

Education Research and Development Center Program

Assistance Listing Number (ALN): 84.305C

U.S. DEPARTMENT OF EDUCATION

A Product of the National Center for Education Research

Letter of Intent Due:	January 18, 2024	https://iesreview.ed.gov/LOI/LOISubmit
Application Package Available:	December 7, 2023	https://www.grants.gov/
Application Due:	March 7, 2024 (no later than 11:59:59 p.m. Eastern Time)	https://www.grants.gov/
Possible Start Dates:	September 1, 2024	

See the companion IES Application Submission Guide (https://ies.ed.gov/funding/submission_guide.asp) for guidance on preparing and submitting applications through Grants.gov.

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Part I: Overview

A. Purpose of the Education Research and Development Center Program (ALN 84.305C)

Through its National Center for Education Research (NCER), the Institute of Education Sciences (IES) supports a program of research to build knowledge and understanding of education practice and policy. IES was established by the Education Sciences Reform Act of 2002 (ESRA – P.L. 107-279), in part to improve academic achievement and attainment and access to educational opportunities for all learners (ESRA, § 111.b.1.B), with a particular focus on low-performing learners (ESRA, § 115.a.1) and those lacking access to high-quality educational opportunities (ESRA, § 115.a.2.A and 115.a.2.B). In carrying out this mission, we are committed to ensuring that our work is objective, secular, neutral, and nonideological; free of partisan political influence; and free of racial, cultural, gender, or regional bias (ESRA, § 111.b.2.B).

Through the Education Research and Development Center (R&D Center) program, NCER supports R&D centers that conduct research and provide national leadership on key education issues that face our nation. These centers have greater resources than are available through the Education Research Grants program (ALN 84.305A; https://ies.ed.gov/funding/ncer_progs.asp) to tackle understudied but critically important topics and create innovative solutions that could be deployed at scale. See <https://ies.ed.gov/ncer/RandD/> for information on existing national R&D centers.

For the FY 2024 R&D Center competition, IES invites applications for four national R&D centers:

1. [Improving Rural Education](#)
2. [K-12 Teacher Recruitment and Retention Policy](#)
3. [Improving Outcomes in Elementary Science Education](#)
4. [Using Generative Artificial Intelligence to Augment Teaching and Learning in Classrooms](#)

Each of these R&D centers will be responsible for conducting a **focused program of research** that will contribute to solving a specific education problem and generate new knowledge in its topic area; providing **national leadership, capacity building, and outreach** within the topic area; and conducting relatively **rapid research and scholarship on supplemental questions** that emerge within its topic area.

To encourage rigorous education research that is transparent, actionable, and focused on meaningful outcomes, all applicants are expected to incorporate the **IES Standards for Excellence in Education Research** (SEER; <https://ies.ed.gov/seer/>) into their proposed research, as applicable. SEER recommends that researchers pre-register studies; make findings, methods, and data open; address inequities in learners' opportunities, access to resources, and outcomes; identify interventions' components; document treatment implementation and contrast; analyze interventions' costs; use high-quality outcome measures; facilitate generalization of study findings; and support scaling of promising interventions.

NCER expects researchers receiving funding through this program to disseminate evidence in a way that is useful to and accessible by learners, educators, parents, policymakers, researchers, and the public (ESRA, § 112.2). To support accessibility to all stakeholders, IES grantees **must** comply with the IES Policy Regarding Public Access to Research (<https://ies.ed.gov/funding/researchaccess.asp>) and adhere to other open science practices and SEER principles (<https://ies.ed.gov/seer/>) where applicable.

B. Getting Started

1. Technical Assistance for Applicants

IES program officers are available to help applicants refine their ideas and offer advice on methodological and other substantive issues concerning education research. Program officers can work with applicants through a variety of formats up until the time of Grants.gov submission. If you submit a letter of intent (LOI) at <https://iesreview.ed.gov/LOI/LOISubmit>, a program officer will contact you regarding your proposed R&D center. Applicants are encouraged to visit <https://ies.ed.gov/funding/> for additional application resources that address a variety of issues related to application preparation, submission, and the peer-review process.

2. Eligible Applicants

Institutions that have the ability and capacity to conduct rigorous 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.

Broadening Participation in the Education Sciences: IES is committed to broadening institutional participation in its research grant programs. IES encourages applications from minority-serving institutions (MSIs) that meet the eligibility criteria for this request for applications (RFA). MSIs include Alaska Native and Native Hawaiian-Serving Institutions; American Indian Tribally Controlled Colleges and Universities; Asian American and Native American Pacific Islander-Serving Institutions; Hispanic-Serving Institutions; Historically Black Colleges and Universities; Predominantly Black Institutions; and Native American-Serving, Nontribal Institutions.¹

3. Building Your Project Team

The principal investigator (PI) has the authority and responsibility for the proper conduct of the research, including the appropriate use of federal funds and the submission of required scientific progress reports, and is the primary point of contact with IES. The PI is designated by the institution submitting the application. Other personnel having authority and responsibility for the research and use of grant funds should be designated as co-principal investigators (co-PIs). Even if two or more people will share the authority and responsibility for leading and directing the proposed research intellectually and logistically as co-PIs, only one of them may be identified as the PI for the purposes of making a grant award.

IES strives to ensure that the researchers we fund are drawn from the entire pool of talented individuals who bring different backgrounds, perspectives, interests, and experiences to address complex education problems (<https://ies.ed.gov/aboutus/diversity.asp>).

4. RFA Organization and the IES Application Submission Guide

To submit a compliant, responsive, and timely application, you will need to review two documents:

¹ Section 114 of the Education Science Reform Act of 2002 charges IES with undertaking “initiatives and programs to increase the participation of researchers and institutions that have been historically underutilized in Federal education research activities of IES, including historically Black colleges or universities or other institutions of higher education with large numbers of minority students.”

1. *This RFA* provides information on how to prepare an application that is compliant and responsive to the requirements. [Part II](#) sets out the general requirements for a center application and topic-specific requirements for each R&D Center. [Part III](#) provides information about general formatting and the other narrative content for the application, including required and optional appendices. [Part IV](#) provides general information on competition regulations and the review process. [Part V](#) provides a **checklist that you can use to ensure you have included all required application elements to advance to scientific peer review**. [Part VI](#) provides the codes to enter in Item 4b of the SF 424 Application for Federal Assistance form.
2. *The IES Application Submission Guide* (https://ies.ed.gov/funding/submission_guide.asp) provides important information about submission procedures and IES-specific guidance and recommendations to help you ensure your application is complete and received without errors on time through Grants.gov.

We strongly recommend that both the principal investigator (PI) and the authorized organization representative (AOR) read both documents.

5. Ensuring Your Application is Forwarded for Scientific Peer Review

Only compliant and responsive applications received before the date and time deadline are peer reviewed for scientific merit and practical significance. The PI and the AOR should work together to ensure that the application meets these criteria.

a) On-time submission

- Received and validated by Grants.gov **no later than 11:59:59 p.m. Eastern Time on March 7, 2024** (See the separate IES Application Submission Guide https://ies.ed.gov/funding/submission_guide.asp)

b) Compliance

- Includes the **required R&D center narrative** (see [Part II](#))
- Includes the **required [Appendix A: Data Sharing and Management Plan](#)** (see [Part III](#))
- Includes the **required [Appendix D: Letters of Agreement](#)** for the Rural and K-12 Teacher Centers (see [Part III](#))
- Adheres to all **formatting requirements** (see [Part III](#))
- Adheres to all **page limit maximums** for the R&D center narrative (see [Part II](#)) and appendices (see [Part III](#)). IES will remove any pages above the maximum before forwarding an application for scientific peer review

c) Responsiveness

- Meets **General Requirements** (see [Part II](#))
- Meets **Sample, Outcomes, and Setting Requirements** for the selected R&D Center topic (see [Part II](#)).
- Meets **R&D Center Narrative Requirements** for the selected R&D Center topic (see [Part II](#)).

C. Changes to the FY 2024 RFA

Major changes to the Education Research and Development Center Program (ALN 84.305C) competition in FY 2024 are listed below and described fully in relevant sections of the RFA.

Increased emphasis on open science principles — Throughout the RFA, we highlight IES requirements that support the goals of open science and the various opportunities afforded to IES grantees to share their research findings broadly and to encourage transparency in education research.

- **Requirement for grantees to use persistent identifiers (PIDs)** — In August 2022, the Office of Science and Technology Policy (OSTP) issued a Memorandum on Ensuring Free, Immediate, and Equitable Access to Federally Funded Research (<https://www.whitehouse.gov/wp-content/uploads/2022/08/08-2022-OSTP-Public-Access-Memo.pdf>). This updated open access policy will go into effect by December 31, 2025. In anticipation of these changes and consistent with National Security Presidential Memorandum 33 (NSPM-33; see <https://www.whitehouse.gov/wp-content/uploads/2022/01/010422-NSPM-33-Implementation-Guidance.pdf>) that establishes policies for federal funding agencies that protect national security while supporting open science, IES is requiring that all key personnel for funded grants obtain a PID such as ORCID iD (Open Researcher and Contributor Identification; <https://orcid.org/>) prior to award.
- **Updated guidance on the data sharing requirement component of the IES Policy Regarding Public Access to Research** — Applicants are required to include a plan in [Appendix A](#) that describes how project data will be managed and ultimately how a final research dataset will be shared, as required by the IES Public Access Policy <https://ies.ed.gov/funding/researchaccess.asp>. We have updated our guidance on this IES requirement and made a change to the name of this plan: what was previously called the Data Management Plan is now called the Data Sharing and Management Plan to emphasize the need to anticipate sharing when collecting and curating data. When selecting a repository for data sharing, applicants are encouraged to select among public repositories that align with the characteristics described in the National Science and Technology Council document entitled “Desirable Characteristics of Data Repositories for Federally Funded Research” (<https://repository.si.edu/handle/10088/113528>), whenever feasible.

Part II: R&D Center Requirements and Recommendations

For this competition, you **must** submit to one of the four R&D Center topics described in this section. You **must** identify your chosen topic on the Application for Federal Assistance SF 424 form (Item 4b) of the Application Package (see the IES Application Submission Guide (https://ies.ed.gov/funding/submission_guide.asp) and the [topic codes in Part VI](#)) to ensure that your application is assigned appropriately for scientific peer review.

A. General Requirements for all R&D Center Applications

1. Eligible Study Populations

NCER funds education research that addresses the needs of learners from prekindergarten through postsecondary and adult education². If you propose research focused *solely* on the needs of learners with or at risk for disabilities, you **must** apply to the separate grant programs run by the National Center for Special Education Research (NCSEER; <https://ies.ed.gov/ncser>). The only exception is for research focused on learners with or at risk for disabilities in adult education settings which you **must** submit to NCER.

2. Education Settings

Proposed research **must** be relevant to education in the United States and **must** address factors under the control of U.S. education systems. Proposed research must also be conducted in or use data from formal education settings in the United States, as described below.

Formal education in the United States includes but is not limited to center-based prekindergarten programs, public and private K-12 schools, community colleges, technical colleges, and 4-year colleges and universities. In addition, there are also formal programs under the control of education agencies that take place out of school including after-school, distance learning, and online. Additionally, adult education programs can be operated by community-based organizations, libraries, and other entities receiving support from government education agencies and occur in a variety of settings.

3. R&D Center Narrative

You **must** include an R&D Center Narrative with five sections: (i) **Significance of the Focused Program of Research**, (ii) **Research Plan for the Focused Program of Research**, (iii) **National Leadership, Capacity Building, and Outreach Activities**, (iv) **Management and Institutional Resources**, and (v) **Personnel**. If any of these five sections are missing the application will not move forward to peer review.

The R&D Center Narrative **must** adhere to the formatting guidelines (see [Part IV.B](#)) and be **no more than 35 pages**. For example, the use of small type will be grounds for IES to return the application without scientific peer review. If the narrative exceeds the page limit, IES will remove any pages after the 35th page of the narrative.

² For the purposes of this RFA, *adult education* refers to the system and authorized providers that serve learners at least 16-years old who are not enrolled in the standard K-12 system but are or could be preparing for, transitioning into, or currently enrolled in adult literacy programs, as defined in Title II, the "Adult Education and Family Literacy Act" of the 2015 Workforce Innovation and Opportunities Act (WIOA), such as Adult Basic Education, Adult Secondary Education, Integrated Education Training, Family Literacy, Integrated English Language and Civics.

B. Specific Requirements and Recommendations for R&D Centers

For each R&D Center Topic —

- **See the Purpose section** for a description of key challenges and identified needs that each R&D Center will address in the R&D Center's topic area.
- **See the Award Limit section** for the maximum duration and budget that can be requested for each R&D Center Topic.
- **See the Requirements section** for the specific content that you **must** address in the five sections of the R&D Center narrative. **Applications lacking this specific content will not be forwarded to peer review.**
- **See the Recommendations for Strong Applications section** for recommendations to improve the quality of your application. Reviewers determine quality in part by considering whether you have incorporated relevant recommendations appropriately. Many of these recommendations are aligned with the SEER principles (<https://ies.ed.gov/seer/>) to help ensure that research is transparent, actionable, and focused on meaningful outcomes that have the potential to dramatically improve education.

