 NAEP, 32 percent of Grade 4 students**,** 41 percent of Grade 8 students, and 46 percent of Grade 12 students scored below the "basic" level in science. At Grade 4, students performing below the basic level are likely to miss problems such using a data table to determine which day has the most daylight. At Grade 12, students performing below the basic level are likely to miss problems such as graphing the populations of two species. As in mathematics, low levels of achievement are more likely among minority groups and students from low-income backgrounds.

Very little rigorous research has been conducted to evaluate the effectiveness of mathematics or science curricula and instructional practice for improving student learning and achievement. For example, the Institute of Education Sciences' What Works Clearinghouse conducted reviews of elementary and middle school mathematics curricula. For elementary school mathematics curricula, 77 studies were identified that were (a) curriculum evaluations, (b) with relevant math outcome measures, and (c) covering at least one semester. Out of these studies, one study met the Clearinghouse's evidence standards for drawing causal conclusions, seven studies met the evidence standards with reservations, and 69 studies did not meet the evidence screens.[1] For the middle school mathematics curricula, 76 studies were identified as curriculum evaluations with relevant math outcomes that covered at least one semester. Out of these 76 studies, three studies met the Clearinghouse's evidence standards, 11 met the evidence standards with reservations, and 62 did not meet the evidence screens.[2] Out of the 153 evaluations of elementary and middle school mathematics curricula, the What Works Clearinghouse has found that 86% of the studies either employed research methods that were inappropriate for supporting causal conclusions, or insufficient information was reported for the Clearinghouse to calculate effect sizes. To address the need to improve mathematics and science education in the United States, the Institute seeks to fund applications that address the need to develop and evaluate mathematics or science curricula and instructional approaches.

The Institute intends for the Mathematics and Science Education program to support research on the identification, development, and evaluation of curricula and instructional approaches designed to improve mathematics and science proficiency from kindergarten through high school, and basic mathematics skills at the postsecondary and adult education levels.

The Institute encourages researchers to consider multivariate analyses of district or state databases in order to identify existing programs and practices that may be associated with better mathematics or science outcomes and to examine factors and conditions that may mediate or moderate the relations between the student outcomes and these programs and practices. Another approach to the identification of potentially effective instructional practices is for researchers to conduct detailed, quantifiable observational measures of mathematics or science instruction (types of instruction, frequency, duration, under what circumstances), and then use the instructional data in conjunction with child characteristics to predict subsequent math or science performance. The goal here is to identify what type or combination of instructional activities is associated with better student outcomes and for which students.

---

[1] Downloaded from the What Works Clearinghouse on February 20, 2007, at http://www.whatworks.ed.gov/Topic.asp?tid=04&ReturnPage=default.asp.

[2] Downloaded from the What Works Clearinghouse on February 20, 2007, at http://www.whatworks.ed.gov/Topic.asp?tid=03&ReturnPage=default.asp.

Researchers following this strategy who can successfully predict student performance could use this information as the basis for developing an intervention.

In addition to the identification, development, and evaluation of curricula and instructional approaches from improving mathematics and science achievement, the Institute invites proposals to develop and validate mathematics and science measurement tools for classroom assessments to be used for instructional purposes (e.g., progress monitoring). To improve mathematics and science skills, instruction may need to be tailored to the sources of difficulty that individual students experience. An ideal learning environment might involve regular and frequent assessment of skills and the possibility of individualized instruction for students based on the particular source of their difficulties. Under the Math/Science research program, the Institute intends to support the development of diagnostic assessments in mathematics and science and assessments to monitor progress in mathematics and science.

C. Specific Requirements

For the FY 2008 Mathematics and Science Education topic, applicants must submit under *either* Goal One *or* Goal Two *or* Goal Three *or* Goal Four *or* Goal Five. More details on the requirements for each goal are listed in the section on General Requirements of the Proposed Research. In this section, specific requirements that apply to applications to the Mathematics and Science Education topic are described.

Under the Math/Science program, applications must address:

- mathematics or science curricula designed to improve mathematics or science proficiency from kindergarten through high school;
- instructional approaches for teaching mathematics or science that could be implemented within the context of existing mathematics or science curricula from kindergarten through high school;
- curricula or instructional approaches for teaching basic mathematics skills to adults through adult and vocational education programs or through developmental/bridge programs designed to help under-prepared students acquire the skills to succeed in college; or
- mathematics or science assessments to support teaching from kindergarten through high school or to support teaching basic mathematics skills to adults.

Mathematics and science curricula and instructional approaches must be intended for use through schools and other education delivery settings (e.g., after-school programs).

Researchers, who are interested in identifying underlying or component processes of mathematics reasoning or science reasoning, and the relations of these processes to proficiency in mathematics or science, should refer to the Cognition and Student Learning research program.

PART III. REQUIREMENTS OF THE PROPOSED RESEARCH

14. GENERAL REQUIREMENTS OF THE PROPOSED RESEARCH

A. Basic Requirements

a. ***Resubmissions***. Applicants who intend to revise and resubmit a proposal that was submitted to one of the Institute's FY 2007 competitions but that was not funded must indicate on the application form that their FY 2008 proposal is a revised proposal. Their FY 2007 reviews will be sent to this year's reviewers along with their proposal. Applicants should indicate the revisions that were made to the proposal on the basis of the prior reviews using no more than 3 pages of Appendix A.

b. ***Applying to multiple topics***. Applicants may submit proposals to more than one of the Institute's FY 2008 competitions or topics. In addition, within a particular competition or topic, applicants may submit multiple proposals. However, applicants may submit a given proposal only once (i.e., applicants may not submit the same proposal or very similar proposals to multiple topics or to multiple goals in the same topic or to multiple competitions). If the Institute determines prior to panel review that an applicant has submitted the same proposal or very similar proposals to multiple topics within or across competitions and the proposal is judged to be compliant and responsive to the submission rules and requirements described in the Request for Applications, the Institute will select one version of the application to be reviewed by the appropriate scientific review panel. If the Institute determines after panel review that an applicant has submitted the same proposal or very similar proposals to multiple topics within or across competitions and if the proposal is determined to be worthy of funding, the Institute will select the topic under which the proposal will be funded.

c. ***Applying to a particular goal within a topic*.** To submit an application to one of the Institute's research programs, applicants must choose the specific goal under which they are applying. Each goal has specific requirements.

d. ***Determining which goal is most appropriate for the proposed project***. Applicants should read carefully the requirements for each Goal and the examples of appropriate projects under each Goal. The Institute strongly encourages potential applicants to contact the relevant program officer listed in Section 28 if they have any questions regarding the appropriateness of a particular project for submission under a specific goal.

B. Requirements for Goal One (Identification Projects)

Because the requirements for Goal One are essentially the same across the Institute's research grant topics, a generic description is used in the funding announcement. Consequently, the examples provided may not apply to a particular topic.

a. ***Purpose of identification studies*.** Through all of its research programs that include the Identification goal (Goal One), the Institute is interested in the identification of existing programs and practices that may be associated with better academic outcomes and examination of factors and conditions that may mediate or moderate the relations between student outcomes and these programs and practices.

For Goal One, the Institute invites applications to conduct analyses of multivariate data, such as longitudinal individual student data that exist in a number of federal-, state-, and district-level databases. Using existing longitudinal data sets, investigators are able to capitalize on natural variation or discontinuities in education practices. For example, in a particular year, a large district might have implemented an intervention (e.g., curriculum, program, policy) at the beginning of a specific year. An investigator might propose interrupted time series analyses of the district's longitudinal datasets to examine changes in student outcomes that follow the implementation of the new intervention.

The strongest approaches to statistical modeling of multivariate data involve testing two or more models of relationships using the same data. Because multivariate analyses cannot fully adjust for selection biases and the effects of variables that were not measured or were not measured well, they are seldom if ever sufficient to support strong causal conclusions about what works. However, when two or more models of relationships among variables are tested with the same data, it may be possible to determine that one is more plausible than another, thus providing information relevant to understanding what does not work, as well as what does work. That, in turn, can direct future efforts in avenues that are more likely to be productive.

As an alternative to analyzing existing longitudinal databases, applicants may propose to conduct a small scale descriptive longitudinal study with primary data collection in which they attempt to predict student outcomes based on differences in observed education practices. For example, a researcher might propose to conduct detailed, quantifiable observational measures of instructional practices (types of instruction, frequency, duration, under what circumstances), and then use the instructional data in conjunction with child characteristics to predict subsequent student performance. The objective here is to identify what type or combinations of instructional activities are associated with better student outcomes and for which students. Researchers following this strategy who can successfully predict student performance could use this information as the basis for developing an intervention (see, e.g., Connor, et al., 2007).

Evidence obtained through a Goal One project of the association between exposure to a program or practice and better student outcomes has the possibility of being used to support a subsequent application for a Goal Two (Development) or Goal Three (Efficacy) project.

By addressing the theoretical and empirical rationale for the study and the practical importance of the intervention (e.g., program, practice) that will be examined, Goal One applicants are addressing the significance of their proposal.

b. *Methodological requirements*. For all applications, including those submitted under Goal One, the proposed research design must be appropriate for answering the research questions or hypotheses that are posed.

(i) *Research questions*. Applicants should pose clear, concise hypotheses or research questions.

(ii) *Database*. Applicants proposing secondary data analyses should describe clearly the database(s) to be used in the investigation including information on sample characteristics, variables to be used, and ability to ensure access to the database if the applicant does not already have access to it. The database should be described in sufficient detail so that reviewers will be able to judge

whether or not the proposed analyses may be conducted with the database. If multiple databases will be linked to conduct analyses, applicants should provide sufficient detail for reviewers to be able to judge the feasibility of the plan. If the applicant does not currently have access to the databases needed for the study, the applicant should provide sufficient documentation (e.g., letters of agreement) to assure reviewers that access can be obtained and the project can be carried out in a timely fashion.

The applicant should describe the primary outcome measures to be used, including reliability and validity. In particular, applicants should provide sufficient information on the construct validity of the proposed measures. For example, if the applicant proposes to use a state database from which the primary outcome measure will be performance on a reading or mathematics achievement measure, the applicant should detail the standardized measure from which the reading or mathematics scores are derived.