Note that IES may invite researchers funded through this competition to apply later for funding to extend the data collection period to collect follow-up data on study participants. Applicants should plan for this possibility by proposing procedures to maintain contact with participants and ensuring IRB protocols are written to allow researchers to follow participants longitudinally.

1. Improving Rural Education

Program Officer: Dr. Emily Doolittle (202-987-0795; Emily.Doolittle@ed.gov)

a) Purpose

Under this topic, IES requests applications to establish a National Research and Development (R&D) Center on Improving Rural Education (Rural Center) to conduct research in at least two states or territories on a major problem or issue in rural education that involves local stakeholders and addresses their needs.

Public rural schools serve 9.8 million students, representing 19 percent of total public-school enrollment (see <https://nces.ed.gov/programs/coe/locale>). When examined as a whole, rural schools and students appear to perform at similar or better levels than their counterparts in towns, suburbs, and cities. For example, the adjusted rural cohort high school graduation rate of 90 percent is similar to or slightly above the rate for suburban areas and cities. Similarly, immediate fall enrollment in postsecondary education by rural high school graduates is close to that of urban and suburban high school graduates. As a whole, rural schools often experience the same level of or fewer factors that may complicate education. For example, rural poverty rates for children are below those rates in cities and towns and only slightly above the suburban rate.

These positive average education outcomes for rural learners mask wide variation in rural student outcomes and access to educational opportunities, and in the factors that affect rural education. IES is interested in supporting research that will be useful to rural districts facing challenging social factors such as high levels of persistent poverty, growing numbers of English learners, and reduced employment opportunities for recent high school and college graduates. IES is also interested in understanding how rural districts might address what are often seen as unique logistical challenges. These include small populations and low population densities (leading to smaller schools with reduced advanced education offerings), wide geographic spread (resulting in long travel times to school), geographic isolation (meaning lack of local access to postsecondary institutions and community resources), and lower levels of funding and personnel. These logistical challenges may also make it difficult to do research in rural districts, for rural districts to find research directly relevant to their needs, and to adopt such research when available.

The Rural Center will generate evidence about critical challenges in rural education, lead national conversations about rural education, and work closely with rural districts in at least two states or territories who face the greatest challenges in providing educational opportunities and improving learner outcomes.

b) Award Limit

No more than \$10,000,000 (direct and indirect costs) over no more than 5 years.

- The duration and budget you request should reflect the actual time and amount of funding necessary to conduct your proposed scope of work.
 - Five percent of the center's budget **must** be set aside to conduct supplemental activities to be determined in cooperation with IES after the award is made.
- **IES will not make an award under the Rural Center Topic that exceeds \$10,000,000 or that is for longer than 5 years.**

c) Requirements

Applications under the Rural Center topic **must** meet the requirements set out under **(a) Sample, Outcomes, and Setting** and **(b) R&D Center Narrative** in order to be responsive and sent forward for scientific peer review.

i. Sample, Outcomes, and Setting

(1) Sample

- Your research **must** focus on PreK, K-12, postsecondary, and/or adult learners.
 - You may focus on the entire spectrum of PreK to adult learners or a subset of grade/age levels.

(2) Outcomes

- One or more of the following learner academic outcomes **must** be measured as part of the proposed research:
 - For **prekindergarten** – school readiness outcomes which include pre-reading; language; vocabulary; early-STEM (science, technology, engineering, and/or mathematics) knowledge; English language proficiency; digital literacy; and/or social, emotional, and behavioral competencies (including self-regulation and/or executive function) that prepare young children for school
 - For **kindergarten through Grade 12** – learning, achievement, and higher order thinking in the academic content areas of literacy, STEM, and social studies;³ English language proficiency; career and technical education (CTE) attainment;⁴ digital literacy; and progression through education systems as indicated by course and grade completion, retention, high school graduation, and/or dropout
 - For **postsecondary education** – learning, achievement, and higher order thinking in postsecondary courses; and access to, persistence in, progress through, and/or completion of postsecondary education, which includes developmental education and corequisite support courses, bridge programs, for-credit and non-credit programs that lead to occupational credentials and certificates, and for-credit programs that lead to associate or bachelor's degrees
 - For **adult education** – achievement in literacy, English language proficiency, and/or numeracy, as well as access to, persistence in, progress through, and/or completion of adult education courses and programs including the full range of course and program types described in Title II of the Workforce Innovation and Opportunity Act of 2015 (WIOA; <https://www.dol.gov/agencies/eta/wioa>)
- If you are examining the role of educators in improving learners' academic outcomes, you **must** also measure educator knowledge, skills, beliefs, behaviors, and/or practices.
- If you are examining learners' social, emotional, and/or behavioral competencies and/or efforts to improve them, you **must** also include measures of these competencies.

³ Social studies outcomes are defined as a learner's understanding of government structures and processes and how to be an engaged and knowledgeable citizen through skills and knowledge in civics, citizenship, geography, history, and economics.

⁴ CTE attainment is defined as an indicator of mastery of CTE content or skills such as CTE course grades or credits earned, technical skills, assessment scores, industry certification, or employment outcomes in a field related to the CTE training.

(3) Setting

- Your research **must** take place in rural locales as defined using federal criteria (for example, <https://nces.ed.gov/surveys/annualreports/topical-studies/locale/definitions> or <https://www.ers.usda.gov/topics/rural-economy-population/rural-classifications/>), or the criteria used by the states or territories in which you will be working.
- You **must** plan to conduct research in **at least two states or territories**, and you **must** include a letter of agreement in [Appendix D](#) from each partner state or territory.

ii. R&D Center Narrative

The five sections of the Rural Center Narrative **must** include the content described below. Please see the [recommendations section](#) for additional information about what to include.

(1) Significance of the Focused Program of Research

The purpose of this section is to explain the significance of the focused program of research.

You **must** describe

- the problem or issue that you will examine
- your research questions

(2) Research Plan for the Focused Program of Research –

The purpose of this section is to describe the sample, setting, research design, methods, and data analysis plans for each study in the focused program of research and demonstrate how they will allow you to answer your research questions.

For each study proposed, you **must** describe

- the characteristics of the sample(s) and setting(s)
- the research design(s), method(s), and data analytic approach(es)

(3) National Leadership, Capacity Building, and Outreach Activities

The purpose of this section is to describe and justify the importance of the national leadership, capacity building, and outreach activities that the Rural Center will conduct to promote the center's national visibility and allow it to function as a trusted source of scientific research in Rural Education.

You **must** describe how you will

- contribute to improved rural education policy and/or practice and learner outcomes
- disseminate what the Rural Center is learning to various stakeholders
- build the field's capacity to conduct rural education research

(4) Management and Institutional Resources –

The purpose of this section is to demonstrate that you have the organizational structure, institutional capacity, and access to resources needed to carry out and effectively manage the research studies and national leadership activities of the center.

You **must** describe the

- organizational structure of the center
- plans and procedures for the overall management of the center
- resources to support the work of the center

(5) Personnel

The purpose of this section is to demonstrate that your team possesses appropriate training and experience to carry out the focused program of research and national leadership activities and will commit sufficient time to the center.

You **must** describe your team.

d) Recommendations for Strong Applications

IES provides recommendations intended to improve the quality of your application. Peer reviewers are asked to consider these recommendations in their evaluation of your application.

i. Significance of the Focused Program of Research

Describe in detail the major rural education issue(s) or problem(s) in at least two states or territories that the Rural Center will address. Explain why the problem or issue is significant to rural education policy and practice and how the center's focused program of research will help rural districts, schools, providers of center-based early learning, institutions of higher education (IHEs), and/or adult education providers improve learner education outcomes.

Provide a rationale for how you selected the two (or more) states or territories where you will be carrying out the focused program of research.

You may propose a single, large study or multiple studies that will build new knowledge on how to improve education policy, practice, and learner education outcomes in rural settings.

Explain how the Rural Center's work will advance theory and practice in rural education, including how the research will provide information that policymakers and practitioners can use to improve their schools and education practice in rural schools not involved with the center.

Describe how the research will be designed and carried out as a collaboration among researchers, policymakers, and practitioners.

- IES encourages you to work with education agencies (including preK-12, postsecondary, and/or adult education agencies) in at least two states or territories that have distinct demographic, logistical, and/or social characteristics.
- Consider including research organizations and policymaking and practitioner organizations (such as education agencies, rural postsecondary institutions, state higher education systems and agencies, adult education agencies and providers), and other relevant stakeholders and organizations that support rural schools and their communities.⁵
- Describe how the research will be collaborative from start to finish including development of the research questions, the research design and its implementation, discussion of the results as they are obtained, consideration of the practice and policy implications of the results,

⁵ Local education agencies may also include tribal education agencies and organizations authorized by the state to support rural districts, e.g., regional education service agencies (RESAs) or boards of cooperative educational services (BOCES) that work with rural districts.

dissemination of the results to multiple audiences, and planning for future research.

ii. Research Plan for the Focused Program of Research

Strong applications will demonstrate that the sample, setting, research design, methods, and data analysis plans align with the research questions posed in the Significance section and that the center will be able to answer those questions with sufficient rigor.

Include a timeline for study activities in [Appendix B: Supplemental Charts, Tables, and Figures](#).

Discuss how your focused program of research conceptualizes education equity, and how the design, sample, measurement, analysis, and reporting for each study align to that conceptualization. For additional resources see <https://ies.ed.gov/seer/equity.asp>.

Identify the stakeholders who will take part in each study and how they will be involved. Use a mixed methods approach whenever possible.

Include settings that can be considered economically disadvantaged (for example, persistently poor; <https://www.ers.usda.gov/data-products/poverty-area-measures/#>) and/or geographically isolated (for example, remote districts; <https://nces.ed.gov/programs/edge/Geographic/LocaleBoundaries>).

- Include information on race and ethnicity, rates of poverty, and other relevant details that show how you think about or define the rural education context.
- Identify the key learner groups that will be the focus of the center. IES is particularly interested in understanding the needs of rural learners from economically disadvantaged families, English learners, learners from certain racial/ethnic minority groups, and/or highly mobile learners (for example, migrants, unhoused learners, or those in foster care).

The types of studies you propose will depend upon your research question(s) and the current state of knowledge. You may propose descriptive, correlational, predictive and/or causal analyses. IES does not favor any one type of analysis but expects that the proposed analyses will be high quality, provide information that will address the research questions, and help education policymakers and practitioners in their decision making.

For each study you propose, provide a detailed description of

- The education problem(s) or issue(s) you intend to address
- The major research question(s) you intend to answer
- The sample
- The learner education outcomes you will measure, any proximal measures you will use, and any other outcomes you intend to measure (including those required under [Sample, Outcomes, and Setting](#))
- The data collection procedures
- Power analyses for any pilot or impact studies
- Data analysis procedures
- The findings or products you will generate and their intended audiences or uses

iii. National Leadership, Capacity Building, and Outreach Activities

Provide a timeline that shows when major national leadership, capacity building, and outreach activities will take place in [Appendix B](#). Describe how those activities will inform one another and how they build from or feed into the center's focused program of research.

Discuss how the center's national leadership activities will address needs and challenges in rural education, including the major problem(s) or issue(s) identified for the proposed Rural Center.

Describe how you will disseminate information about the Rural Center's activities and research findings to various audiences through a website, policy briefs, and discussions of findings with state and local education leaders. Plan to host meetings and conferences to foster collaboration and communication on problems or issues of importance to rural educators and to discuss possible approaches, programs, or policies to address these issues. Describe how you will share findings with the U.S. Department of Education's Technical Assistance Centers (<https://oese.ed.gov/resources/oese-technical-assistance-centers/>) and the IES Regional Educational Laboratories (RELs; <https://ies.ed.gov/ncee/rel/>).

Discuss your plans for convenings with various stakeholders. Consider establishing a forum or taking part in an existing forum composed of practitioners, policymakers, and researchers for identifying ongoing rural research needs. Identify the information brokers providing recommendations on improving rural education to the state and local agencies you will be working with and involve them in center activities including dissemination.

Plan to meet with other IES-funded researchers at the Annual IES Principal Investigators Meeting. Discuss the major goals for meeting with them, how you will facilitate the exchange of information and ideas, and how you might work with them and IES to determine training or dissemination needs and to form appropriate plans to meet these needs. You might consider including a proposed agenda for the first meeting in your narrative or [Appendix B](#).

Describe how you will build research and research use capacity in the geographic regions where the Rural Center is working by involving and training researchers from communities in or near where the research is taking place. Discuss how this collaborative work will build infrastructure for continuing high quality rural education research after the Rural Center ends.

- Develop resources and provide training to build the capacity of rural schools, education agencies, rural postsecondary institutions, and/or rural adult education providers to take part in and/or to use high-quality, scientific research to improve learner education outcomes.
- Identify the knowledge, skills, and abilities that professionals (including institutional researchers, administrators, and education researchers) need to build and discuss the activities, products, and resources the Rural Center will create to address their needs.

Describe how you will develop the next generation of rural education researchers through training workshops, learning opportunities, and resources for graduate students, early career researchers, researchers new to rural education, and state and local agency staff who are not directly involved in the work of the Rural Center. Discuss any opportunities you will provide for graduate students or early career researchers to contribute to the Rural Center's activities and gain meaningful experience.

iv. Management and Institutional Resources

Describe plans and procedures for the overall management of the Rural Center and its various activities. Strong applications will demonstrate that you have sufficient research infrastructure and institutional capacity to carry out the focused program of research and the national leadership, capacity building, and outreach activities. Strong applications will also demonstrate that the commitments of each partner show support for the implementation and success of the center.

Identify the management structure and procedures you will use to keep the work of the Rural Center on track and ensure that the center is responsive to the concerns and needs of IES while also carrying out the focused program of research and national leadership activities.

- Make clear how all research institutions and education settings that are involved in the Rural

Center will work with one another, share information, and contribute to decision-making. It may be useful to include an organizational chart in [Appendix B](#).

- Discuss your plans and procedures for coordinated communication and collaboration across settings and partner research institutions.
- If you plan to add research sites or partners once the Rural Center is established or over time, describe how you will identify, recruit, and establish formal relationships with these sites and the timeline for this work.

Describe the capacity and resources you will use to support the work of the center at both the primary applicant institution and any subaward institutions, including your

- institution's capacity to manage a grant of this size
- immediate access to resources available at the primary institution and any subaward institutions
- plan for acquiring any resources that are not currently accessible, will require significant expenditures, and are necessary for the center to be successful
- access to specific offices and organizations that will support planned national leadership, capacity building, and outreach activities
- access to specific offices or organizations that will support dataset documentation and execution of the required Data Sharing and Management Plan (DSMP; see [Appendix A: Data Sharing and Management Plan](#))
- access to the settings and data sets necessary for the proposed research. Include letters of agreement, data licenses, or existing memoranda of understanding in [Appendix D](#) documenting this access

Describe your capacity and plans to manage the Rural Center.

- Discuss any prior experience managing a grant of this size, including coordinating the work of multiple partners; managing large budgets including subcontracts; running large meetings, conferences and videoconferences; conducting other national leadership activities; and annual reporting.
- Make clear how all research institutions and education settings that are involved in the R&D Center will work with one another, share information, and contribute to decision-making. It may be useful to include an organizational chart in [Appendix B](#).
- Discuss your plans and procedures for the overall management of these diverse stakeholders and activities, including coordination of communication and collaboration across settings and partner research institutions.
- If you plan to add research sites or partners once the R&D Center is established or over time, describe the process for identifying, recruiting, and establishing formal relationships with these sites and the timeline for this work.

Describe the steps you will take to ensure meaningful involvement from state, regional, and/or local agencies and postsecondary institutions, and other stakeholders in the communities where you are working.

- IES encourages including representatives from the agencies and/or postsecondary institutions as personnel on the Rural Center and using grant funds to support their work as part of the center. Describe how you will involve these representatives in identifying key issues for research, advising you on how best to implement research, discussing the implications of findings, and identifying areas for follow-on research.

- Identify other stakeholder groups you will involve, their work regarding the rural issue or problem you are examining, and their role in the center's work.
- Explain whether your relationship with these education settings and/or other stakeholder groups is new for this application or extends a prior relationship.

Include signed Letters of Agreement in [Appendix D](#) from the education settings where the initial research will take place (more settings can be added later); any education settings that will play a role, either directly or in an advisory capacity, in the center's work; and all other research institutions to be included in the center's work as research partners. IES recommends you include regional research institutions based in or near the rural education settings where your work is taking place to help build their capacity to conduct and use research.

v. Personnel

IES strongly encourages applicants to the Rural Center to propose partnerships among key stakeholders to help guide the focused program of research and the national leadership activities. Discuss any existing partnerships as well as plans to form additional partnerships to support the work of the center. In its research grant programs, IES is strongly committed to broadening participation, including personnel from underrepresented communities and diverse institutions.

Describe how the background and experience of the Rural Center team supports the conduct of the focused program of research and the national leadership activities with the population of learners that the center will address.

- Identify the key personnel who will be responsible for each of the studies proposed for the focused program of research and the amount of time they will devote. Provide a plan for how key personnel will maintain their objectivity in conducting the proposed research and dissemination activities. If key personnel have previously led one or more IES grants, briefly discuss the outcomes of the research, including products developed and/or tested and how the project's findings and products were disseminated consistent with IES's mission.
- Identify and describe the personnel from state, regional, and/or local agencies (at least one per state or territory in which the research is taking place) and their roles, qualifications, and experience with rural research. Describe their role in the decision-making process regarding the rural issue or problem you are examining.
- Describe additional personnel at the primary applicant institution and any subaward institutions along with any consultants.

2. K-12 Teacher Recruitment and Retention Policy

Program Officer: Dr. Wai-Ying Chow (202-245-8198; Wai-Ying.Chow@ed.gov)

a) Purpose

Under this topic, IES requests applications to establish a National Research and Development (R&D) Center on K-12 Teacher Recruitment and Retention Policy (K-12 Teacher). Its central purpose is to bring together an interdisciplinary research team to examine the impact of policies intended to address one or more teacher shortage areas in general education in at least two states.

Shortages in the K-12 classroom teacher workforce are a longstanding problem and have worsened in recent years. School Pulse Survey (<https://ies.ed.gov/schoolsurvey/spp/>) results indicate 44 percent of public schools reported having one or more vacant teaching positions during the fall of 2022, with greater rates in high-poverty communities (57 percent high-poverty versus 41 percent low-poverty) and in schools with higher minority populations (60 percent high-minority versus 32 percent low-minority). The overwhelming majority of schools attribute difficulties to filling vacancies to too few applicants.

These findings coincide with declining enrollment in and completion of teacher education programs (<https://title2.ed.gov/Public/Home.aspx>) over the past decade. Fewer parents report wanting a public-school teaching career for their own child for a variety of reasons including inadequate pay and benefits; the difficulties, demands, and stress of the job; and lack of respect or being valued (<https://pdkpoll.org/>). These reasons are consistent with perennial teacher reports of adverse working conditions, stress, burnout, and intention to quit, all of which have recently been exacerbated by COVID and other systemic events. Altogether, these findings suggest every step of the teaching career pathway - from respecting the profession and aspiring to teach to becoming a teacher and staying a teacher - is under severe strain.

Currently, states and territories across the United States are establishing and implementing policies designed to reduce teacher shortages and address the challenges schools and districts are facing with teacher recruitment and retention. The K-12 Teacher Center will provide national leadership and generate evidence about the effects of these policies with the long-term goal of improving K-12 teacher recruitment and retention and in turn learner academic outcomes.

b) Award Limit

No more than \$10,000,000 (direct and indirect costs) over no more than 5 years.

- The duration and budget you request should reflect the actual time and amount of funding necessary to conduct your proposed scope of work.
 - Five percent of the center's budget **must** be set aside to conduct supplemental activities to be determined in cooperation with IES after the award is made.
- **IES will not make an award for a K-12 Teacher Center that exceeds \$10,000,000 or that is for longer than 5 years.**

c) Requirements

Applications under the K-12 Teacher Center topic **must** meet the requirements set out under **(a) Sample, Outcomes, and Setting** and **(b) R&D Center Narrative** in order to be responsive and sent forward for scientific peer review.

i. Sample, Outcomes, and Setting

(1) Sample

- Your research **must** focus on K-12 general education teachers and the learners they teach.
 - You may focus on the whole K-12 system or a subset of grade/age levels.

(2) Outcomes

- One or more of the following learner academic outcomes **must** be measured as part of the proposed research:
 - learning, achievement, and higher order thinking in the academic content areas of literacy, STEM, and/or social studies;⁶
 - English language proficiency;
 - career and technical education (CTE) attainment;⁷
 - digital literacy; and/or
 - progression through education systems as indicated by course and/or grade completion, retention, high school graduation, and/or dropout
- Your proposed research **must** include measures of teacher recruitment and/or retention outcomes.
- If you are proposing research focused on pre-service experiences, your research **must** measure the outcomes of the pre-service teaching candidates as well as the outcomes of the K-12 learners they ultimately teach.

(3) Setting

- You **must** plan to conduct research in **at least two states or territories** and you **must** include a letter of agreement in [Appendix D](#) from each partner state or territory *and* a data-sharing agreement in [Appendix A](#) for each partner state or territory.

ii. R&D Center Narrative

The five sections of the K-12 Teacher Center narrative **must** include the content described below. Please see the [recommendations section](#) for additional information about what to include.

(1) Significance of the Focused Program of Research

The purpose of this section is to explain the significance of the focused program of research.

You **must** describe

⁶ Social studies outcomes are defined as a learner's understanding of government structures and processes and how to be an engaged and knowledgeable citizen through skills and knowledge in civics, citizenship, geography, history, and economics.

⁷ CTE attainment is defined as an indicator of mastery of CTE content or skills such as CTE course grades or credits earned, technical skills, assessment scores, industry certification, or employment outcomes in a field related to the CTE training.

- the policies on which the center will focus

(2) Research Plan for the Focused Program of Research

The purpose of this section is to describe the sample, setting, research design, methods, and data analysis plans for each study in the focused program of research and demonstrate how they will allow you to answer your research questions.

You **must** describe plans

- to assess the impact of teacher recruitment and/or retention policies in at least two states or territories
- to document implementation of the policies being studied
- for carrying out cost and cost effectiveness analyses of the policies being studied

(3) National Leadership, Capacity Building, and Outreach Activities

The purpose of this section is to describe the national leadership, capacity building, and outreach activities that the center will conduct to promote the center's national visibility and allow it to function as a trusted source of scientific research in K-12 Teacher Recruitment and Retention Policy.

You **must** describe how you will

- contribute to improved K-12 teacher recruitment and/or retention and learner academic outcomes
- disseminate what the K-12 Teacher Center is learning to stakeholders
- build the field's capacity to conduct K-12 teacher recruitment and retention research

(4) Management and Institutional Resources

The purpose of this section is to describe the management and institutional resources that will support the work of the center, including the organizational structure, institutional capacity, and access to resources needed to carry out and effectively manage the research and national leadership activities of the center.

You **must** describe the

- organizational structure of the center
- plans and procedures for the overall management of the center
- resources to support the work of the center

(5) Personnel

The purpose of this section is to demonstrate that your team possesses the appropriate training and experience to carry out the focused program of research and national leadership activities and will commit sufficient time to the center.

You **must** describe your team

d) Recommendations for Strong Applications

IES provides recommendations intended to improve the quality of your application. Peer reviewers are asked to consider these recommendations in their evaluation of your application.

i. Significance of the Focused Program of Research

Describe the nature and extent of the general education teacher shortage area(s) you will address and possible reasons behind them.

- Identify characteristics of the schools and teachers most at risk for problems with recruitment and retention (particularly in comparison to those least at risk) in the states or territories where you will be working.
- Explain how the policies you plan to study will investigate address the unique needs of these schools and teachers in their respective settings.
- Synthesize any extant findings about recruitment and retention outcomes for locales that have implemented policies to address the shortage areas that are the focus of the center. Describe the characteristics of schools and teachers that have been the focus of these policies, including whether these schools serve predominantly high-poverty communities or employ teachers of color.

Synthesize the empirical literature on the most common reasons for choosing to pursue a K-12 teaching career and for choosing to stay/leave teaching. Identify research gaps based on your literature review. For the policy or policies you propose to study, describe the theories of change linking policies to these factors, including outcomes at the district/school level and K-12 teacher/learner outcomes. Attend to multiple potential causal factors in your synthesis, including those frequently noted in surveys of K-12 educators, and proposed theory(ies) of change. For instance, the policy or policies you propose to study might intend to change

- the features and actions of school leadership that shape teacher recruitment and retention and the policies intended to improve school leadership
- societal/community valuing and respect for teachers and the policies intended to reduce tensions and improve relationships between teachers and the community they work in
- teacher schedule, workload, responsibilities beyond direct academic instruction with learners, and the policies (for example, teacher-learner ratio, class sizes, paraeducators, availability of substitutes, mental health professionals to help manage learner disruptive behavior, regular official work time set aside for collaboration with and support from peers/mentors) intended to address direct causes of teacher stress and burnout
- pre-service experiences/qualifications to improve workforce readiness and teacher self-efficacy for the real-world demands of K-12 teaching

Describe the policy(ies) you propose to evaluate, including

- their core features, including essential practices and structural elements
- the conditions that must be in place for the desired change in outcomes to occur

Discuss the relevance of the proposed research to policy and practice, including

- partnerships with education agencies to carry out the proposed work
- factors shaping the time necessary to reach adequate implementation fidelity for the policy and for states/districts/schools/teachers to detect improvements on teacher recruitment and/or retention
- key considerations by decision-makers at the SEA, LEA, or school level in adopting policy and the ways the center will address those considerations in the focused program of research and through its national leadership activities

ii. Research Plan for the Focused Program of Research

Strong applications will demonstrate that the sample, setting, research design, methods, and data analysis plans align with the policy impact questions the center proposes to address and that the center will be able to answer those questions with sufficient rigor.