(iii) *Primary data collection*. Applicants may propose a Goal One project in which the primary focus is on the collection and analysis of original data. The applicant should carefully describe the sample, measures (including reliability and validity), and procedures proposed for the primary data collection. Because Goal One projects must be designed to predict student outcomes, if observational data are collected, applicants should describe how the data would be collected (e.g., procedures for maintaining inter-observer reliability), coded, and quantified to allow quantitative analyses predicting the relation between what was observed and student outcomes.

Applicants may also propose to collect original data as a supplement to be used with an existing longitudinal database in order to answer the question of interest. In such cases, applicants should describe the sample and how the sample is related to or links to the proposed secondary database, the measures to be used (including information on the reliability and validity of the proposed instruments), and data collection procedures.

(iv) *Data analysis*. The applicant must include detailed descriptions of data analysis procedures. Because predictor variables relevant to education outcomes (e.g., student, teacher, or district characteristics) often covary, the Institute expects investigators to utilize the most appropriate state-of-the-art analytic techniques to isolate the possible effects of variables of interest. Analytic strategies should allow investigators to examine mediators and moderators of programs and practices. The relation between hypotheses, measures, independent and dependent variables should be well specified. Strong applications will include an explicit discussion of how exclusion from testing, or missing data, will be handled within the statistical analyses. Strong applications will propose an approach for comparing hypotheses or models of relationships among variables.

c. ***Personnel and resources***. Competitive applicants will have research teams that collectively demonstrate expertise in: (a) the relevant student outcome (e.g., reading, mathematics, student behaviors); (b) the type of intervention under investigation (e.g., curriculum, program, policy); (c) implementation of, and analysis of results from, the research design that will be employed; and (d) working with teachers, schools, or other education delivery settings that will be employed if original data will be collected. Competitive applicants will have access to institutional resources that adequately support research.

d. ***Awards***. Typical awards for projects at this level are $100,000 to $350,000 (total cost = direct + indirect costs) per year. For applicants proposing to do primarily secondary data analysis, the maximum duration of the award is 2 years. Applicants proposing to do short-term longitudinal studies may request up to 2 additional years (i.e., the maximum duration of the award is 4 years) and additional funds, but must justify the need for the additional time and funding. The size of the award depends on the scope of the project.

C. Requirements for Goal Two (Development Projects)
Because the requirements for Goal Two are essentially the same across the Institute's research grant topics, a generic description is used in the funding announcement. Consequently, the examples provided may not apply to a particular topic.

a. ***Purpose of Goal Two (Development).*** Through all of its research programs that include the Development goal (Goal Two), the Institute intends to support the development of education interventions – curricula, instructional approaches and programs. The Institute stresses that Goal Two applications are about development, rather than demonstrations of the efficacy of an intervention. Under Goal Two, the Institute does not intend to support applications that propose to allocate substantial resources for testing the effect of the proposed intervention. For example, the Institute does not intend to support under Goal Two applications in which the researcher proposes to spend one year developing the intervention and the second and third years on testing the effect of the intervention in a significant number of classrooms or schools. Applicants who have an intervention that could be tested for efficacy should apply to Goal Three.

From the Institute's standpoint, a funded development project would be successful if at the end of a 1- to 3-year development award, the investigators had a fully developed version of the proposed intervention, including prototypes of all materials and products necessary for implementation of the intervention in authentic education delivery settings, and evidence demonstrating the feasibility of its implementation in an authentic education delivery setting. The Institute anticipates that investigators with successful development projects would submit proposals to subsequent competitions for Goal Three (Efficacy) awards.

b. ***Requirements for proposed intervention***. Under Goal Two, the Institute invites applications to develop new interventions or further develop interventions that are in the early stages of development (e.g., those that do not have an entire program or product ready to evaluate). It is important for applicants to provide a strong rationale to support the development of the proposed intervention. In essence, applicants are answering the question: *Why is the proposed intervention likely to produce better student outcomes relative to current education practices?*

In strong applications, researchers provide context for the proposed intervention by including data on, or reviewing research describing, the attributes of typical existing practices. Understanding the shortcomings of current practice contributes to the rationale for the proposed intervention.

Applicants should clearly describe the intervention and the logic model for the intervention. For example, how do the features or components of the intervention relate to each other temporally (or operationally), pedagogically, and theoretically (e.g., why does A lead to B)? Applicants should provide

a strong theoretical and empirical justification for the design and sequencing of the features or components of the intervention. When applicants clearly describe the logic model that guides the intervention and the specific features making up the intervention, reviewers are better able to evaluate (a) the relation between the theoretical and empirical foundation for the intervention and the intervention (e.g., is the proposed intervention a reasonable operationalization of the theory?) and (b) the relation between the intervention and the outcome measures (e.g., do the proposed measures tap the constructs that the intervention is intended to address?).

Applicants should explain why the proposed intervention is likely to produce substantially better student outcomes relative to current practice. By clearly describing the intervention – particularly, the unique features of the intervention ("active ingredients") that are hypothesized to produce the desired improvement in student outcomes – as well as the typical existing practices, reviewers are better able to judge whether the proposed intervention has the potential to produce substantially better student outcomes because it is sufficiently different from current practices and has "active ingredients" that appear on the basis of theoretical or empirical reasons to be powerful agents for improving student learning.

In the rationale to support the proposed intervention, applicants should address the *practical* importance of the proposed intervention. For example, when the proposed intervention is fully developed, will it have the potential to improve students' achievement scores in educationally meaningful increments, if it were implemented over the course of a semester or school year? In addition, would the proposed intervention be both affordable for schools and easily implemented by schools (e.g., not involve major adjustments to normal school schedules)?

By describing (a) the intervention (e.g., features, components) and the logic model for the intervention, (b) the theoretical and empirical support for the proposed intervention, and (c) the practical importance of the intervention, Goal Two applicants are addressing aspects of the significance of their proposal.

c. ***Methodological requirements***. **For all applications, including those submitted under Goal Two, the proposed research design must be appropriate for answering the research questions or hypotheses that are posed.**

For Goal Two projects, applicants must clearly address the proposed methods for developing the intervention and testing the feasibility of implementation of the prototype in an authentic education delivery setting. Applicants should describe the systematic process they will use to collect empirical data that will provide feedback for refining the intervention. A major objective of Goal Two projects is to refine and improve the initial version of the intervention by implementing it, or components of it, observing its functioning, and making necessary adjustments in the design of the intervention so that it functions more as intended.

Strong applications include clear descriptions of the development activities so that reviewers will understand (a) what will be developed, (b) how it will be developed, and (c) when the development will take place. Applicants should describe what they would measure or observe to determine whether the intervention is working as intended when they are testing the feasibility of successive versions of the intervention. A useful by-product of such testing is a set of fidelity of intervention measures that could be used if the intervention were evaluated in an efficacy trial (see Goal Three).

A timeline that delineates the iterative process of drafting and revising the intervention (e.g., features or components of the intervention, procedures, training activities, and materials) is often a simple way of showing reviewers how research activities will feed into subsequent development (refinement) activities, so that information can be used to make decisions and improvements. A variety of methodological strategies may be employed during this phase. *For Development projects, reviewers need to understand the iterative development process to be used in the design and refinement of the proposed intervention.*

By the end of a Goal Two project, the Institute expects investigators to have a fully developed intervention and demonstrated that the intervention can be implemented in an authentic education delivery setting.

(i) *Sample*. The applicant should define, as completely as possible, the samples and settings that will be used to assess the feasibility and usability of the intervention.

(ii) *Research plan*. The applicant must provide a detailed research plan in which they detail the proposed procedures for developing the intervention. Strong applications will include clear descriptions of: (a) what needs to be developed; (b) the procedures for developing the intervention; and (c) the procedures (including sample, measures, and procedures for analyzing data) for determining if the intervention is functioning as intended (e.g., Does the software program crash when students use it? Are the activities planned for a particular lesson do-able within the allotted time?). *Applicants should describe the iterative development process to be used in the design and refinement of the proposed intervention, and plans for acquiring evidence about the operation of the intervention according to the logic model that they describe.*

(iii) *Measures*. Goal Two projects typically rely on the collection of process data that can help the researcher refine the intervention and provide insight into the feasibility and usability of the proposed intervention in authentic education delivery settings. Applicants should clearly describe (a) what needs to be observed in order to determine if the intervention is operating as intended and (b) how those observations will be collected. Observational, survey, or qualitative methodologies are encouraged to identify conditions that hinder implementation of the intervention.

d. ***Personnel and resources***. Competitive applicants will have research teams that collectively demonstrate expertise in: (a) the relevant content area (e.g., reading, mathematics, student behaviors); (b) type of intervention to be developed; (c) implementation of, and analysis of results from, the research design that will be employed; and (d) working with schools and other education delivery settings. Competitive applicants will have access to institutional resources that adequately support research.

An applicant may be or may involve *for-profit entities* in the project. Involvement of the commercial developer or distributor must not jeopardize the objectivity of the research. *Collaborations including for-profit developers or distributors of education products must justify the need for Federal assistance to undertake the evaluation of programs that are marketed to consumers and consider cost-sharing part of the cost of the evaluation.*

Applicants who previously or currently hold development grants with the Institute should describe the results and outcomes of those grants to date. They should indicate whether what was developed has been (or is being) evaluated for efficacy (Goal Three) and if results are available, what the results of those efficacy evaluations have been. The Institute intends to support researchers under Goal Two who can demonstrate their ability to develop interventions that can be used in the field and tested for efficacy.

e. ***Awards***. Typical awards for projects at this level are $150,000 to $500,000 (total cost = direct + indirect costs) per year. Development projects are for a maximum of 3 years. Development costs vary according to the type of intervention that is proposed. Larger awards will be considered. In all cases, the size of the award depends on the scope of the project.

D. Requirements for Goal Three (Efficacy and Replication Trials)

Because the requirements for Goal Three are essentially the same across the Institute's research grant topics, a generic description is used in the funding announcement. Consequently, the examples provided may not apply to a particular topic.