Include a timeline for study activities in [Appendix B: Supplemental Charts, Tables, and Figures](#).

Discuss how your focused program of research conceptualizes education equity, and how the design, sample, measurement, analysis, and reporting for each study align to that conceptualization. For additional resources see <https://ies.ed.gov/seer/equity.asp>.

Describe the target population of K-12 teachers and their learners that your samples represent. Explain how your work with these samples will contribute to a larger body of knowledge on teacher recruitment and retention policy for the target population.

Describe strategies to increase the likelihood that participants will join the project and remain in the study (reduce attrition).

Describe the setting(s) in which the research will take place (provide required letters of agreement in [Appendix D](#)) and discuss how they will allow you to draw conclusions about the education settings your research is intended to inform.

Explain how you will integrate direct input from K-12 teachers, school leaders, policymakers, and other stakeholders throughout the research process using a mixed methods approach whenever possible.

For each study you propose, provide a detailed description of the

- K-12 teacher shortage area(s) you intend to address
- major research question(s) you intend to answer
- sample to be studied
- teacher outcomes to be examined and measures you will use
- learner academic outcomes to be examined and the measures you will use
- data collection procedures
- power analyses
- data analysis procedures
- findings or products you will generate and their intended audiences or uses

Describe how secondary data (if any) such as statewide longitudinal data systems (SLDSs; <https://nces.ed.gov/Programs/SLDS/>) will be used. Describe how different datasets will be linked, for example by linking data from teacher preparation programs or state and district survey data with data from SLDS, and merged with primary datasets.

The impact studies you propose should use designs that are eligible to meet the IES What Works Clearinghouse (WWC) design standards that are in effect at the time of RFA publication (<https://ies.ed.gov/ncee/wwc/Handbooks>). Provide a rationale for the research design you propose. Explain how your study will meet WWC design standards with or without reservations. IES expects applicants to use the strongest research design available to address the proposed impact questions. The WWC currently only reviews studies that use one of the following designs:

- Group RCTs

- Sequential, multiple assignment, randomized trials (SMARTs)
- Regression discontinuity designs (RDDs)
- Quasi-experimental designs (QEDs) including cross-sectional group designs, comparative interrupted time series, difference-in-difference designs, and growth curve designs
- Single case experimental designs (SCDs)

When feasible, choose a study design that allows valid estimates to be calculated for different settings or groups within your proposed sample.

Plan for Documenting Implementation of Policies Being Studied

Describe the plan for monitoring/measuring policy implementation fidelity, including the processes, strategies, and materials needed to support its implementation and the settings(s) where it is being, will be, and/or was implemented.

Describe your plan to develop and examine the psychometric properties of the measures of policy implementation fidelity.

Describe how you will identify similar components in the comparison group.

Describe your plan for examining implementation fidelity in relation to your outcomes of interest. The results of such analyses may be used to improve the quality and scalability of the policy through improvements in design, use, and support.

Describe the learner, educator, and/or setting characteristics that might affect implementation and how you will examine their influence. Describe how you will determine the factors that are associated with higher (or lower) fidelity as well as time to implementation fidelity and likelihood of sustainability. These factors could include characteristics of those who implement the policy; adaptations made in response to local context; as well as classroom, school, and district organizational factors.

Describe how you will identify adaptations of the policy when implemented by the educators in your evaluation. Describe how you will identify the local contexts that lead to adaptations and whether these adaptations are correlated with education outcomes. Identify opportunities to learn from adaptations of the policy that were observed during implementation.

For additional resources see <https://ies.ed.gov/seer/implementation.asp>.

Cost Analysis and Cost Effectiveness Analysis Plans for Proposed Impact Studies

In your cost and cost effectiveness analysis plan, describe the level that is most relevant for the policy being studied, whether the state, district, school, classroom, or individual learner level. Describe how you will estimate costs using a societal perspective. Describe the cost method you will use, noting whether another perspective, such as that of the state/local education agency, will also be included. A cost-effectiveness analysis is required only for the primary learner outcome(s) and the teacher retention/recruitment outcomes. The analysis should be conducted at the level that is most relevant for the policy being studied, whether the school, classroom, or individual learner level.

Explain how you will collect data about costs, including the time period for the cost data collection, the data collection assessments you will use, and the sources you will use to obtain national prices for resources and, if useful to a local audience, local prices. Describe how you will calculate the cost of the resources, the cost of core components of the policy, and the total and incremental cost of implementing the policy. Include details such as how you will adjust prices where needed (for example, to account for inflation, geographic price differences, the time value of money), assign costs

to resources that are provided at below their actual value, run sensitivity analyses to check assumptions, and combine cost data with impact data to create a cost effectiveness ratio. Describe the metrics you will use to report costs and how you will explain the meaning of the cost effectiveness ratio to education stakeholders.

For additional resources, see https://ies.ed.gov/seer/cost_analysis.asp.

iii. National Leadership, Capacity Building, and Outreach Activities

Provide a timeline that shows when national leadership, capacity building, and outreach activities will take place in [Appendix B](#). Describe how those activities will inform one another and how they build from or feed into the center's focused program of research.

Discuss needs and challenges pertaining to data, access to research-based information, and research capacity faced by various stakeholders — including policymakers, state and local education leaders, teacher educators, teachers, and/or researchers — and how the center's national leadership activities would address these needs and challenges.

Describe the activities the center will engage in to identify the kinds of data collection that would be needed within Statewide Longitudinal Data Systems (SLDSs) to more adequately understand the dynamics of the K-12 general education teaching workforce as well as any products that will be developed to communicate these recommendations to state education leaders.

Describe how you will disseminate information about the K-12 Teacher Center's activities and research findings to various audiences through a website, policy briefs, and discussions of findings with state and local education leaders. Plan to host meetings and conferences to foster collaboration and communication on problems or issues of importance to K-12 educators, and to discuss possible approaches, programs, or policies to address these issues. Describe how you will share findings with U.S. Department of Education Technical Assistance Centers (<https://oese.ed.gov/resources/oese-technical-assistance-centers/>) and IES RELs (<https://ies.ed.gov/ncee/rel/>).

Discuss your plans for convenings with various stakeholders. Establish or take part in an existing forum composed of practitioners, policymakers, and researchers for identifying ongoing K-12 teacher research needs. Identify the information brokers providing recommendations on improving K-12 teacher recruitment and retention to the state and local agencies you will be working with and involve them in Center activities including dissemination.

Plan to meet with other IES-funded researchers at the Annual IES Principal Investigator (PI) Meeting. Discuss the major goals for meeting with them, how you will facilitate the exchange of information and ideas, and how you might work with them and IES to determine training or dissemination needs and to form appropriate plans to meet these needs. You might consider including a proposed agenda for the first meeting in your narrative or [Appendix B](#).

Discuss any opportunities you will provide for doctoral students, early career researchers, and other researchers, particularly those from diverse backgrounds and underrepresented communities, to contribute to the center's activities and gain meaningful research experience. These may take a variety of forms, such as opportunities to work on research carried out by the center, expand on existing studies, and/or design new studies to address new research questions; mentorship and networking opportunities; and/or online or in-person trainings.

iv. Management and Institutional Resources

Describe plans and procedures for the overall management of the K-12 Teacher Center and its various activities. Strong applications will demonstrate that you have sufficient research infrastructure and institutional capacity to carry out the focused program of research and the national leadership, capacity building, and outreach activities. Strong applications will also demonstrate that the

commitments of each partner show support for the implementation and success of the center.

Identify the management structure and procedures you will use to keep the work of the K-12 Teacher Center on track and ensure that the center is responsive to the concerns and needs of IES while also carrying out the focused program of research and national leadership activities.

Describe the capacity and resources you will use to support the work of the center at both the primary applicant institution and any subaward institutions, including your

- institution's capacity to manage a grant of this size
- immediate access to resources available at the primary institution and any subaward institutions
- plan for acquiring any resources that are not currently accessible, will require significant expenditures, and are necessary for the center to be successful
- access to specific offices and organizations that will support planned national leadership, capacity building, and outreach activities
- access to specific offices or organizations that will support dataset documentation and execution of the required Data Sharing and Management Plan (DSMP; see [Appendix A: Data Sharing and Management Plan](#))
- access to the settings and data sets necessary for the proposed research. Include letters of agreement, data licenses, or existing memoranda of understanding in [Appendix D](#) documenting this access.

Describe your capacity and plans to manage the K-12 Teacher Center.

- Discuss any prior experience managing a grant of this size, including coordinating the work of multiple partners; managing large budgets including subcontracts; running large meetings, conferences and videoconferences; conducting other national leadership activities; and annual reporting.
- Make clear how all research institutions and education settings that are involved in the R&D Center will work with one another, share information, and contribute to decision-making. It may be useful to include an organizational chart in [Appendix B](#).
- Discuss your plans and procedures for the overall management of these diverse stakeholders and activities, including coordination of communication and collaboration across settings and partner research institutions.
- If you plan to add research sites or partners once the R&D Center is established or over time, describe the process for identifying, recruiting, and establishing formal relationships with these sites and the timeline for this work.

Describe the steps you will take to ensure meaningful involvement from stakeholders in the education settings where you are working.

- Describe how you will involve education settings in identifying key issues for research, advising you on how best to implement research, discussing the implications of findings, and identifying areas for follow-on research. IES encourages including representatives from the education settings as personnel on the project and using grant funds to support their work on the project.
- Explain whether your relationship with these education settings and/or other stakeholder groups is new for this application or extends a prior relationship.

Include signed Letters of Agreement in [Appendix D](#) from the education settings where the initial research will take place (more settings can be added later); any education settings that will play a

role, either directly or in an advisory capacity, in the center's work; and all other research institutions to be included in the center's work as research partners. IES recommends you include regional research institutions based in or near the education settings where your work is taking place to help build their capacity to conduct and use research.

v. Personnel

Strong applications will demonstrate that the center team possess the appropriate skills and qualifications to carry out the proposed focused program of research, that the principal investigator and other key personnel possess the appropriate training and experience for their roles and responsibilities, and that they will commit sufficient time to competently implement the focused program of research and lead capacity building and outreach activities at a national level. In its research grant programs, IES is strongly committed to broadening participation, including personnel from underrepresented communities and diverse institutions.

Describe how the background and experience of the R&D Center team supports the conduct of the focused program of research and the national leadership activities with the population of learners that your Center addresses. Identify the key personnel who will be responsible for each of the specified activities in the proposed research plan and the amount of time they will devote to the project. Describe the following:

- Explain how the K-12 Teacher Center will integrate personnel from diverse research disciplines, literatures, and methods to address the education policy and leadership, pre-service and in-service experiences of K-12 classroom teaching, teacher recruitment and retention, intervention implementation monitoring/remediation, and psychometric aspects of the research questions.
- Describe key personnel experience with using statewide longitudinal data systems (SLDS) and linking datasets (for example, linking data from teacher preparation programs or state and district survey data with data from SLDS) in the proposed partner states as well as other states.
- Describe the plan for how key personnel will maintain their objectivity and promote transparency in conducting the proposed research and dissemination activities. Safeguards may include masking to condition, having separate teams of personnel for implementing the policy versus conducting the evaluation activities, and/or pre-registering the analytic plan. At a minimum, you should demonstrate that key personnel who are responsible for the random assignment, supervision of outcome data and coding, and data analysis are not involved in the development or distribution of the policy and do not have a financial interest in it.

3. Improving Outcomes in Elementary Science Education

Program Officers: Dr. Jennifer Schellinger (202-987-0765; Jennifer.Schellinger@ed.gov)
Dr. Christina Chhin (202-245-7736; Christina.Chhin@ed.gov)

a) Purpose

Under this topic, IES, in partnership with the National Science Foundation (NSF), requests applications to establish a National Research and Development (R&D) Center on Improving Outcomes in Elementary Science Education (Science Center). The Science Center's central purpose is (1) to improve measurement of learners' science achievement outcomes and (2) to generate evidence of the impact of elementary science interventions on learners' science achievement outcomes. A focus on elementary science increases opportunities to develop learners' early pathways to science, technology, engineering and mathematics (STEM) learning and careers, particularly among populations historically underrepresented in the STEM workforce, and to develop a well-informed citizenry.

National efforts to improve science education call for a comprehensive, multidimensional focus on science teaching and learning across K-12 education for all learners. Comprehensive science education provides high quality science learning opportunities across all grade levels. Multidimensional science teaching and learning approaches emphasize a deep understanding of core science topics, cross-cutting concepts, and scientific practices to answer questions and construct scientific explanations. Instruction and assessments aligned with this comprehensive, multidimensional approach are hypothesized to improve science achievement and engagement.

Although hundreds of science interventions have been developed and implemented over the past decade to improve elementary science teaching and learning, very few impact studies have been conducted to identify scalable interventions that improve young learners' science achievement. The What Works Clearinghouse (<https://ies.ed.gov/ncee/wwc/>) has identified only 24 elementary science impact studies that meet evidence standards over the last 20 years, compared to 98 studies focusing on elementary math. Many other studies also focus on learners' engagement such as behavioral, motivational, and affective outcomes without evaluating if or how engagement relates to improvements in science achievement. Further, few studies provide longitudinal evidence of the impact of science interventions on learners' accumulated science skills and knowledge over time. At the same time, there are few reliable and valid assessments to support elementary science instruction, especially those that can reliably measure learners' science achievement over time. In addition, current repositories of educational measurement tools, such as EdInstruments (<https://edinstruments.com/>), have limited information on existing science assessments.

The Science Center will address these gaps by conducting (1) a landscape analysis to examine existing measures of elementary science achievement, (2) a measurement study informed by the landscape analysis to refine and/or develop one or more high quality assessments of elementary science achievement, and (3) at least two impact studies to test the impact of elementary science interventions using both proximal and distal high-quality assessments of science achievement, including the newly developed/refined assessment(s) from the measurement study. The Science Center will also provide national leadership on elementary science education and build capacity in the field to conduct rigorous impact trials of science education interventions.

b) Award Limit

No more than \$15,000,000 (direct and indirect costs) over no more than 5 years.

- The duration and budget you request should reflect the actual time and amount of funding necessary to conduct your proposed scope of work.
 - Five percent of the center's budget **must** be set aside to conduct supplemental activities to be determined in cooperation with IES after the award is made.

- **IES will not make an award for an Improving Outcomes in Elementary Science Education Center that exceeds \$15,000,000 or that is for longer than 5 years.**

c) Requirements

Applications under the Improving Outcomes in Elementary Science Education Center topic **must** meet the requirements set out under **(a) Sample, Outcomes, and Setting** and **(b) R&D Center Narrative** in order to be responsive and sent forward for scientific peer review.

i. Sample, Outcomes, and Setting

(1) Sample

Your research **must** focus on elementary grade learners.

(2) Outcomes

Your research **must** include measures of learners' science achievement.

(3) Setting

Your research **must** be conducted in formal education settings in the United States, as described in the [General Requirements section](#).

ii. R&D Center Narrative

The five sections of the Science Center narrative **must** include the content described below. Please see the [recommendations section](#) for additional information about what to include.

(1) Significance of the Focused Program of Research

The purpose of this section is to explain the significance of the focused program of research.

You **must** describe

- the assessment you propose to develop and/or refine
- the purpose(s), population(s), and context(s) for which the assessment is intended
- the existing elementary science interventions that you propose to test and how they are being, will be, and/or were implemented
- any prior evidence of impact on learner education outcomes (or lack of evidence) for the elementary science interventions you propose to test

(2) Research Plan for the Focused Program of Research

The purpose of this section is to describe your sample, setting, research design, methods, and data analysis plans for each study in the focused program of research and demonstrate how they will allow you to answer your research questions.

You **must** describe plans

- to carry out a landscape analysis examining existing measures of elementary science achievement
- to carry out a measurement study to develop and/or refine at least one science achievement

assessment, document its validity and reliability, and establish its connection to state⁸ or other standardized tests of science achievement

- to evaluate the impact of at least two elementary science interventions on learner's science achievement and determine their cost and cost effectiveness

(3) National Leadership, Capacity Building, and Outreach Activities

The purpose of this section is to describe the national leadership, capacity building, and outreach activities that the center will conduct to promote the Center's national visibility and allow it to function as a trusted source of scientific research in Elementary Science Education.

You **must** describe how you will

- contribute to improved elementary science education practice and learner outcomes
- disseminate what the Science Center is learning to various stakeholders
- build the field's capacity to conduct elementary science education measurement and impact research

(4) Management and Institutional Resources

The purpose of this section is to describe the management and institutional resources that will support the work of the Science Center, including the organizational structure, institutional capacity, and access to resources needed to carry out and effectively manage the research and national leadership activities of the center.

You **must** describe the

- the organizational structure of the center
- plans and procedures for the overall management of the center
- resources to support the work of the center

(5) Personnel

The purpose of this section is to demonstrate that your team possesses the appropriate training and experience to carry out the research and national leadership activities and will commit sufficient time to the center.

You **must** describe your team

d) Recommendations for Strong Applications

IES provides recommendations intended to improve the quality of your application. Peer reviewers are asked to consider these recommendations in their evaluation of your application.

i. Significance of the Focused Program of Research

Explicitly state your research questions and specific aims as they relate to the landscape analysis, measurement study, and impact studies.

⁸ See https://nces.ed.gov/programs/statereform/tab8_41.asp

Describe how the proposed studies will contribute to our understanding of and ability to address the needs of all learners, including learners who have been historically underrepresented in STEM.

Describe any partnerships with education agencies that will be needed to carry out the proposed work. Including education agencies as partners makes it more likely that researchers focus on elementary science outcomes that are meaningful and useful to education practitioners and policymakers.

ii. Research Plan for the Focused Program of Research

For each of the Science Center's studies, demonstrate that the sample, setting, research design, methods, data analysis plans, and cost and cost effectiveness analysis plans for the impact studies, align with the research questions posed in the Significance section and that the center will be able to answer those questions with sufficient rigor.

Include a timeline for study activities in [Appendix B: Supplemental Charts, Tables, and Figures](#).

Discuss how your program of research conceptualizes education equity, and how the proposed design, sample, measurement, analysis, and reporting of each study align to that conceptualization. For additional resources see <https://ies.ed.gov/seer/equity.asp>.

For the *Landscape Analysis* describe and justify

- the elementary grades and measures to be studied
- criteria for including or excluding studies of elementary science achievement
- search procedures for ensuring that a high proportion of eligible studies, both published and unpublished, will be located and retrieved, with relevant information reported frequently enough and in a form that allows an adequate dataset to be constructed
- the coding scheme and procedures that will be used to extract data, including information about the psychometric properties of the elementary science achievement measures from the respective studies and the procedures for ensuring the reliability of the coding

For the *Measurement Study*, provide a detailed description of

- the target population of elementary learners that you will assess. Explain how your work with this sample(s) will contribute to a larger body of knowledge on measures of elementary learner achievement
- the procedure you will use to recruit your sample(s)
- the procedures for iteratively developing/refining, field testing, and selecting items to be used in the assessment and for obtaining representative responses to items. Include the procedures for establishing whether the items and the assessment as a whole are biased against groups within the intended population of use (for example, tests for differential item functioning, differential test functioning, and corresponding follow-up tests for bias)
- identification of the types of validity evidence to be collected with enough detail to demonstrate that they will provide evidence to address the claims of the assessment framework. Include information about their reliability, validity, and appropriateness for the proposed sample(s) and setting(s)
- the plan to collect information on the feasibility of implementing the fully developed assessment in the contexts in which it is intended to be used, and describe how you will use that information to modify the assessment to improve its scalability
- the data analysis plan including procedures for all quantitative and qualitative analyses

necessary to address your research questions

For the *Impact Studies*, provide a detailed description of

- the target population of elementary learners that your samples represent. Explain how your work with these samples will contribute to a larger body of knowledge on promising science interventions for the target population
- the procedures you will use to recruit a sample that represents your target population
- the setting(s) in which the research will take place (provide letters of agreement in [Appendix D](#)) and discuss how they will allow you to draw conclusions about the education settings your research is intended to inform
- the rationale for the research design you propose including an explanation of how your study will meet IES What Works Clearinghouse (WWC) design standards, with or without reservations, that are in effect at the time of RFA publication (<https://ies.ed.gov/ncee/wwc/Handbooks>). IES expects applicants to use the strongest research design available to address the proposed impact questions. The WWC currently only reviews studies that use one of the following designs:
 - Group RCTs
 - Sequential, multiple assignment, randomized trials (SMARTs)
 - Regression discontinuity designs (RDDs)
 - Quasi-experimental designs (QEDs) including cross-sectional group designs, comparative interrupted time series, difference-in-difference designs, and growth curve designs
 - Single case experimental designs (SCDs)
- When feasible, choose a study design that allows valid estimates to be calculated for different settings or groups within your proposed sample (particularly those who have been historically underrepresented in STEM)
- the plan for documenting implementation of the science elementary interventions being evaluated, including how you will
 - monitor/measure the fidelity of intervention implementation, including the following:
 - The processes, strategies, and materials needed to support its implementation.
 - develop and examine the psychometric properties of the fidelity of implementation measures.
 - The settings(s) where it is being, will be, and/or was implemented.
 - identify similar components in the comparison group.
 - examine implementation fidelity in relation to your outcomes of interest. The results of such analyses may be used to improve the quality and scalability of the policy through improvements in design, use, and support.

- the learner, educator, and/or setting characteristics that might affect implementation and how you will examine their influence
 - Describe how you will determine the factors that are associated with higher (or lower) fidelity as well as time to implementation fidelity and likelihood of sustainability. These factors could include characteristics of those who implement the policy; adaptations made in response to local context; as well as classroom, school, and district organizational factors.
- identify adaptations of the interventions when implemented by the educators in your evaluation. How will you identify the local contexts that lead to adaptations and whether these adaptations are correlated with education outcomes? Document, and identify opportunities to learn from adaptations of the interventions that were observed during implementation.
 - the power analysis for each causal analysis you propose. Each power analysis should demonstrate the statistical power of the research design to detect a reasonably expected and minimally important effect of the intervention on the focal learner outcomes. Justify why this level of effect would be expected and explain why this would be a practically important effect. Detail the procedure used to calculate either the power for detecting the minimum effect or the minimum detectable effect size
 - the high-quality measures, including the assessment developed or refined by the center, you will use including outcome constructs of interest to the proposed study. For all proposed measures, describe the importance, reliability, validity, sensitivity to change, appropriateness for the proposed sample and setting, and practical importance to educators, parents, and other decision makers. To the extent possible, include both short-term and long-term measures of learner outcomes
 - the data analysis procedures for all quantitative and qualitative analyses necessary to address your research questions, any analyses of groups of learners within your sample, analysis of baseline equivalence, and implementation fidelity
 - your cost and cost effectiveness analysis plan (see https://ies.ed.gov/seer/cost_analysis.asp), including
 - the level that is most relevant for the science interventions being studied, whether the state, district, school, classroom, or individual learner level.
 - how you will estimate costs using a societal perspective. Describe the cost method you will use, noting whether another perspective, such as that of a state/local education agency, will also be included.
 - how you will collect data about costs, including the time period for the cost data collection, the data collection assessments you will use, and the sources you will use to obtain national prices for resources and, if useful to a local audience, local prices.
 - a cost-effectiveness analysis is required only for the primary learner outcome(s). The analysis should be conducted at the level that is most relevant for the interventions being studied, whether the school, classroom, or individual learner level.
 - how you will calculate the cost of the resources, the cost of core components of the policy, and the total and incremental cost of implementing the

intervention. Include details such as how you will adjust prices where needed (for example, to account for inflation, geographic price differences, the time value of money), assign costs to resources that are provided at below their actual value, run sensitivity analyses to check assumptions, and combine cost data with impact data to create a cost effectiveness ratio.

- the metrics you will use to report costs and how you will explain the meaning of the cost effectiveness ratio to education stakeholders.

iii. National Leadership, Capacity Building, and Outreach Activities

Provide a timeline that shows when national leadership, capacity building, and outreach activities will take place in [Appendix B](#). Describe how those activities will inform one another and how they build from or feed into the center's focused program of research.

Discuss how the center's national leadership activities will address needs and challenges in elementary science education, including the specific foci within elementary science education instruction and measurement identified for the proposed Science Center.

Describe how you will disseminate information about the Science Center's activities and research findings to various audiences through a website, policy briefs, and discussions of findings with state and local education leaders. Plan to host meetings and conferences to foster collaboration and communication on problems or issues of importance to elementary science educators and to discuss possible approaches, programs, or policies to address these issues. Describe how you will share findings with the U.S. Department of Education's technical assistance centers (<https://oese.ed.gov/resources/oese-technical-assistance-centers/>) and IES Regional Educational Laboratories (RELs; <https://ies.ed.gov/ncee/rel/>).

Discuss your plans for convenings with various stakeholders. Consider activities that bring together different stakeholders or that help different audiences understand the needs, insights, and motivations of groups with whom they may not normally interact. For example, the Science Center could help researchers engage with educators to better understand the current education context, including the opportunities and challenges for implementing high quality science interventions and assessing learner outcomes.

Involve external advisors to help guide and provide feedback on the center's work.