Under Goal Three, the Institute requests proposals to test the efficacy of fully developed interventions. By *efficacy*, the Institute means the degree to which an intervention has a net positive impact on the outcomes of interest in relation to the program or practice to which it is being compared.

a. ***Purpose of efficacy and replication trials***. Through all of its research programs that include the Efficacy and Replication goal (Goal Three), the Institute intends to fund efficacy trials to determine whether or not fully-developed interventions – programs, practices – are effective under specified conditions (e.g., urban schools with a high turnover rate among teachers), and with specific types of students (e.g., English language learners). Results from efficacy projects have less generalizability than results from effectiveness (scale-up) evaluations under Goal Four. The limited generalizability can arise both from the lack of a full range of types of settings and participants in the study, as well as through the intensive involvement of the developers and researchers in the implementation of the intervention. A well-designed efficacy trial provides evidence on whether an intervention **can** work, but not whether it would work if deployed widely. Under Goal Three, applicants may propose an efficacy trial to determine if an intervention will work under specific conditions or a replication trial to determine if an intervention shown to produce a net positive impact in one setting will produce a net positive impact under different conditions (e.g., with a different population of students).

Under Goal Three, an applicant might propose to examine the efficacy of the intervention in an experimental study in which, for example, half of the classrooms are randomly assigned to the intervention program and half are assigned to continue using standard district practices. Alternatively, if the research team hypothesized that a variation in the delivery of the program might improve the impact of the intervention, the team might propose instead to randomly assign: (a) one-third of the classrooms to the basic intervention; (b) one third of the classrooms to the variation; and (c) one-third of the classrooms to continue with standard district practices. *Applicants should use the efficacy and replication trials to determine the conditions, if any, under which an intervention produces meaningful improvement on academic outcomes.*

Also of interest to the Institute are proposals to compare the impact of two interventions that are based on different theoretical models. In such cases, the purpose might be to compare the efficacy of two well-developed approaches to improving student learning. One advantage to this approach is that,

relative to designs in which the comparison group experiences whatever the school or district currently provides (but see the discussion of "business-as-usual" treatments below), the investigator should have better knowledge of the critical components of each intervention and can attempt to create two conditions in which, for example, instruction varies on a number of critical components.

From the Institute's standpoint, a funded Efficacy/Replication project would be *methodologically successful* if at the end of the grant period, the investigators had rigorously evaluated the impact of a clearly specified intervention on relevant student outcomes and under clearly described conditions using a research design that meets the Institute's What Works Clearinghouse standards (http://whatworks.ed.gov), whether or not the intervention is found to improve student outcomes relative to the comparison condition. The Institute would consider methodologically successful projects to be *pragmatically successful* if the rigorous evaluation determined that the intervention has a net positive impact on student outcomes in relation to the program or practice to which it is being compared.

b. ***Requirements for proposed intervention***. Interventions appropriate for study under Goal Three are interventions that are fully developed and have evidence of their feasibility for use in authentic education delivery settings.

(i) Applicants must have an intervention that is fully developed and ready to be evaluated. Applicants who intend to devote a significant part of the project period to developing new components or materials for the intervention or new delivery approaches should apply to Goal Two. Goal Three projects are limited to those interventions that are fully developed.

Applicants must provide evidence that the intervention can be implemented in authentic education delivery settings – that is, evidence of the feasibility and usability of the proposed intervention in authentic education delivery settings. The interventions may already be in wide use in education setting or may be newly (but fully) developed interventions.

Also appropriate for Goal Three applications are proposals to *replicate* the efficacy of an intervention in a different setting. For instance, in a previous study, the applicant could have demonstrated the efficacy of an intervention in a small random assignment trial in an urban school district, and a reasonable next step would be to *replicate* these findings in a rural school district.

(ii) Applicants must provide a compelling rationale that justifies the Institute's investment in the evaluation of the proposed intervention. As justification for the evaluation of an intervention, the Institute will accept conceptual arguments of the importance of evaluating the proposed intervention because of its relevance to public policy or current education practice as would be judged by practitioners and policymakers. For example, the proposed intervention may already be widely used but have not been rigorously evaluated (e.g., a commercially distributed program, a specific education policy). To support this argument, applicants might include documentation of the widespread use (e.g., across multiple states, or a single large state) of the program to justify the proposed efficacy evaluation.

Alternatively, applicants could provide a strong rationale justifying the investment in the evaluation of the proposed intervention based on (a) the theoretical foundation on which the

intervention was developed; (b) research on related interventions or components of the proposed interventions; and/or (c) empirical evidence of the effect or potential effect of the proposed intervention based on smaller scale studies. In such cases, the applicant needs to address the question: Why is this intervention likely to produce better student outcomes relative to current practice? In addition, such applicants should address the *practical* importance of the proposed intervention. For example, is the intervention sufficiently comprehensive to improve student outcomes on end-of-year assessments? Is there evidence indicating that the proposed intervention is sufficiently different from current practices to potentially improve student outcomes relative to current practices?

(iv) Applicants should clearly describe a logic model for the proposed intervention (e.g., describing the features or components of the intervention and how they relate to each other and to the intended outcomes both temporally (or operationally) and theoretically (e.g., why A leads to B)). When applicants clearly describe the model that guides the intervention and the intervention itself (e.g., specific features or components of the intervention), reviewers are better able to evaluate the relation between the theoretical and empirical foundation for the intervention and the intervention (e.g., is the proposed intervention a reasonable operationalization of the theory?). Reviewers are also better able to evaluate the relation between the intervention and the outcome measures (e.g., do the proposed measures tap the constructs that the intervention is intended to address?).

Some interventions are designed to affect the teaching and learning environment and indirectly affect student outcomes. In such cases, it is important for applicants to be clear in their logic model of the mediators that the intervention is designed to affect and through which student outcomes are intended to be improved.

Strong applications will also include detailed descriptions of what the comparison group experiences. By clearly describing the intervention and the comparable treatment that the comparison group will receive, reviewers are better able to judge whether: (a) the intervention is sufficiently different from the comparison treatment so that one might reasonably expect a difference in student outcomes, and (b) fidelity measures and observations of the comparison group are sufficiently comprehensive and sensitive to identify and document critical differences between what the intervention and comparison groups receive.

By describing (a) the intervention (e.g., features, components) and the logic model for the intervention, (b) the theoretical and empirical support for the proposed intervention, and (c) the practical importance of the intervention, Goal Three applicants are addressing aspects of the significance of their proposal.

c. *Methodological requirements*. Under Goal Three, the proposed research design must be appropriate for answering the research questions or hypotheses that are posed.

(i) *Research questions*. Applicants should pose clear, concise hypotheses or research questions.

(ii) *Sample*. The applicant should define, as completely as possible, the sample to be selected and sampling procedures to be employed for the proposed study, including justification for exclusion and inclusion criteria. Additionally, the applicant should describe strategies to increase the

likelihood that participants will remain in the study over the course of the evaluation (i.e., reduce attrition).

(iii) *Research design*. The applicant must provide a detailed research design. Applicants should describe how potential threats to internal and external validity would be addressed. Studies using randomized assignment to treatment and comparison conditions are strongly preferred. When a randomized trial is used, the applicant should clearly state the unit of randomization (e.g., students, classroom, teacher, or school); choice of randomizing unit or units should be grounded in a theoretical framework. Applicants should explain the procedures for assignment of groups (e.g., schools) or participants to treatment and comparison conditions.[3]

Only in circumstances in which a randomized trial is not possible may alternatives that substantially minimize selection bias or allow it to be modeled be employed. Applicants proposing to use a design other than a randomized design must make a compelling case that randomization is not possible. Acceptable alternatives include appropriately structured regression-discontinuity designs or other well-designed quasi-experimental designs that come close to true experiments in minimizing the effects of selection bias on estimates of effect size. A well-designed quasi-experiment is one that reduces substantially the potential influence of selection bias on membership in the intervention or comparison group. This involves demonstrating equivalence between the intervention and comparison groups at program entry on the variables that are to be measured as program outcomes (e.g., student achievement scores), or obtaining such equivalence through statistical procedures such as propensity score balancing or regression. It also involves demonstrating equivalence or removing statistically the effects of other variables on which the groups may differ and that may affect intended outcomes of the program being evaluated (e.g., demographic variables, experience and level of training of teachers, motivation of students). Finally, it involves a design for the initial selection of the intervention and comparison groups that minimizes selection bias or allows it to be modeled. For example, a very weak quasi-experimental design that would *not* be acceptable as evidence of program efficacy would populate the intervention condition with teachers who volunteered for the program to be evaluated, and would select comparison teachers who had the opportunity to volunteer but did not. In contrast, an acceptable design would select teachers in one particular geographical area of a city to be in the intervention, whereas teachers in another geographical area, known to be demographically similar, would be selected to be in the comparison condition. In the former case, self-selection into the intervention is very likely to reflect motivation and other factors that will affect outcomes of interest and that will be impossible to equate across the two groups. In the latter case, the geographical differences between the participants in the two groups would ideally be unrelated to outcomes of interest, and in any case, could be measured and controlled for statistically.

(iv) *Power*. Applicants should clearly address the power of the evaluation design to detect a reasonably expected and minimally important effect. When applicants justify what constitutes a

---

[3] For additional information on describing procedures for randomization, see the What Works Clearinghouse document, *Evidence Standards for Reviewing Studies* (p. 6), available at http://www.whatworks.ed.gov/reviewprocess/study_standards_final.pdf.

reasonably expected effect, applicants should indicate clearly (e.g., including the statistical formula) how the effect size was calculated.

Many evaluations of education interventions are designed so that clusters or groups of students, rather than individual students, are randomly assigned to treatment and comparison conditions. In such cases, the power of the design depends in part on the degree to which the observations of individuals within groups are correlated with each other on the outcomes of interest. For determining the sample size, applicants need to consider the number of clusters, the number of individuals within clusters, the potential adjustment from covariates, the desired effect, the intraclass correlation (i.e., the variance between clusters relative to the total variance between and within clusters), and the desired power of the design (note, other factors may also affect the determination of sample size, such as using one-tailed vs. two-tailed tests, repeated observations, attrition of participants, etc.).[4] Strong applications will include empirical justification for the intraclass correlation and anticipated effect size used in the power analysis.

(v) *Measures*. Measures of student outcomes should include relevant standardized measures of student achievement in addition to other measures of student learning and achievement that are more closely aligned with the proposed intervention (e.g., researcher-developed measures). The applicant should provide information on the reliability, validity, and appropriateness of proposed measures. In strong applications, investigators will make clear that the skills or content the intervention is designed to address are captured in the various measures that are proposed.

Some interventions are designed to change directly the teaching and learning environment and indirectly affect student outcomes. In such cases, applicants should provide measures of the primary mediators (i.e., proximal outcomes), as well as measures of student outcomes.

(vi) *Fidelity of implementation of the intervention*. The applicant should specify how the implementation of the intervention would be documented and measured. In strong applications, investigators will make clear how the fidelity measures capture the critical features of the intervention. Investigators should propose research designs that permit the identification and assessment of factors impacting the fidelity of implementation.

(vii) *Comparison group, where applicable*. Comparisons of interventions against other conditions are only meaningful to the extent that one can tell what comparison group receives or experiences. Applicants should compare intervention and comparison groups on the implementation of critical features of the intervention so that, for example, if there is no observed difference between intervention and comparison student outcomes, they can determine if key elements of the intervention were also provided in the comparison condition (i.e., a lack of distinction between the intervention treatment and the comparison treatment).

---

[4] For more information, see Donner, A., & Klar, N. (2000). *Design and Analysis of Cluster Randomization Trials in Health Research*. New York: Oxford University Press; Murray, D. M. (1998). *Design and Analysis of Group-Randomized Trials*. New York: Oxford University Press; W.T. Grant Foundation & University of Michigan, http://sitemaker.umich.edu/group-based/optimal_design_software.

In evaluations of education interventions, individuals in the comparison group typically receive some kind of treatment; rarely is the comparison group a "no-treatment" control. For some evaluations, the primary question is whether the treatment is more effective than a particular alternative treatment. In such instances, the comparison group receives a well-defined treatment that is usually an important comparison to the target intervention for theoretical or pragmatic reasons. In other cases, the primary question is whether the treatment is more effective than what is generally available and utilized in schools. In such cases, the comparison group might receive what is sometimes called "business-as-usual." That is, the comparison group receives whatever the school or district is currently using or doing in a particular area. Business-as-usual generally refers to situations in which the standard or frequent practice across the nation is a relatively undefined education treatment. However, business-as-usual may also refer to situations in which a branded intervention (e.g., a published curriculum or program) is implemented with no more support from the developers of the program than would be available under normal conditions. In either case, *using a business-as-usual comparison group is acceptable.* When business-as-usual is one or another branded intervention, applicants should specify the treatment or treatments received in the comparison group. In all cases, applicants should account for the ways in which what happens in the comparison group are important to understanding the net impact of the experimental treatment. As noted in the preceding paragraph, in strong applications, investigators propose strategies and measures for comparing the intervention and comparison groups on key features of the intervention.

The purpose here is to obtain information useful for *post hoc* explanations of why the experimental treatment does or does not improve student learning relative to the counterfactual.

Finally, the applicant should describe strategies they intend to use to avoid contamination between treatment and comparison groups. Applicants do not necessarily need to randomize at the school level to avoid contamination between groups. Applicants should explain and justify their strategies for reducing contamination.

(viii) *Mediating and moderating variables*. Observational, survey, or qualitative methodologies are encouraged as a complement to experimental methodologies to assist in the identification of factors that may explain the effectiveness or ineffectiveness of the intervention. Mediating and moderating variables that are measured in the intervention condition that are also likely to affect outcomes in the comparison condition should be measured in the comparison condition (e.g., student time-on-task, teacher experience/time in position).

The evaluation should be designed to account for sources of variation in outcomes across settings (i.e., to account for what might otherwise be part of the error variance). Applicants should provide a theoretical rationale to justify the inclusion (or exclusion) of factors/variables in the design of the evaluation that have been found to affect the success of education programs (e.g., teacher experience, fidelity of implementation, characteristics of the student population). The research should demonstrate the conditions and critical variables that affect the success of a given intervention. The most scalable interventions are those that can produce the desired effects across a range of education contexts.

(ix) *Data analysis*. All proposals must include detailed descriptions of data analysis procedures. For quantitative data, specific statistical procedures should be described. The relation between hypotheses, measures, independent and dependent variables should be clear. For qualitative data, the specific methods used to index, summarize, and interpret data should be delineated.

Most evaluations of education interventions involve clustering of students in classes and schools and require the effects of such clustering to be accounted for in the analyses, even when individuals are randomly assigned to condition. Such circumstances generally require specialized multilevel statistical analyses using computer programs designed for such purposes. Strong applications will provide sufficient detail for reviewers to judge the appropriateness of the data analysis strategy. For random assignment studies, applicants need to be aware that typically the primary unit of analysis is the unit of random assignment.

d. ***Personnel and resources.*** Competitive applicants will have research teams that collectively demonstrate expertise in: (a) the relevant content area (e.g., reading, mathematics, student behaviors); (b) the type of intervention being evaluated (e.g., curriculum, teacher professional development, policy); (c) implementation of, and analysis of results from, the research design that will be employed; and (d) working with schools and other education delivery settings. Competitive applicants will have access to institutional resources that adequately support research.

For Goal Three projects, an applicant may be or may involve developers or distributors (*including for-profit entities*) in the project, from having them as full partners in its proposal to using off-the-shelf training materials without involvement of the developer or distributor. Involvement of the developer or distributor must not jeopardize the objectivity of the evaluation. *Collaborations including for-profit distributors of curriculum materials should justify the need for Federal assistance to undertake the evaluation of programs that are marketed to consumers and consider sharing the cost of the evaluation.*

Competitive applicants will have access to institutional resources that adequately support research activities and access to schools in which to conduct the research. Strong applications will document the availability and cooperation of the schools or other education delivery settings that will be required to carry out the research proposed in the application via a letter of support from the education organization.

e. ***Awards***. Typical awards for projects at this level will be $250,000 to $750,000 (total cost = direct + indirect costs) per year for a maximum of 4 years. Larger budgets will be considered if a compelling case can be made for such support. The size of the award depends on the scope of the project.

E. Requirements for Goal Four (Scale-up Evaluations)
Because the requirements for Goal Four are essentially the same across the Institute's research grant topics, a generic description is used in the funding announcement. Consequently, the examples provided may not apply to a particular topic.

a. ***Purpose of scale-up evaluations***. Through all of its research programs that include the Scale-up Evaluations goal (Goal Four), the Institute intends to support effectiveness evaluations of interventions - programs, practices - 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 (i.e., without special support from the developer or the research team)

across a variety of conditions (e.g., different student populations, different types of schools). The key differences between Scale-up Evaluations (Goal Four) and Efficacy Evaluations (Goal Three), as the Institute uses these terms, have to do with the delivery of the intervention and the diversity of the sample. Scale-up Evaluations require that intervention be implemented at a distance from the researcher/developer of the intervention. That is, the researchers must not be heavily involved in making the intervention work. The intervention must be implemented in the school or other authentic education setting, as it would be if the school, or entity, had purchased and implemented the intervention on its own without any involvement in a research study. Second, Scale-up Evaluations require sufficient diversity in the sample of schools, classrooms, or students to ensure appropriate generalizability. Scale-up Evaluations typically require a larger sample than an Efficacy Evaluation. For Scale-up Evaluations, the primary question of interest is, "Does this intervention produce a net positive increase in student learning and achievement relative to the control group?" As is true for Goal Three studies, for Goal Four studies, depending on the research question of interest, the control group may receive a well-defined alternative treatment, or may receive whatever programs and practices are already currently available and utilized by schools (business-as-usual control group). Finally, the Institute invests in Scale-up Evaluations for interventions that have strong prior evidence of the efficacy of the intervention.

b. ***Requirements for proposed intervention***. To be considered for Goal Four awards, applicants must provide a clear rationale for the *practical* importance of the intervention. Applicants should address three questions related to practical importance. (i) Is the intervention likely to produce educationally meaningful effects on outcomes that are important to educational achievement (e.g., grades, achievement test scores) and, therefore, are of interest to parents, teachers, and education decision makers? (ii) Is the intervention reasonably affordable to schools and other education delivery entities? (iii) Is the intervention designed so that it is feasible for schools and other education delivery entities to implement the intervention? In addition, applicants should clearly describe the components of the intervention. Interventions appropriate for study under Goal Four are interventions that are fully developed and have strong evidence of the efficacy of the program on a limited scale.

(i) *Educationally meaningful effects*. Applicants must provide *strong* evidence of the efficacy of the program as implemented on a small scale to justify the proposal to conduct a large-scale evaluation of the effectiveness of the intervention. As an example of strong evidence of efficacy, an applicant might describe the results of two or more small scale, rigorously conducted evaluations using random assignment to intervention and comparison conditions in which the efficacy of the intervention is demonstrated with different populations (e.g., urban and rural school districts). Alternatively, a single efficacy evaluation might have involved schools from more than one district and included a diverse population of teachers and students and alone could constitute sufficient evidence of the efficacy of the intervention. Importantly, the evidence of efficacy must be based on the results of randomized field trials, or well-designed quasi-experimental evaluations. Strong applications will include information on the size and statistical significance of the effects that were obtained through efficacy trials. Effect sizes and confidence limits should typically be calculated based on a unit of analysis that is the same as the unit of random assignment. For example, the results of an efficacy trial in which classrooms were assigned to conditions should be analyzed based on classroom means rather than results from individual students. Applicants should indicate clearly (e.g., including the statistical formula) how the effect size was calculated when they use effect sizes as part of the rationale for

justifying their intervention. Furthermore, information on effect sizes is more useful to reviewers when sufficient context for interpreting the effect sizes is provided.