Establish or take part in an existing forum composed of practitioners, policymakers, and researchers for identifying ongoing research needs. This forum should meet at least annually to discuss the latest findings on elementary science education, discuss ways of disseminating findings to practitioners and policymakers, and identify additional short and medium-term research goals that would be useful for improving practice. Describe what groups will be represented on the forum, how often the forum will meet, how the meetings will be structured, what kinds of information are to be gleaned from the forum, and how this information is to be disseminated through and used by the center. Identify existing forums, such as annual professional researcher and practitioner conferences, where the center can disseminate to technical and nontechnical audiences, including educators, administrators, policy makers, and other stakeholders.

Plan to meet with other IES-funded researchers at the Annual IES Principal Investigators Meeting. Discuss the major goals for meeting with them, how you will facilitate the exchange of information and ideas, and how you might work with them and IES to determine training or dissemination needs and to form appropriate plans to meet these needs. You might consider including a proposed agenda for the first meeting in your narrative or [Appendix B](#).

Build research and research use capacity in the settings where the Science Center is working by involving and training researchers from communities in or near where the research is taking place.

Discuss how this collaborative work will build infrastructure for continuing high quality science education research after the Science Center ends. Identify the knowledge, skills, and abilities that professionals (including institutional researchers, administrators, education researchers) need to build and discuss the activities, products, and resources the Science Center will create to address their needs.

Develop the next generation of education researchers in the center's topic area by providing training workshops, learning opportunities, and resources for graduate students, early career researchers, researchers new to the topic area, and state and local agency staff who are not directly involved in the work of the proposed R&D center. Discuss any opportunities you will provide for graduate students or early career researchers to contribute to center activities and gain meaningful experience.

Describe your plans to provide resources on 1) elementary science interventions with evidence for improving learners' science achievement, professional development that provides opportunities for educators to learn effective pedagogical strategies that lead to improved science achievement, and assessments that support science learning and 2) how to effectively partner with schools to conduct rigorous impact trials of science education interventions.

iv. Management and Institutional Resources

Strong applications will demonstrate that you have sufficient research infrastructure and institutional capacity to carry out the focused program of research and the national leadership, capacity building, and outreach activities. Strong applications will also demonstrate that the commitments of each partner show support for the implementation and success of the center.

Describe the resources you will use to support the work of the Science Center at both the primary applicant institution and any subaward institutions, including

- your institution's capacity to manage a grant of this size
 - include letters of agreement, data licenses, or existing memoranda of understanding in [Appendix D](#) documenting this access
 - your immediate access to resources available at the primary institution and any subaward institutions
 - your plan for acquiring any resources that are not currently accessible, will require significant expenditures, and are necessary for the center to be successful
 - your access to specific offices and organizations that will support planned national leadership, capacity building, and outreach activities
 - your access to specific offices or organizations that will support dataset documentation and execution of the required Data Sharing and Management Plan (DSMP; see [Appendix A: Data Sharing and Management Plan](#))
 - access to the settings, data sets, and platforms necessary for the proposed research

Describe your capacity and plans to manage the Science Center.

convincing letters convey that the organizations understand what their participation in the study will involve, such as annual surveys, assessments, and/or classroom observations. Include information about incentives for participation, if applicable

- Discuss any prior experience managing a grant of this size, including coordinating the work of multiple partners; managing large budgets including subcontracts; running large meetings, conferences and videoconferences; conducting other national leadership activities; and annual reporting.

v. Personnel

Make clear how all research institutions and education settings that are involved in the R&D Center will work with one another, share information, and contribute to decision-making. It may be useful to include an organizational chart in [Appendix B](#)

Discuss your plans and procedures for the overall management of these diverse stakeholders and activities, including coordination of communication and collaboration across settings and partner research institutions.

If you plan to add research sites or partners once the Science Center is established or over time, describe the process for identifying, recruiting, and establishing formal relationships with these sites and the timeline for this work.

Strong applications will demonstrate that the Science Center team possess the appropriate skills and qualifications to carry out the proposed research project, that the principal investigator and other key personnel possess the appropriate training and experience for their roles and responsibilities, and that they will commit sufficient time to competently implement the focused program of research and lead capacity building and outreach activities at a national level. In its research grant programs, IES is strongly committed to broadening participation, including personnel from underrepresented communities and diverse institutions.

Describe how the background and experience of the Science Center team supports the conduct of the focused program of research and the national leadership activities with the population of learners that your Center addresses. Identify the key personnel who will be responsible for each of the specified activities in the proposed research plan and the amount of time they will devote to the project. Describe how key personnel will maintain their objectivity and promote transparency in conducting the proposed research and dissemination activities. Intervention developers may serve as Principal Investigators or other key personnel as long as the necessary safeguards are in place and their involvement does not jeopardize the objectivity of the evaluation. Safeguards may include masking to condition, having separate teams of personnel for implementing the intervention versus conducting the evaluation activities, and/or pre-registering the analytic plan. At a minimum, demonstrate that key personnel who are responsible for the random assignment, supervision of outcome data and coding, and data analysis are not involved in the development or distribution of the policy and do not have a financial interest in it.

4. Using Generative Artificial Intelligence to Augment Teaching and Learning in Classrooms

Program Officer: Dr. Christina Chhin (202-245-7736; Christina.Chhin@ed.gov)

a) Purpose

Under this topic, IES requests applications to establish a National Research and Development (R&D) Center on **U**sing **G**enerative **A**rtificial **I**ntelligence to Augment Teaching and Learning in Classrooms (U-GAIN Center). Its central purpose is to examine how the use of generative artificial intelligence (AI) can make meaningful contributions to improving education processes and learners' education outcomes. Recent breakthroughs in generative AI have created opportunities to explore and develop new types of AI driven education technologies that have the potential to reshape the work of educators with tools to augment teacher practice and tools to directly support student learning. The best of these tools will permit well-trained educators to do what they do best: ensure each learner reaches their fullest potential and achieves the best possible education outcomes.

New developments in learning theories, practical applications, and empirical research are needed as the education field seeks to understand the circumstances in which use of generative AI can effectively support teaching and learning, while also attending to responsible AI practices that address fairness, accountability, transparency, ethics, privacy, and security. Generative AI has unique characteristics that require innovative research and development. Prior applications of AI in education often have straightforward evaluation criteria, such as comparing automated scoring to human scoring or comparing predicted dropout risk with actual dropout rates. In contrast, it is much more difficult to evaluate generative AI, especially in cases where the developed tool does not have a comparison to something already created by a human. While generative AI brings many new opportunities, it also poses new challenges and risks, including privacy and security concerns particularly around its use with young learners and among learners from historically marginalized populations. Therefore, responsible AI practices need to be embedded throughout the research and development process, particularly in the education context.

Through its focused program of research, the U-GAIN Center will (1) conduct at least one exploratory study to examine how generative AI is currently used in classrooms to improve teaching and learning outcomes, (2) informed by the exploratory study, develop at least one new or revise one existing educator- and/or learner-facing generative AI tool designed for use in classrooms, and (3) conduct a pilot study to assess the promise of the newly developed/revise generative AI tool for improving learners' education outcomes. In addition to the focused program of research, IES expects the U-GAIN Center to provide national leadership on the responsible use of generative AI to improve learner outcomes.

b) Award Limit

No more than \$10,000,000 (direct and indirect costs) over no more than 5 years.

- The duration and budget you request should reflect the actual time and amount of funding necessary to conduct your proposed scope of work.
 - Five percent of the center's budget **must** be set aside to conduct supplemental activities to be determined in cooperation with IES after the award is made.
- **IES will not make an award for a U-GAIN Center that exceeds \$10,000,000 or that is for longer than 5 years.**

c) Requirements

Applications under the U-GAIN Center topic **must** meet the requirements set out under (a) **Sample, Outcomes, and Setting** and (b) **R&D Center Narrative** in order to be responsive and sent forward for scientific peer review.

i. Sample, Outcomes, and Setting

(1) Sample

- Your research **must** focus on PreK, K-12, postsecondary, and/or adult learners
 - You may focus on the entire spectrum of PreK to adult learners or a subset of grade/age levels.

(2) Outcomes

- One or more of the following learner academic outcomes **must** be measured as part of the proposed research:
 - For **prekindergarten** – school readiness outcomes which include pre-reading; language; vocabulary; early-STEM (science, technology, engineering, and/or mathematics) knowledge; English language proficiency; digital literacy; and/or social, emotional, and behavioral competencies (including self-regulation and/or executive function) that prepare young children for school
 - For **kindergarten through Grade 12** – learning, achievement, and/or higher order thinking in the academic content areas of literacy, STEM, and/or social studies;⁹ English language proficiency; career and technical education (CTE) attainment;¹⁰ digital literacy; and/or progression through education systems as indicated by course and grade completion, retention, high school graduation, and/or dropout
 - For **postsecondary education** – learning, achievement, and/or higher order thinking in postsecondary courses; and/or access to, persistence in, progress through, and/or completion of postsecondary education, which includes developmental education and corequisite support courses, bridge programs, for-credit and non-credit programs that lead to occupational credentials and certificates, and for-credit programs that lead to associate or bachelor's degrees
 - For **adult education** – achievement in literacy, English language proficiency, and/or numeracy, as well as access to, persistence in, progress through, and completion of adult education courses and programs including the full range of course and program types described in Title II of the Workforce Innovation and Opportunity Act of 2015 (WIOA; <https://www.dol.gov/agencies/eta/wioa>)
- If you are examining the role of educators in improving learners' academic outcomes, you **must** also measure educator knowledge, skills, beliefs, behaviors, and/or practices.
- If you are examining learners' social, emotional, and/or behavioral competencies and/or efforts to improve them, you **must** also include measures of these competencies.

⁹ Social studies outcomes are defined as a learner's understanding of government structures and processes and how to be an engaged and knowledgeable citizen through skills and knowledge in civics, citizenship, geography, history, and economics.

¹⁰ CTE attainment is defined as an indicator of mastery of CTE content or skills such as CTE course grades or credits earned, technical skills, assessment scores, industry certification, or employment outcomes in a field related to the CTE training.

(3) Setting

- Your research **must** be conducted in formal education settings in the United States, as described in the [General Requirements section](#).

ii. R&D Center Narrative

The five sections of the U-GAIN center narrative **must** include the content described below. Please see the [recommendations section](#) for additional information about what to include.

(1) Significance of the Focused Program of Research

The purpose of this section is to explain the significance of the focused program of research.

You **must** describe the following:

- An identified need in education practice that the U-GAIN Center will address through its focused program of research.
- The generative AI use cases that will be examined in exploratory study of the focused program of research.

(2) Research Plan for the Focused Program of Research

The purpose of this section is to describe your sample, setting, research design, methods, and data analysis plans for each study in the focused program of research and demonstrate how they will allow you to answer your research questions.

You **must** describe plans

- to carry out at least one exploratory study examining the current use of generative AI in classrooms.
- to carry out the development and pilot testing of at least one educator- and/or learner-facing generative AI tool in classrooms and to determine its cost.

(3) National Leadership, Capacity Building, and Outreach Activities

The purpose of this section is to describe the national leadership, capacity building, and outreach activities that the center will conduct to promote the U-GAIN Center's national visibility and allow it to function as a trusted source of scientific research in generative AI.

You **must** describe how you will

- contribute to improved use of generative artificial intelligence (AI) to improve education processes and learners' education outcomes
- disseminate what the U-GAIN Center is learning to various stakeholders
- build the field's capacity to conduct research in generative AI as it applies to education processes and learners' education outcomes

(4) Management and Institutional Resources

The purpose of this section is to describe the management and institutional resources that will support the work of the U-GAIN Center, including the organizational structure, institutional capacity, and access to resources needed to carry out and effectively manage the research and national leadership activities of the center.

You **must** describe the

- the organizational structure of the center
- plans and procedures for the overall management of the center
- resources to support the work of the center

(5) Personnel

The purpose of this section is to demonstrate that your team possesses the appropriate training and experience to carry out the focused program of research and national leadership activities and will commit sufficient time to the center.

You **must describe** your team.

d) Recommendations for Strong Applications

IES provides recommendations intended to improve the quality of your application. Peer reviewers are asked to consider these recommendations in their evaluation of your application.

i. Significance of the Focused Program of Research

Strong applications will address a significant challenge in the use of generative AI in education and provide a compelling theoretical and empirical rationale for the project activities.

Describe how the proposed project will contribute to our understanding of and ability to address the needs of all learners, including historically underserved learners. Describe any partnerships with education agencies, education technology developers, education publishing companies, assessment companies, or industry leaders that will be needed to carry out and included in the proposed work. Including education agencies and other partners makes it more likely that researchers focus on factors and outcomes that are meaningful and useful to education practitioners and policymakers.

Explicitly state your research questions and approach to addressing the aims of the exploration study and the development and innovation study.

Exploratory Study

Describe the generative AI use cases that you propose to study and the relationship(s) you expect them to have with learner education outcomes. Identify aspects of the education setting and characteristics of learners or educators that may change the nature of the relationship between the factors of interest and learner outcomes.