(ii) *Feasible implementation*. The materials, training procedures, organizational arrangements, and all other aspects of the intervention must be developed to the point where the intervention is ready to be implemented under real-world circumstances in a real-world way. Strong applications will provide reviewers with sufficient information to evaluate whether implementation of the intervention is feasible for schools and other education entities under normal conditions (i.e., without any support from the researchers or developers of the intervention that would not typically be available to entities wanting to implement the intervention outside of a research study). For example, applicants might include results from prior efficacy trials indicating the degree of support provided for the implementation of the intervention and the level of fidelity attained across classrooms or schools.

(iii) *Description of the intervention*. All applicants should clearly describe the intervention (e.g., features, components). When applicants clearly describe the intervention, reviewers are better able to evaluate the relation between the intervention and the outcome measures (e.g., do the proposed measures tap the constructs that the intervention is intended to address?). Strong applications will also include detailed descriptions of what the comparison group experiences. By clearly describing the components of the intervention and the comparable treatment (e.g., training program) that the comparison group will receive, reviewers are better able to judge whether (a) the intervention is sufficiently different from the comparison treatment so that one might reasonably expect a difference in student outcomes, and (b) fidelity measures and observations of the comparison group are sufficiently comprehensive and sensitive to identify and document critical differences between the intervention and comparison conditions.

c. ***Implementation of the intervention***. One goal of scale-up evaluations of interventions is to determine if programs are effective when the developers of the program do not provide any more support than would be available under normal conditions. That is, the program should be implemented as it would be if the schools or other entities that are delivering the program were to obtain the program on their own and decide to use it apart from participation in any research and evaluation study. A second goal is to determine if programs implemented under these conditions are effective in a variety of settings. Interventions that are effective at scale are those that can produce the desired effects across a range of education contexts. For Goal Four, the applicant should detail the conditions under which the intervention will be implemented – including explicitly detailing what involvement the researcher/developer will have in the implementation of the intervention and justifying this level of involvement – and provide procedures that will capture the conditions and critical variables that affect the success of a given intervention.

By addressing the implementation of the intervention and the requirements for the intervention in section 14.E.b, Goal Four applicants are addressing the significance of their proposal.

d. ***Methodological requirements***. **Under Goal Four, the proposed research design must be appropriate for answering the research questions or hypotheses that are posed.** For the methodological requirements for Goal Four projects, please refer to the methodological requirements listed under Goal Three.

In addition, to the methodological requirements listed under Goal Three, for Goal Four projects, strong applications will include a Cost-Feasibility analysis to assess the financial costs of program implementation and assist schools in understanding whether implementation of the program is practicable given their available resources. Data should be collected on the monetary expenditures for the resources that are required to implement the program. Financial costs for personnel, facilities, equipment, materials, and other relevant inputs should be included. Annual costs should be assessed to adequately reflect expenditures across the lifespan of the program. The Institute is *not* asking applicants to conduct an economic evaluation of the program (e.g., cost-benefit, cost-utility, or cost-effectiveness analyses), although applicants may propose such evaluation activities if desired.[5]

e. ***Personnel and resources***. Competitive applicants will have research teams that collectively demonstrate expertise in: (a) the relevant content area (e.g., reading, mathematics, student behaviors); (b) the type of intervention proposed (e.g., program, practice, policy); (c) implementation of, and analysis of results from, the research design that will be employed; and (d) working with schools and other education delivery settings.

Competitive applicants will have access to institutional resources that adequately support research activities and access to schools in which to conduct the research. Strong applications will document the availability and cooperation of the schools or other education delivery settings that will be required to carry out the research proposed in the application via a letter of support from the education organization.

An applicant may involve developers or distributors (*including for-profit entities*) of the intervention in the project, from having the developers as full partners in its proposal to using off-the-shelf teacher training materials without involvement of the developer or publisher. However, involvement of the developer or distributor must not jeopardize the objectivity of the evaluation. Strong applications will carefully describe the role, if any, of the developer/distributor in the intervention. Developers may not provide any training or support for the implementation that is not normally available to users of the intervention. Applicants should describe how objectivity in the evaluation would be maintained. Strong applications will assign responsibility for random assignment to condition and data analyses to individuals who are *not* part of the organization that developed or distributes the intervention.

Collaborations including for-profit distributors of materials should justify the need for Federal assistance to undertake the evaluation of programs that are marketed to consumers and consider sharing the cost of the evaluation.

f. ***Awards***. The scope of Goal Four projects may vary. A smaller project might involve several schools within a large urban school district in which student populations vary in terms of SES, race, and ethnicity. A larger project might involve large numbers of students in several school districts in different geographical areas.

---

[5] For additional information on how to calculate the costs of a program or conduct an economic evaluation, applicants might refer to Levin, H.M., & McEwan, P.J. (2001). *Cost-Effectiveness Analysis*. 2nd Ed. Thousand Oaks, CA: Sage Publications.

Awards for Goal Four projects may go up to a limit of $6,000,000 (total cost = direct + indirect costs) over a 5-year period. Typical awards are less. Awards depend in part on the number of sites, cost of data collection, and cost of implementation. The size of the award depends on the scope of the project.

F. Requirements for Goal Five (Measurement Projects for Topics 1-3, 6-7, 10-13)
In Section 14.F, the Institute specifies the requirements for Goal Five projects for the following topics: (Topic 1) Reading and Writing; (Topic 2) Mathematics and Science Education; (Topic 3) Cognition and Student Learning; (Topic 6) Social and Behavioral Context for Academic Learning; (Topic 7) Education Leadership; (Topic 10) High School Reform; (Topic 11) Interventions for Struggling Adolescent and Adult Readers and Writers; (Topic 12) Postsecondary Education; and (Topic 13) Education Technology.

a. ***Requirements of proposed assessments***. Applicants under Goal Five should propose to develop assessments that can be used in education delivery settings. Applications that would be appropriate for consideration under Goal Five include, but are not limited to: (a) proposals to develop new assessments; (b) proposals to modify or adapt existing assessments; and (c) proposals to adapt assessments originally designed and used for research purposes for broader use in instructional settings.

Applicants should provide a compelling rationale to support the development of the proposed assessment. Reviewers will consider (a) the strength of the theoretical foundation for the proposed assessment, (b) the existing empirical evidence supporting the proposed assessment, and (c) whether the proposed assessment duplicates existing assessments. Applicants should clearly describe (1) the construct(s) to be measured, and (2) the dimensions or components of the construct(s) to be measured. Applicants should clearly describe the components of the assessment instrument and their relation to the target construct(s). When applicants clearly describe the components of the assessment, reviewers are better able to evaluate the relation between the theoretical and empirical foundation for the assessment and the assessment itself (e.g., does the proposed assessment capture critical skills?), and whether the proposed assessment will meet the needs for which it is intended.

In developing these assessments, researchers should keep in mind the pragmatic constraints (e.g., number of students, limited class time, time required to train teachers to use the assessments, costs) that teachers and administrators will consider to determine whether the instrument is a viable option for use in classrooms and other education delivery settings. Applications should provide sufficient description of the proposed assessment, and how it could be utilized within education delivery settings for reviewers to judge the practicality of the proposed assessment for instructional purposes.

By describing the theoretical and empirical support for the proposed assessment, the practical utility of the assessment, and the components of the assessment, applicants are addressing aspects of the significance of their proposal.

b. ***Methodological requirements.*** There are two aspects of the research methodology that applicants must clearly address: (a) the proposed methods for developing the assessment, and (b) the proposed research methods for obtaining evidence of the *validity and reliability* of the instrument.

(i) *Assessment development*. Applicants must detail the proposed procedures for developing the assessment. Strong applications will include descriptions of: (a) the procedures for determining the constructs that will be "tapped" by the instrument; (b) the procedures for selecting items to be

used in the assessment, including assessing difficulty of selected items, and obtaining representative responses to items; and (c) the process for determining the administrative procedures for conducting the assessment (e.g., mode of administration, inclusion/exclusion of individual test takers, and whether make-ups or alternative administrative conditions will be allowed). Applicants should describe the process they will use to collect empirical data that will provide feedback for refining specific components of the assessment. *Applicants should describe the iterative development process to be used in the design and refinement of the proposed measurement tool.*

(ii) *Assessment evaluation*. Applicants must clearly describe the research plans for determining the validity and reliability of the instrument. Applicants should describe the characteristics, size, and analytic adequacy of samples to be used in each study, including justification for exclusion and inclusion criteria. Applicants should describe detailed planned analytic methods (e.g., statistical and/or psychometric models), plans for treatment of missing responses, and criteria for interpreting results.

c. ***Personnel and resources.*** Competitive applicants will have research teams that collectively demonstrate expertise in: (a) the target domain (e.g., reading, mathematics, behaviors); (b) assessment; (c) implementation of, and analysis of results from, the research design that will be employed; and (d) working with teachers, schools, or other education delivery settings in which the proposed assessment might be used. Competitive applicants will have access to institutional resources that adequately support research activities and access to schools in which to conduct the research.

d. ***Awards.*** Typical awards under Goal Five will be $150,000 to $400,000 (total cost = direct + indirect costs) per year for up to 4 years. Larger budgets will be considered if a compelling case can be made for such support. The size of award depends on the scope of the project.

PART IV. GENERAL SUBMISSION AND REVIEW INFORMATION

15. APPLICATIONS AVAILABLE

Application forms and instructions for the electronic submission of applications will be available for the programs of research listed in this RFA from the following web site:

http://www.Grants.gov

by the following dates:

July 26, 2007 Application Deadline Date	April 23, 2007
November 1, 2007 Application Deadline Date	April 30, 2007

The application form approved for use in the competitions specified in this RFA is the government-wide SF424 Research and Related (R&R) Form (OMB Number 4040-0001).

16. MECHANISM OF SUPPORT

The Institute intends to award grants pursuant to this request for applications. The maximum length of the award period varies by topic and within topic by goal. The maximum award length for each goal within a specific topic is specified in the award section for that topic and goal and ranges from two to five years. Please see details for each topic and goal in the Requirements of the Proposed Research section of the announcement.

17. FUNDING AVAILABLE

The size of the award depends on the scope of the project. Please see specific details in the Requirements of the Proposed Research section of the announcement. Although the plans of the Institute include the research programs (topics) described in this announcement, awards pursuant to this request for applications are contingent upon the availability of funds and the receipt of a sufficient number of meritorious applications. The number of projects funded under a specific topic and goal depends upon the number of high quality applications submitted to that topic and goal. The Institute does not have plans to award a specific number of grants under each particular topic and goal.

18. ELIGIBLE APPLICANTS

For the research grant topics, applicants that have the ability and capacity to conduct scientifically valid research are eligible to apply. Eligible applicants include, but are not limited to, non-profit and for-profit organizations and public and private agencies and institutions, such as colleges and universities.

19. SPECIAL REQUIREMENTS

Research supported through this program must be relevant to U.S. schools.

Recipients of awards are expected to publish or otherwise make publicly available the results of the work supported through this program. The Institute asks IES-funded investigators to submit voluntarily

to the Educational Resources Information Center (ERIC) an electronic version of the author's final manuscript upon acceptance for publication in a peer-reviewed journal, resulting from research supported in whole or in part, with direct costs from the Institute. The author's final manuscript is defined as the final version accepted for journal publication, and includes all modifications from the peer review process.

Applicants should budget for one meeting each year in Washington, DC, with other grantees and Institute staff. At least one project representative should attend the two-day meeting.

The Institute anticipates that the majority of the research funded under this announcement will be conducted in field settings. Hence, the applicant is reminded to apply its negotiated off-campus indirect cost rate, as directed by the terms of the applicant's negotiated agreement.

Research applicants may collaborate with, or be, for-profit entities that develop, distribute, or otherwise market products or services that can be used as interventions or components of interventions in the proposed research activities. Involvement of the developer or distributor must not jeopardize the objectivity of the evaluation. Applications from, or collaborations including, such organizations should justify the need for Federal assistance to undertake the evaluation of programs that are marketed to consumers and consider sharing the cost of the evaluation, as well as sharing all or a substantial portion of the cost of the implementation of the product being evaluated (e.g., sharing the cost of textbooks for students).

The Institute strongly advises applicants to establish a written agreement among all key collaborators and their institutions (e.g., principal and co-principal investigators) regarding roles, responsibilities, access to data, publication rights, and decision-making procedures within 3 months of receipt of an award.

20. LETTER OF INTENT

A letter indicating an applicant's intent to submit an application is optional, but encouraged, for each application. The letter of intent form must be submitted electronically by the date listed at the beginning of this document, using the instructions provided at: https://ies.constellagroup.com.

The letter of intent should include:

- Descriptive title;
- Topic and goal that the applicant will address;
- Brief description of the proposed project;
- Name, institutional affiliation, address, telephone number and e-mail address of the principal investigator(s);
- Name and institutional affiliation of any key collaborators and contractors;
- Duration of the proposed project;
- Estimated budget request for each year; and
- Total budget request.

The project description should be single-spaced and should not exceed one page (about 3,500 characters). Although the letter of intent is optional, is not binding, and does not enter into the review of

a subsequent application, the information that it contains allows Institute staff to estimate the potential workload to plan the review.

21. SUBMITTING AN APPLICATION

Applications must be submitted **electronically by 4:30 p.m.**,**Washington, DC time** by the application deadline date, using the standard forms and the instructions provided at the following web site:

http://www.Grants.gov

Potential applicants should check this site for information about the electronic submission procedures that must be followed and the software that will be required.

22. CONTENTS OF APPLICATION

All applications and proposals for Institute funding must be contained within specified page limits. Internet Web site addresses (URLs) may not be used to provide information necessary to the review because reviewers are under no obligation to view the Internet sites.

All of the instructions and requirements regarding (a) submission of the application, (b) application page limits, (c) acceptable format, and (d) necessary attachments (.PDF files) will be provided in the **Application Instructions** document for this competition to be found under the "For Applicants -- Apply for Grants" link of Grants.gov. Also, all of the required forms will be provided in the **Application Package** that accompanies the Application Instructions.

You must search for the downloadable Application Instructions and Application Package for each competition by the CFDA number. Do not include the alpha suffix in your search (e.g., search for 84.305, not 84.305A). For this competition, make sure that you download the "Education Research" Application Instructions and Application Package.

In this section, the Institute provides instructions regarding the content of the (a) project summary/abstract, (b) project narrative, (c) bibliography and references cited, (d) biographical sketches of senior/key personnel, (e) narrative budget justification (f) subaward budgets, (g) Appendix A, (h) Appendix B, (i) human subjects narrative, and (j) additional forms. The instructions below will be reiterated in the Application Instructions document for this competition, which will be available, as noted above, under the "For Applicants -- Apply for Grants" link of Grants.gov.

A. Project Summary/Abstract

The project summary/abstract will be submitted as a .PDF attachment, is limited to 1 single-spaced page and must adhere to the margin, format, and font size requirements described in the project narrative section.

The project summary/abstract should include (1) the title of the project; (2) the RFA topic and goal under which the applicant is applying (e.g., development, efficacy); and brief descriptions of (3) the purpose (e.g., to develop and document the feasibility of an intervention); (4) the setting in which the research will be conducted (e.g., rural school districts in Alabama); (5) the population(s) from which the

participants of the study(ies) will be sampled (age groups, race/ethnicity, SES); (6) if applicable, the intervention or assessment to be developed or evaluated or validated; (7) if applicable, the control or comparison condition (e.g., what will participants in the control condition experience); (8) the primary research method; (9) if applicable, measures of key outcomes; and (10) if applicable, data analytic strategy.

B. Project Narrative

The project narrative will be submitted as a .PDF attachment. Incorporating the requirements outlined under the section on Requirements of the Proposed Research and the requirements listed under the Specific Requirements section of the relevant research grant topic, the *project narrative* provides the majority of the information on which reviewers will evaluate the proposal.

The project narrative must include the four sections described below (a. "Significance" through d. "Resources") in the order listed and must conform to the format requirements described on the application submission website.

The project narrative is limited to **25 single-spaced pages** for all applicants. This 25-page limit does not include any of the SF 424 forms, the one-page summary/abstract, the appendices, research on human subjects information, bibliography and references cited, biographical sketches of senior/key personnel, narrative budget justification, sub award budget information or certifications and assurances. **Reviewers are able to conduct the highest quality review when applications are concise and easy to read, with pages numbered consecutively**.

For the purposes of applications submitted under this RFA, a "page" is 8.5 in. x 11 in., on one side only, with 1 inch margins at the top, bottom, and both sides. Text must be single spaced in the narrative. To ensure that the text is easy for reviewers to read and that all applicants have the same amount of available space in which to describe their projects, applicants must adhere to the type size and format specifications for the entire narrative including footnotes**. It is very important that applicants review carefully the "Application Format Requirements" outlined in *Fiscal Year 2008 Application Package Highlights***, which will be part of the application instructions, available on http://www.Grants.gov by April 23, 2007.

a. ***Significance***. In the General Requirements of the Proposed Research section and in the subsections describing the requirements for the proposed intervention for Goal One, Goal Two, Goal Three, Goal Four, and Goal Five, the Institute details the information that the applicant should include in order to address the significance of the proposed project.

For projects in which an intervention or assessment is proposed (whether to be developed or to be evaluated), applicants may use Appendix B to include up to 10 pages of examples of materials to be used by participants (e.g., training materials for teachers, computer screens depicting how information is presented to students, examples of test items for a proposed assessment). Applicants should be aware that all narrative text describing the theoretical background, empirical support, components of the assessment or intervention, or any other aspect of the proposal must be included within the 25-page project narrative. The only materials that are allowed in Appendix B are examples of the materials that are used by or presented to participants in the intervention or assessment.

b. ***Methods.*** The Methods section of applications for Goal One, Goal Two, Goal Three, Goal Four, and Goal Five should address all of the requirements detailed in the methodological requirements sections for the appropriate research goal.

c. ***Personnel***. Applicants must include brief descriptions of the qualifications of key personnel (information on personnel should also be provided in their curriculum vitae) in the research narrative to be compliant with the requirements of the Request for Applications. For each of the key personnel, please describe the roles, responsibilities, and percent of time devoted to the project.

d. ***Resources.*** Applicants must include a brief description of resources available to support the project at the applicant's institution and in the field settings in which the research will be conducted in the research narrative to be compliant with the requirements of the Request for Applications.

C. Bibliography and References Cited
This section will be submitted as a .PDF attachment. Please include complete citations, including titles and all authors, for literature cited in the research narrative.

D. Biographical Sketches of Senior/Key Personnel
This section will be submitted as a .PDF attachment. Abbreviated curriculum vitae should be provided for the principal investigator(s) and other key personnel. *Each vita is limited to 4 pages and should include information sufficient to demonstrate that personnel possess training and expertise commensurate with their duties (e.g., publications, grants, relevant research experience), and have adequate time devoted to the project to carry out their duties. The fifth page of the attachment should list current and pending grants with the proportion of the individual's time allocated to each project.* The curriculum vita must adhere to the margin, format, and font size requirements described in the project narrative section.

E. Narrative Budget Justification
This section will be submitted as a .PDF attachment and should provide sufficient detail to allow reviewers to judge whether reasonable costs have been attributed to the project. The budget justification should correspond to the itemized breakdown of project costs that is provided in the Research & Related Budget (SF 424) Sections A & B; C, D, & E; and F-K. It should include the time commitments and brief descriptions of the responsibilities of key personnel. For consultants, the narrative should include the number of days of anticipated consultation, the expected rate of compensation, travel, per diem, and other related costs. A justification for equipment purchase, supplies, travel and other related project costs should also be provided in the budget narrative for each project year outlined in the Research & Related Budget (SF 424).

For those applications that include a subaward(s) for work conducted at collaborating institutions, the narrative should also provide the details about the subaward(s). Include the actual subaward budgets as a separate attachment. (See below "Subaward Budget".)

Applicants should use their institution's federal indirect cost rate and use the off-campus indirect cost rate where appropriate (see instructions under Section 19 Special Requirements). If less than 75 percent of total indirect costs are based on application of the off-campus rate, the applicant should provide a detailed justification.