Describe how the exploratory study will inform the Development and Innovation study.

Development and Innovation Study

It is expected that the Development and Innovation study will build, in part, on the findings from the Exploratory study. Therefore, to the extent possible, describe the generative AI tool(s) you propose to develop or refine, including

- the theory of change that will guide your development/refinement and testing of the tool. The theory of change should be supported by theoretical frameworks and empirical evidence that illustrate how and why the desired change in learner outcomes is expected to happen
- the core features of the tool, including its essential practices and structural elements (see https://ies.ed.gov/seer/core_components.asp)
- why the tool is likely to be an improvement over what already exists. For example, is it more likely to be scaled-up because it is more user-friendly and less expensive to implement? Is it likely to produce significantly better education outcomes? What evidence exists that there is a need for this approach and that people will use it?
- the potential market for the tool
- what resources and organizational structure would be necessary for its wide adoption and implementation and its potential for commercialization
- for adaptive AI tools, describe the rationale for decision points, tailoring variables, decision rules, and intervention options

ii. Research Plan for the Focused Program of Research

Strong applications will demonstrate that the sample, setting, research design, methods, data analysis plans, power analyses, and cost analysis plans align with the research questions posed in the Significance section and that the project will be able to answer those questions with sufficient rigor.

Include a timeline for study activities in [Appendix B: Supplemental Charts, Tables, and Figures](#).

Discuss how your study conceptualizes education equity, and how the proposed study's design, sample, measurement, analysis, and reporting align to that conceptualization. For additional resources see <https://ies.ed.gov/seer/equity.asp>.

Sample and Setting

Describe the population of learners that your sample represents. Explain how your work with this sample will contribute to a larger body of knowledge on promising use of generative AI tools for the target population.

Describe the procedures you will use to recruit a sample that represents your target population. Describe and justify the inclusion/exclusion criteria you will use during sample recruitment and discuss how these may narrow the target population you propose to study and influence the generalizability of the results to the target population. Through intentional sampling or other means, your proposed study should permit ready generalization of its findings to your population of interest. For additional resources see <https://ies.ed.gov/seer/generalization.asp>. IES does not expect individual projects to be generalizable to the U.S. population as a whole. Your target population may represent a very narrow segment of the larger U.S. population.

Describe the setting(s) in which the research will take place (provide letters of agreement in [Appendix D](#)), including the size and characteristics of the setting and/or the surrounding community, and discuss how this will allow you to draw conclusions about the education settings your research is intended to inform.

Research Design, Methods, and Data Analysis Plans

Describe your research design with enough detail to demonstrate how it will address your research questions. Use a mixed methods approach whenever possible.

For the *Exploratory Study*

- Describe the methods you will use and how they will inform your research questions and/or specific aims.
- If analyses of existing data are proposed, describe the datasets which you have access to and include a letter that demonstrates access to the dataset(s) in [Appendix D](#).

For the *Development and Innovation Study*

- Describe how you will develop/refine the Generative AI tool. IES recommends using an iterative process to develop or refine the proposed generative AI tool. If appropriate, we also encourage you to use a digital learning platform to support this process.
- Describe how you will collect information on the acceptability, usability, and feasibility of implementing the generative AI tool. Address how you will use this information to
 - assess product-market fit
 - make adaptations as needed to ensure the tool meets the needs of the intended end users
 - make adjustments to the tool to improve its future scaling
 - decide if the tool is a good fit for the setting in which it is being implemented. How will the new tool be integrated into the procedures, pedagogical practices, digital learning platforms, curricula, and/or assessments currently being used?
 - identify the amount of time and training needed to adopt and sustain implementation of the tool. Describe how you will measure implementation fidelity of the developed generative AI tool, including any training that is provided to support implementation.
- Describe the methods will you use to ensure that the generative AI tool creates safe, valid, and unbiased results for the intended learners. Provided a detailed plan for how you will evaluate and mitigate sources of bias and ensure fairness for different populations of learners. Describe
 - the ways that you will be transparent in how the tool functions and in the research findings
 - procedures that will promote ethical decision-making throughout the development cycle
- While more detail about the center's data sharing plans and adherence to open science principles will be included in [Appendix A: Data Sharing and Management Plan](#), you should also describe within the narrative how the center will make datasets or analytic code available for other researchers. These resources should enable the replication of results and extension to adjacent projects. In addition, to promote transparency and interpretability, you should describe the methods used for the dataset, including the data collection, data transformations, and algorithmic choices that are made.
- Describe how you will pilot the tool to determine its potential benefit for learner education outcomes.
 - If appropriate, consider using a digital learning platform to support the pilot test of promise.
 - Propose the most rigorous research design possible given what you will be piloting, with whom, and under what conditions. Provide a rationale for the research design you propose for your pilot study.

- Detail the procedure used to calculate either the statistical power for detecting the minimum effect or the minimum detectable effect size. If the pilot study will be underpowered, describe what can be learned about the potential benefits for learner education outcomes given the known limits on statistical power.
- Describe your cost analysis plan (see https://ies.ed.gov/seer/cost_analysis.asp), including
 - the level that is most relevant for the developed generative AI tool, whether the school, classroom, or individual learner level
 - how you will estimate costs using a societal perspective. Describe the cost method you will use, noting whether another perspective, such as that of the local education agency, will also be included
 - how you will collect data about costs, including the time period for the cost data collection, the data collection assessments you will use, and the sources you will use to obtain national prices for resources and, if useful to a local audience, local prices
 - how you will calculate the cost of the resources, the cost of core components of the tool, and the total and incremental cost of implementing the tool. Include details such as how you will adjust prices where needed (for example, to account for inflation, geographic price differences, the time value of money), assign costs to resources that are provided at below their actual value, and run sensitivity analyses to check assumptions
 - the metrics you will use to report costs to education stakeholders

For both the *Exploratory* and *Development and Innovation Studies*

High-quality Measures

Clearly define the constructs of interest in the proposed studies. Describe the importance, reliability, and validity of all measures proposed, including learner outcomes, educator outcomes, and educator and education system characteristics. For additional resources see <https://ies.ed.gov/seer/outcomes.asp>.

If you need to develop a measure, describe what you will develop, why it is necessary, how it will be developed, and the process for checking its reliability and validity. It is also critical that you explain how this measurement work will not compromise your ability to achieve the primary aims of the center's focused program of research.

Data Analysis Plans

For each study proposed, provide a detailed data analysis plan for all quantitative and qualitative analyses necessary to address your research questions. Provide separate descriptions for all analyses of factors that mediate or moderate the relationships of interest.

Describe and justify the statistical models to be used, including how they address the multilevel nature of education data and how well they control for selection bias, if appropriate.

If you intend to link multiple datasets, provide sufficient detail for reviewers to judge the feasibility of the linking plan.

Describe what approaches you will take to ensure that non-experts have trust in the results and that the decisions made by the generative AI tool are valid, such as model interpretability and post-hoc measures.

iii. National Leadership, Capacity Building, and Outreach Activities

Provide a timeline that shows when national leadership, capacity building, and outreach activities will take place in [Appendix B](#). Describe how those activities will inform one another and how they build from

or feed into the center's focused program of research.

- Describe how the national leadership activities will build from and feed into the focused program of research and how they will help address the needs of a wide range of stakeholders.
- Establish and maintain a website that describes the center's goals and activities and makes its research reports and other products readily available for download. Communicate with policymakers, practitioners, researchers, the media, parents, and the general public about the center's work. Use technology such as webinars, podcasts, and social media to broaden the reach of the center at a relatively low cost. Describe the center website you will design, including its content and the audiences you intend to reach.
- Discuss ways that the center could provide timely, actionable information to address high-priority or immediate needs that educators are facing. Identify the information brokers providing recommendations on the use of AI in classrooms to the education settings you will be working with and involve them in center activities including dissemination.
- Consider activities that bring together different stakeholders or that help different audiences understand the needs, insights, or motivations of groups with whom they may not normally interact. For example, the U-GAIN Center could help developers and industry leaders engage with educators to better understand the current education context, including the opportunities, challenges, and risks with integrating generative AI into teaching and learning.
- Involve external advisors to help guide and provide feedback on the center's work.
- Establish or take part in an existing forum composed of practitioners, policymakers, and researchers for identifying ongoing research needs. This forum should meet at least annually to discuss the latest findings on education related to the U-GAIN Center's area of focus, discuss ways of disseminating findings to practitioners and policymakers, and identify additional short- and medium-term research that would be useful for improving practice. Describe what groups will be represented on the forum, how often the forum will meet, how the meetings will be structured, what kinds of information are to be gleaned from the forum, and how this information is to be disseminated through and used by the center. Identify existing forums, such as annual professional researcher and practitioner conferences, where the center can disseminate to technical and nontechnical audiences, including educators, administrators, policy makers, and other stakeholders.
- Build research and research use capacity by involving and training researchers from communities in or near where the research is taking place, for example faculty from regional colleges and universities or research analysts based in state and local agencies. Discuss how this collaborative work will build infrastructure for continuing high quality education research on the use of generative AI in classrooms after the U-GAIN Center ends.
- Host meetings and conferences (both in-person and virtual) to foster collaboration and communication on problems or issues of importance to key stakeholders, and to discuss possible approaches, programs, or policies to address these issues.
- Develop resources and provide training to build the capacity of education settings to take part in and/or to use high-quality, scientific research to improve learner education outcomes.

Describe how you will develop the next generation of education researchers to conduct research in generative AI as it applies to education processes and learners' education outcomes by providing training workshops, learning opportunities, and resources for graduate students, early career researchers, researchers new to the topic area, and state and local agency staff who are not directly involved in the work of the proposed R&D Center. Discuss any opportunities you will provide for graduate students or early career researchers to contribute to the center activities and gain meaningful

experience.

Identify the knowledge, skills, and abilities that professionals (including institutional researchers, administrators, education researchers) need to build and discuss the activities, products, and resources the center will create to address their needs.

Plan to meet with other IES-funded researchers at the Annual IES Principal Investigators Meeting. Discuss the major goals for meeting with them, how you will facilitate the exchange of information and ideas, and how you might work with them and IES to determine training or dissemination needs and to form appropriate plans to meet these needs. You might consider including a proposed agenda for the first meeting in your narrative or [Appendix B](#).

iv. Management and Institutional Resources

Strong applications will demonstrate that you have sufficient research infrastructure and institutional capacity to carry out the focused program of research and the national leadership, capacity building, and outreach activities. Strong applications will also demonstrate that the commitments of each partner show support for the implementation and success of the center.

Describe the resources you will use to support the work of the center at both the primary applicant institution and any subaward institutions, including

- your institution's capacity to manage a grant of this size
- your immediate access to resources available at the primary institution and any subaward institutions
- your plan for acquiring any resources that are not currently accessible, will require significant expenditures, and are necessary for the center to be successful
- your access to specific offices and organizations that will support planned national leadership, capacity building, and outreach activities
- your access to specific offices or organizations that will support dataset documentation and execution of the required Data Sharing and Management Plan (DSMP; see [Appendix A: Data Sharing and Management Plan](#))
- access to the settings, data sets, and platforms necessary for the proposed research
 - include letters of agreement, data licenses, or existing memoranda of understanding in [Appendix D](#) documenting this access
 - convincing letters convey that the organizations understand what their participation in the study will involve, such as annual surveys, assessments, and/or classroom observations. Include information about incentives for participation, if applicable

Describe your capacity and plans to manage the U-GAIN Center.

- Discuss any prior experience managing a grant of this size, including coordinating the work of multiple partners; managing large budgets including subcontracts; running large meetings, conferences and videoconferences; conducting other national leadership activities; and annual reporting.
- Make clear how all research institutions and education settings that are involved in the R&D Center will work with one another, share information, and contribute to decision-making. It may be useful to include an organizational chart in [Appendix B](#).
- Discuss your plans and procedures for the overall management of these diverse stakeholders and

activities, including coordination of communication and collaboration across settings and partner research institutions.

- If you plan to add research sites or partners once the R&D Center is established or over time, describe the process for identifying, recruiting, and establishing formal relationships with these sites and the timeline for this work.
- Describe the steps you will take to ensure meaningful involvement from stakeholders in the education settings where you are working.
 - Describe how you will involve education settings in identifying key issues for research, advising you on how best to implement research, discussing the implications of findings, and identifying areas for follow-on research.
 - Explain whether your relationship with these education settings and/or other stakeholder groups is new for this application or extends a prior relationship.

Include signed Letters of Agreement in [Appendix D](#) from the education settings where the initial research will take place (more settings can be added later); any education settings that will play a role, either directly or in an advisory capacity, in the center's work; and all other research institutions to be included in the center's work as research partners. IES recommends you include regional research institutions based in or near the education settings where your work is taking place to help build their capacity to conduct and use research.

v. Personnel

Strong applications will demonstrate that the center team possess the appropriate skills and qualifications to carry out the proposed research project, that the principal investigator and other key personnel possess the appropriate training and experience for their roles and responsibilities, and that they will commit sufficient time to competently implement the focused program of research and lead capacity building and outreach activities at a national level.