F. Subaward Budget

This section will be submitted as a .PDF attachment. For applications that include a subaward(s) for work conducted at collaborating institutions, applicants must submit an itemized budget spreadsheet for each subaward for each project year. As noted above, the details of the subaward costs should be included in the Narrative Budget Justification. An Excel spreadsheet will be provided in the electronic application package to allow applicants to enter the subaward budget information in accordance with the prescribed format. Applicants will complete the spreadsheet in Excel format, convert it to a .PDF file, and then upload it as an attachment.

G. Appendix A

Appendix A should be included at the end of the Project Narrative, and will be submitted as part of the same .PDF attachment.

The purpose of A*ppendix A* is to allow the applicant to include any figures, charts, or tables that supplement the research text, examples of measures to be used in the project, and letters of agreement from partners (e.g., schools) and consultants. In addition, in the case of a resubmission, the applicant may use **up to 3 pages** of the appendix to describe the ways in which the revised proposal is responsive to prior reviewer feedback. These are the only materials that may be included in Appendix A; all other materials will be removed prior to review of the application. Narrative text related to any aspect of the project (e.g., descriptions of the proposed sample, the design of the study, or previous research conducted by the applicant) must be included in the research narrative. Letters of agreement should include enough information to make it clear that the author of the letter understands the nature of the commitment of time, space, and resources to the research project that will be required if the application is funded. The appendix is limited to 15 pages. The Institute recognizes that some applicants may have more letters of agreement than will be accommodated by the 15-page limit. In such instances, applicants should include the most important letters of agreement and may list the letters of agreement that are not included in the application due to page limitations.

H. Appendix B (optional)

If applicable, Appendix B should be included at the end of the Project Narrative, following Appendix A, and will be submitted as part of the same .PDF attachment.

The purpose of Appendix B is to allow applicants who are proposing an intervention or assessment to include examples of curriculum material, computer screens, test items, or other materials used in the intervention or assessment. These are the only materials that may be included in Appendix B; all other materials will be removed prior to review of the application. Appendix B is limited to 10 pages. Narrative text related to the intervention (e.g., descriptions of research that supports the use of the intervention/assessment, the theoretical rationale for the intervention/assessment, or details regarding the implementation or use of the intervention/assessment) must be included in the 25-page research narrative.

I. Research on Human Subjects

This section will be submitted as a .PDF attachment. If an applicant proposes research activities involving human subjects at any time during the proposed project period, either at the applicant organization or at any other performance site or collaborating institution, then the applicant must provide either a human subjects "exempt research narrative" or a "nonexempt research narrative" and upload this narrative as instructed in the ***Fiscal Year 2008 Application Package Highlights***. See the U.S. Department of Education's web page for detailed information about the protection of human subjects in research:
http://www.ed.gov/policy/fund/guid/humansub/overview.html

J. Additional Forms

Please note that applicants selected for funding will be required to submit the following certifications and assurances before a grant is issued:

(1) SF 424B-Assurances-Non-Construction Programs
(2) Grants.gov Lobbying Form
(3) ED 80-0014 (if applicable)-Lower Tier Certification
(4) SF-LLL (if applicable) - Disclosure of Lobbying Activities
(5) Protection of Human Research Subjects assurance and/or Institutional Review Board certification, as appropriate

23. APPLICATION PROCESSING

Applications must be received by **4:30 p.m. Washington, DC time** on the application deadline date listed in the heading of this request for applications. Upon receipt, each application will be reviewed for compliance and for responsiveness to this request for applications. Applications that do not address specific requirements of this request will be returned to the applicants without further consideration.

24. PEER REVIEW PROCESS

Applications that are compliant and responsive to this request will be evaluated for scientific and technical merit. Reviews will be conducted in accordance with the review criteria stated below by a panel of scientists who have substantive and methodological expertise appropriate to the program of research and request for applications.

Each application will be assigned to one of the Institute's scientific review panels. At least two primary reviewers will complete written evaluations of the application, identifying strengths and weaknesses related to each of the review criteria. Primary reviewers will independently assign a score for each criterion, as well as an overall score, for each application they review. Based on the overall scores assigned by primary reviewers, an average overall score for each application will be calculated and a preliminary rank order of applications prepared before the full peer review panel convenes to complete the review of applications.

The full panel will consider and score only those applications deemed to be the most competitive and to have the highest merit, as reflected by the preliminary rank order. A panel member may nominate for consideration by the full panel any proposal that he or she believes merits full panel review but would not have been included in the full panel meeting based on its preliminary rank order.

25. REVIEW CRITERIA FOR SCIENTIFIC MERIT

The purpose of Institute-supported research is to contribute to the solution of education problems and to provide reliable information about the education practices that support learning and improve academic achievement and access to education for all students. Reviewers for all applications will be expected to assess the following aspects of an application in order to judge the likelihood that the proposed research will have a substantial impact on the pursuit of that goal. Information pertinent to each of these criteria is also described above in the section on Requirements of the Proposed Research, in the Specific Requirements section of the relevant research grant topic, and in the description of the project narrative, which appears in the section on Contents of Application.

A. Significance

For significance of the project, Goal One applicants need to address the theoretical and empirical rationale for the study and the practical importance of the intervention (e.g., program, practice) that will be examined issues, as outlined in section III.14.B.a (Purpose of identification studies).

For significance of the project, Goal Two and Goal Three applicants need to describe (a) the intervention (e.g., features, components) and the logic model for the intervention, (b) the theoretical and empirical support for the proposed intervention, and (c) the practical importance of the intervention, as detailed in section III.14.C.b (for Goal Two: Requirements for proposed intervention.) and in section III.14.D.b for Goal Three.

For significance of the project, Goal Four applicants need to address the implementation of the intervention as discussed in section III.14.E.c and the requirements for the intervention in section III.14.E.b.

For significance of the project, Goal Five applicants need to describe the theoretical and empirical support for the proposed assessment, the practical utility of the assessment, and the components of the assessment.

B. Research Plan

Does the applicant address the requirements described in the methodological requirements section for the Goal under which the applicant is submitting the proposal?

C. Personnel

Does the description of the personnel make it apparent that the principal investigator, project director, and other key personnel possess the training and experience and will commit sufficient time to competently implement the proposed research?

D. Resources

Does the applicant have the facilities, equipment, supplies, and other resources required to support the proposed activities? Do the commitments of each partner show support for the implementation and success of the project?

26. RECEIPT AND START DATE SCHEDULE

A. Letter of Intent Receipt Dates:

July 26, 2007 Application Deadline Date	May 24, 2007
November 1, 2007 Application Deadline Date	September 6, 2007

B. Application Deadlines:

Summer Deadline Date	July 26, 2007
Fall Deadline Date	November 1, 2007

C. Earliest Anticipated Start Date:

July 26, 2007 Application Deadline Date	March, 2008
November 1, 2007 Application Deadline Date	July, 2008

27. AWARD DECISIONS

The following will be considered in making award decisions:

- Scientific merit as determined by peer review
- Responsiveness to the requirements of this request
- Performance and use of funds under a previous Federal award
- Contribution to the overall program of research described in this request
- Availability of funds

28. INQUIRIES MAY BE SENT TO

For the convenience of applicants, in this section we provide contact information for all of the NCER research programs.

A. Reading and Writing

Dr. Elizabeth Albro
Institute of Education Sciences
555 New Jersey Avenue, NW
Washington, DC 20208

Email: Elizabeth.Albro@ed.gov
Telephone: (202) 219-2148

B. Mathematics and Science Education

Dr. Christina Chhin
Institute of Education Sciences
555 New Jersey Avenue, NW
Washington, DC 20208

Email: Christina.Chhin@ed.gov
Telephone: (202) 219-2280

C. Cognition and Student Learning

Dr. Carol O'Donnell
Institute of Education Sciences
555 New Jersey Avenue, NW
Washington, DC 20208

Email: Carol.O'Donnell@ed.gov
Telephone: (202) 208-3749

D. Teacher Quality (Reading and Writing and Mathematics and Science Education)

Dr. Harold Himmelfarb
Institute of Education Sciences
555 New Jersey Avenue, NW
Washington, DC 20208

Email: Harold.Himmelfarb@ed.gov
Telephone: (202) 219-2031

E. Social and Behavioral Context for Academic Learning

Dr. Christina Chhin
Institute of Education Sciences
555 New Jersey Avenue, NW
Washington, DC 20208

Email: Christina.Chhin@ed.gov
Telephone: (202) 219-2280

F. Education Leadership

Dr. Katina Stapleton
Institute of Education Sciences
555 New Jersey Avenue, NW
Washington, DC 20208

Email: Katina.Stapleton@ed.gov
Telephone: (202) 219-2154

G. Education Policy, Finance, and Systems

Dr. Katina Stapleton
Institute of Education Sciences
555 New Jersey Avenue, NW
Washington, DC 20208

Email: Katina.Stapleton@ed.gov
Telephone: (202) 219-2154

H. Early Childhood Programs and Policies

Dr. Caroline Ebanks
Institute of Education Sciences
555 New Jersey Avenue, NW
Washington, DC 20208

Email: Caroline.Ebanks@ed.gov
Telephone: (202) 219-1401

I. High School Reform

Dr. David Sweet
Institute of Education Sciences
555 New Jersey Avenue, NW
Washington, DC 20208

Email: David.Sweet@ed.gov
Telephone: (202) 219-1748

J. Interventions for Struggling Adolescent and Adult Readers

Dr. Elizabeth Albro
Institute of Education Sciences
555 New Jersey Avenue, NW
Washington, DC 20208

Email: Elizabeth.Albro@ed.gov
Telephone: (202) 219-2148

K. Postsecondary Education

Dr. Ram Singh
Institute of Education Sciences
555 New Jersey Avenue, NW
Washington, DC 20208

Email: Ram.Singh@ed.gov
Telephone: (202) 219-2025

L. Education Technology

Dr. Edward Metz
Institute of Education Sciences
555 New Jersey Avenue, NW
Washington, DC 20208

Email: Edward.Metz@ed.gov
Telephone: (202) 208-1983

29. PROGRAM AUTHORITY

20 U.S.C. 9501 et seq., the "Education Sciences Reform Act of 2002," Title I of Public Law 107-279, November 5, 2002. This program is not subject to the intergovernmental review requirements of Executive Order 12372.

30. APPLICABLE REGULATIONS

The Education Department General Administrative Regulations (EDGAR) in 34 CFR parts 74, 77, 80, 81, 82, 84, 85, 86 (part 86 applies only to institutions of higher education), 97, 98, and 99. In addition 34 CFR part 75 is applicable, except for the provisions in 34 CFR 75.100, 75.101(b), 75.102, 75.103, 75.105, 75.109(a), 75.200, 75.201, 75.209, 75.210, 75.211, 75.217, 75.219, 75.220, 75.221, 75.222, and 75.230.

31. REFERENCES

American Psychological Association, Research Office (2004). *2001 Doctorate Employment Survey*. Report by Jessica Kohout and Marlene Wicherski. Washington, DC: American Psychological Association.

Anderson, J.R., Reder, L.M., & Simon, H.A. (2000, Summer). Applications and Misapplications of Cognitive Psychology to Mathematics Education. *Texas Educational Review*. Downloaded from http://act-r.psy.cmu.edu/publications/pubinfo.php?id=146 on March 6, 2006.

Barton, P. E. (2000). What jobs require: Literacy, education, and training, 1940-2006. Washington, DC: Educational Testing Service.

Bennett, K. J., Brown, K. S., Boyle, M., Racine, Y., & Offord, D. (2003). Does low reading achievement at school entry cause conduct problems? *Social Science and Medicine, 56*, 2443-2448

Berne, R., & Stiefel, & L. (1997). Student-level school resource measures. *Selected papers in school finance* (NCES 97-536). http://nces.ed.gov/pubs97/97536.pdf.

Boruch, R., de Moya, D., and Snyder, B. (2001). The importance of randomized field trials in education and related fields. In R. Boruch and F. Mosteller (Eds.). *Evidence Matters*. Washington, DC: Brookings Institution Press.

Carlson, E. A., Sroufe, L. A., Collins, W. A., Jimerson, S., Weinfield, N., Hennighausen, K., Egeland, B., Hyson, D. M., Anderson, F., & Meyer, S. E. (1999). Early environmental support and elementary school adjustment as predictors of school adjustment in middle adolescence. *Journal of Adolescent Research, 14*, 72-94.

Carver, S. M., & Klahr, D. (Eds.). (2001). *Cognition and instruction: Twenty-five years of progress*. Mahwah, NJ: Lawrence Erlbaum Associates, Publishers.

Cepeda, N.J., Pashler, H., Wixted, J.T., & Rohrer, D. (in press). Distributed practice: A review and quantitative synthesis. *Psychological Bulletin*.

Chall, J.S. (1996). Stages of reading development. 2nd edition. Fort Worth, TX: Harcourt Brace.

Coalition for Evidence-Based Policy. (2002, November). Rigorous evidence: The key to progress in education? Lessons from medicine, welfare and other fields. *Proceedings of The Coalition for Evidence-Based Policy Forum*, Washington, DC.

College Board (2005a). *Trends in College Pricing 2005*. New York, NY: College Board

Connor, C. McD., Morrison, F. J., Fishman, B. J., Schatschneider, C., & Underwood, P. (January 26, 2007). *Science*, *315*, 464-465.

Cook, T.D. (2001). Sciencephobia: Why education researchers reject randomized experiments. *Education Next*. Retrieved January 5 from www.educationnext.org.

Cornwell, C. M., Mustard, D. B., & Sridhar, D. (2005, August). The enrollment effects of merit-based financial aid: Evidence from Georgia's Hope scholarship (available at the University of Georgia Web site: *http://www.terry.uga.edu/hope/hope.enrollments.pdf*, accessed on September 5, 2005).

Donner, A., & Klar, N. (2000). *Design and Analysis of Cluster Randomization Trials in Health Research*. New York: Oxford University Press.

Ehrenberg, R. & Brewer, D. (1994) Do school and teacher characteristics matter? Evidence from High School and Beyond. *Economics of Education Review, 14*, 1-23.

Evertson, C.M. & Weinstein, C.S. (2006). Classroom management as a field of inquiry. In C.M. Evertson & C.S. Weinstein. (Eds.), *Handbook of Classroom Management: Research, Practice, and Contemporary Issues*. Mahwah, NJ: Lawrence Erlbaum Associates

Gitomer, D. H., Latham, A. S., & Ziomek, R. (1999). *The Academic Quality of Prospective Teachers: The Impact of Admissions and Licensure Testing*. www.ets.org/praxis/

Goldhaber, D. D. & Brewer, D. J. (1997). Why don't schools and teachers seem to matter? Assessing the impact of unobservables on education. *Journal of Human Resources, 32*, 505-523.

Goldhaber, D. D. & Brewer, D. J. (2000). Does teacher certification matter? High school certification status and student achievement. *Educational Evaluation and Policy Analysis, 22* (2), 129-145.

Gottfredson, G. D., & Gottfredson, D. C. (2001). What schools do to prevent problem behavior and promote safe environments. *Journal of Educational and Psychological Consultation, 12*, 313-344.

Greenwald, R., Hedges, L., & Laine, R. (1996). The effects of school resources on student achievement. *Review of Educational Research, 66*, 361-396.

Hess, F.M. and Kelly, A. P. (2005, May*) Learning to Lead? What Gets Taught in Principal Preparation Programs* (PEPG 05-02). Cambridge, MA: Program on Education Policy and Governance at Harvard University.

Hoffer, T.B., S. Sederstrom, L. Selfa, V.Welch, M. Hess, S. Brown, S. Reyes, K. Webber, and I. Guzman-Barron. (2003). *Doctorate Recipients from United States Universities: Summary Report 2002*. Chicago: National Opinion Research Center. (The report provides the results of data collected in the Survey of Earned Doctorates, conducted for six Federal agencies, NSF, NIH, USED, NEH, USDA, and NASA by NORC.).

Horn, L., & Berger, R. (2004). *College Persistence on the Rise? Changes in 5-Year Degree Completion and Postsecondary Persistence Rates between 1994 and 2000* (NCES 2005-156). U.S. Department of Education, National Center for Education Statistics. Washington, DC: U.S. Government Printing Office.

Horn, L. J., Chen, X., & Chapman, C. (2003). *Getting Ready to Pay for College: What Students and Their Parents Know About the Cost of College Tuition and What They Are Doing to Find Out,* NCES 2003–030. U.S. Department of Education, National Center for Education Statistics. (2003). Washington, DC: 2003.

Kemple, J.J., Herlihy, C.M., & Smith, T.J. (May 2005). *Making progress toward graduation: Evidence from the Talent Development High School Model.* New York, NY: MDRC.

Levin, H.M., & McEwan, P.J. (2001). *Cost-effectiveness analysis: Methods and Applications, 2nd ed*. Thousand Oaks: Sage.

Levine, A. (2005, March) *Educating School Leaders*. New York, NY: Columbia University.

Malecki, C. K., & Elliot, S. N. (2002). Children's social behaviors as predictors of academic achievement: A longitudinal analysis. *School Psychology Quarterly, 17*, 1-23.

Monk, D. H. (1994). Subject area preparation of secondary mathematics and science teachers Kane, T. (2004). Accessed on February 11, 2006 from http://www.wtgrantfoundation.org/usr_doc/After-school_paper.pdf.

Murray, D. M. (1998). *Design and Analysis of Group-Randomized Trials*. New York: Oxford University Press.

Najaka, S. S., Gottfredson, D. C., & Wilson, D. B. (2001). A meta-analytic inquiry into the relationship between selected risk factors and problem behavior. *Prevention Science, 2*, 257-271.

National Center for Education Statistics (2001). *Indicators of school crime and safety*. Washington, DC: Office of Educational Research and Improvement, U.S. Department of Education; Office of Justice Programs, U.S. Department of Justice.

National Center for Education Statistics (NCES). (2003). *Remedial education at degree-granting postsecondary institutions in Fall 2000*. U.S. Department of Education. Washington, DC: U.S. Government Printing Office.

National Research Council. (1999). *Improving student learning: A strategic plan for education Research and its utilization*. Committee on a Feasibility Study for a Strategic Education Research Program. Commission on Behavioral and Social Sciences and Education. Washington, DC: National Academy Press.

National Research Council. (2000). *How people learn: Brain, mind, experience and school*. Committee on Developments in the Science of Learning. J. Bransford, A. Brown, and R. Cocking (Eds.). Committee on Learning Research and Educational Practice. S. Donovan, J. Bransford, and J. Pellegrino (Eds.). Commission on Behavioral and Social Sciences in Education. Washington, DC: National Academy Press.

National Research Council (2002). *Scientific research in education*. Committee on Scientific Principles for Education Research. R.J. Shavelson and L. Towne (Eds.). Center for Education. Division of Behavioral and Social Sciences and Education. Washington, DC: National Academy Press.

Princiotta, D., Flanagan, K. D., and Germino Hausken, E. (2006). *Fifth Grade: Findings From The Fifth-Grade Follow-up of the Early Childhood Longitudinal Study, Kindergarten Class of 1998-99 (ECLS-K)*. (NCES 2006-038) U.S. Department of Education.

Sinclair, M. F., Christenson, S. L., Evelo, D. L., & Hurley, C. M. (1998). Dropout prevention for high-risk youth with disabilities: Efficacy of a sustained school engagement procedure. *Exceptional Children, 65* (1), 7-21.

Snow, C. E., Burns, M. S., & Griffin, P. (Eds.), (1998). Preventing reading difficulties in young children. Washington, DC: National Academy of Sciences.

Waters, J. T., Marzano, R. J., & McNulty, B. A. (2003). *Balanced leadership: What 30 years of research tells us about the effect of leadership on student achievement*. Aurora, CO: Mid-continent Research for Education and Learning.

Wentzel, K. R., (1993). Does being good make the grade? Social behavior and academic competence in middle school. *Journal of Educational Psychology, 85*, 357-364.

Wise, L. L., Harris, C. D., Brown, D. G., Becker, D. E., Sun, S., & Coumbe, K. L. (2003). *California High School Exit Examination: Year 4 evaluation report. Prepared by the Human Resources Research Organization (HumRRO) for the California Department of Education*. Sacramento, CA: HumRRO.