In its research grant programs, IES is strongly committed to broadening participation, including personnel from underrepresented communities and diverse institutions.

Describe how the background and experience of the U-GAIN Center team supports the conduct of the focused program of research and the national leadership activities with the population of learners that your Center addresses. Identify the key personnel who will be responsible for each of the specified activities in the proposed research plan and the amount of time they will devote to the project. Describe how key personnel will maintain their objectivity and promote transparency in conducting the proposed research and dissemination activities.

Part III: Preparing Your Application

A. Overview

The application contents—individual forms and their PDF attachments—represent the body of an application to IES. Read the IES Application Submission Guide (https://ies.ed.gov/funding/submission_guide.asp) to learn how to prepare a complete application that is submitted on time through Grants.gov (<https://www.grants.gov/>).

B. General Formatting

To ensure that reviewers can read your application and that all applicants have similar expectations for length and space, IES specifies the following formatting conventions. Adherence to type size and line spacing requirements is necessary so that no applicant will have an unfair advantage by using small type or by providing more text in their applications. These requirements apply to the PDF file as submitted, unless otherwise specified. In order for an application to be compliant and sent forward for review, the applicant should ensure that each narrative section follows both the page limit maximums and the formatting guidelines below unless otherwise specified.

1. *Page and Margin Specifications*

For all IES grant applications, a “page” is 8.5 in. x 11 in. on one side only with 1-inch margins at the top, bottom, and both sides.

2. *Page Numbering*

Add page numbers using the header or footer function and place them at the bottom or upper right corner for ease of reading.

3. *Spacing*

Text must be single spaced.

4. *Type Size (Font Size)*

Type must conform to the following three requirements:

- The height of the letters must not be smaller than a type size of 12-point.
- Type density, including characters and spaces, must be no more than 15 characters per inch (cpi). For proportional spacing, the average for any representative section of text must not exceed 15 cpi.
- Type size must yield no more than 6 lines of type within a vertical inch.

You should check the type size using a standard device for measuring type size, rather than relying on the font selected for a particular word processing/printer combination. Small type size makes it difficult for reviewers to read the application; consequently, the use of small type will be grounds for IES to return the application without scientific peer review.

As a practical matter, if you use a 12-point Times New Roman font without compressing, kerning, condensing, or other alterations, and use footnotes sparingly, if at all, the application will typically meet these requirements. Readability should guide your selection of an appropriate font and your use of footnotes.

5. *Citations*

Use the parenthetical author-date style for citations rather than numeric citations that correspond to the reference list.

6. Graphs, Diagrams, and Tables

Use black and white in graphs, diagrams, tables, and charts. If color is used, check that the material reproduces well if printed or photocopied in black and white.

Text in figures, charts, and tables, including legends, may be in a type size smaller than 12-point but must be readily legible.

C. Required and Optional Appendices

The required R&D Center Narrative (Significance of the Focused Program of Research; Research Plan for the Focused Program of Research; National Leadership, Capacity Building, and Outreach Activities; Management and Institutional Resources; and Personnel) that is described for each R&D Center (see [Part II: R&D Center Requirements and Recommendations](#)) is followed by several appendices. One of these appendices are required, and the others are optional. When you submit your application through Grants.gov, you will create a single PDF file that contains the R&D center narrative and all appendices and include it as an attachment in the application package. Include appendices in alphabetical order and simply skip an appendix if it is not required for your application or if you choose not to include one of the optional appendices. See the IES Application Submission Guide (https://ies.ed.gov/funding/submission_guide.asp) for more information about preparing and submitting your application using the required application package for this competition through Grants.gov (<https://www.grants.gov/>).

The R&D center narrative and appendices are critical parts of the IES application because they include the substantive content that the peer reviewers will evaluate for theoretical and practical significance and scientific merit.

1. Appendix A: Data Sharing and Management Plan (Required)

You **must** include Appendix A. Appendix A must meet the general formatting guidelines and be **no more than five pages**. If Appendix A exceeds this page limit, IES will remove any pages after the fifth page of the Appendix before it is forwarded for scientific peer review.

Include your Data Sharing and Management Plan (DSMP) in Appendix A. **This is the only material that may be included in Appendix A; all other material will be removed prior to review of the application.**

IES recommends that you address the following in your DSMP. See the Implementation Guide for Public Access to Research Data (https://ies.ed.gov/funding/datasharing_implementation.asp) and our FAQs (https://ies.ed.gov/funding/datasharing_faq.asp) for additional guidance on developing a DSMP.

When the principal investigator (PI) and authorized organization representative (AOR) sign the cover page of the grant application, they will be assuring compliance with the IES Policy Regarding Public Access to Research (<https://ies.ed.gov/funding/researchaccess.asp>) as well as other policies and regulations governing research awards. This entails uploading full text of accepted or published manuscripts to ERIC that are based on IES-funded data, as well as the sharing of data.

Once the DSMP is approved by IES, the PI and the institution are required to carry it out and to report progress and problems through the regular reporting channels. Compliance with IES data sharing requirements is expected even if the final dataset may not be completed and prepared for data sharing until after the grant has been completed. In cases where the PI/grantee is non-compliant with the requirements of the data sharing policy or DSMP, subsequent awards to individuals or institutions may be affected. By addressing the items identified below, your DSMP describes how you will meet the requirements of the IES policy for data sharing and adopt best practices for adherence to open science principles.

The DSMP should describe the following:

- The pre-registration repository where you will pre-register your study within the first year of the project, following the Standards for Excellence in Education Research (SEER; <https://ies.ed.gov/seer/preregistration.asp>).
- The data repository where you plan to share your data, and an indication of the selected repository's adherence with the National Science and Technology Council document entitled "Desirable Characteristics of Data Repositories for Federally Funded Research" (<https://repository.si.edu/handle/10088/113528>).
- The type of data to be shared.
- The approach you will take to curating, cleaning, and preparing data for sharing, taking into consideration guidance from IES's Sharing Study Data: A Guide for Education Researchers (<https://ies.ed.gov/ncee/pubs/2022004/>).
- The format of the final dataset.
- Dataset documentation to be provided, including any decisions made about the data that would be important in replicating the results. If you are applying for the U-GAIN Center, dataset documentation should also include information about data transformations and algorithmic choices that are made.
- Intentions to share analysis code to support reproducibility, including format and location.
- Procedures for managing and for maintaining the confidentiality of Personally Identifiable Information.
- Roles and responsibilities of project or institutional staff in the management and retention of research data, including a discussion of any changes to the roles and responsibilities that will occur should the project director/principal investigator and/or co-project directors/co-principal investigators leave the project or their institution.
- Expected schedule for data sharing, including how long the data will remain accessible (no later than publication of findings in a peer-reviewed publication and available for at least 10 years) and acknowledgement that the timeframe of data accessibility will be reviewed at the annual progress reviews and revised as necessary.
- Whether or not users will need to sign a data use agreement and, if so, what conditions they must meet.
- Any circumstances that prevent all or some of the data from being shared. This includes data that may fall under multiple statutes and, hence, must meet the confidentiality requirements for each applicable statute including data covered by Common Rule for Protection of Human Subjects, the Family Educational Rights and Privacy Act (FERPA), and the Health Insurance Portability and Accountability Act (HIPAA). Approaches to disseminating the availability and location of data to support discoverability for reuse purposes.
- The costs associated with implementation of the DSMP can be covered by the grant and should be included in the budget and explained in the budget narrative.

IES program officers will be responsible for reviewing the completeness of the proposed DSMP. If your application is being considered for funding based on the scores received during the scientific review process but your DSMP is determined incomplete, you will be required to provide additional detail regarding your DSMP.

2. Appendix B: Supplemental Charts, Tables, and Figures (Optional)

Appendix B **must** meet the general formatting guidelines and be **no more than 15 pages**. If Appendix B exceeds this page limit, IES will remove any pages after the 15th page before it is forwarded for scientific peer review. In Appendix B, you may include figures, charts, or tables with supplementary information like a timeline for center activities, a diagram of the management structure of your center, or examples of measures used to collect data for your project such as individual test items, tests, surveys, and observation and interview protocols.

These are the only materials that may be included in Appendix B; all other material will be removed prior to review of the application.

3. Appendix C: Examples of Program, Practice, Policy, or Assessment Materials (Optional)

Appendix C **must** meet the general formatting guidelines and be **no more than 10 pages**. If Appendix C exceeds this page limit, IES will remove any pages after the 10th page before it is forwarded for scientific peer review. If you are proposing to explore, develop, evaluate, or validate a program, practice, policy, or assessment you may include examples of it such as curriculum materials, computer screen shots, assessment items, or other materials used in the program, practice, policy, or assessment to be explored, developed, evaluated, or validated.

These are the only materials that may be included in Appendix C; all other material will be removed prior to review of the application.

4. Appendix D: Letters of Agreement (Required for Rural and K-12 Teacher Centers)

There is **no recommended page length** for Appendix D. Use this appendix to provide copies of letters of agreement from schools, colleges, districts, platform developers, and/or other settings or data sources that will be a part of or will provide data for the proposed research and/or individuals who will serve as consultants. Ensure that the letters reproduce well so that reviewers can easily read them. Do not reduce the size of the letters. See the IES Application Submission Guide (https://ies.ed.gov/funding/submission_guide.asp) for guidance regarding the size of file attachments.

Letters of agreement should include enough information to make it clear that the author of the letter understands the nature of the time commitment and timing of participation, as well as the required space and personnel resources that the organization is prepared to contribute to the center and the ways that organization personnel will be expected to coordinate with the center team (such as quarterly meetings with administrative staff, weekly research team observations in classrooms) if the application is funded. Letters of agreement regarding the provision of data should make it clear that the author of the letter will provide the data described in the application for use in the proposed research and in time to meet the proposed schedule.

These are the only materials that may be included in Appendix D; all other material will be removed prior to review of the application.

D. Other Narrative Content

In addition to the R&D center narrative (see [Part II: R&D Center Requirements and Recommendations](#)) and required and optional appendices (see above), you will also prepare a project summary/structured abstract, a bibliography and references cited, an exempt or non-exempt research on human subjects narrative, and biosketches for key personnel and consultants to include as file attachments in your application. See the IES Application Submission Guide (https://ies.ed.gov/funding/submission_guide.asp) for more information

about preparing and submitting your application using the required application package for this competition on Grants.gov (<https://www.grants.gov/>).

1. R&D Center Summary/Structured Abstract

You **must** submit the R&D Center summary/structured abstract as a separate PDF attachment in the application package. If your R&D Center is recommended for funding, IES will use this abstract as the basis for the online abstracts that we post when new awards are announced. We recommend that the project summary/structured abstract be two-pages long and follow the format used for IES online abstracts (<https://ies.ed.gov/funding/grantsearch/>).

Title

- **Title:** Distinct, descriptive title for the center.
- **R&D Center Topic:** Identify the R&D Center topic to which you are applying (see [Part II](#)). This information should match the topic code entered for Item 4b: Agency Routing Number on the SF 424 Application for Federal Assistance form (see the IES Application Submission Guide https://ies.ed.gov/funding/submission_guide.asp and the topic codes in [Part VI](#) for more information).

R&D Center Summary

The purpose of the R&D Center summary is to provide a high-level overview of the focused program of research and the national leadership, capacity building, and outreach activities that is accessible to a range of audiences, such as policymakers, practitioners, and the general public. This section should use short, active sentences to briefly describe the significance of the center, center activities, and the intended outcomes.

- **Purpose:** A brief description of the purpose of the R&D Center and the significance of the focused program of research. This should include why the research is important, and what this center will do to address the need. This section should also address the general expected outcomes of the focused program of research and of the national leadership, capacity building, and outreach activities.
- **Project Activities:** An overview of the focused program of research and the center's national leadership, capacity building, and outreach activities.
- **Products:** A brief description of the expected products of the center.

Structured Abstract

The purpose of the structured abstract is to provide key details about the center's activities. This section is most likely to be used by other researchers but should be written in a way that is accessible to anyone who wants more information about the center.

- **Sample:** A brief description of the sample including number of participants; the composition of the sample including age or grade level, race/ethnicity, or disability status as appropriate; and the population the sample is intended to represent
- **Outcomes:** A brief description of key measures, including learner education outcomes and the constructs being measured
- **Setting:** A brief description of the location (identified at the state level) where the center's activities will take place and other important characteristics of the locale, such as whether it is rural or urban

- **Research Design and Methods:** A brief description of the major features of the design and methodology for each study proposed for the focused program of research, describing the design and methods year by year, in terms of steps or phases as applicable
- **Data Analytic Strategy:** A brief description of the data analytic strategies that the center team will use to answer the research questions
- **Cost Analysis:** If applicable, a brief description of the cost and/or cost-effectiveness analyses planned
- **Related IES Projects:** A list of the IES-issued award number and/or corresponding online abstract link (URLs) to completed or ongoing IES-funded projects that are related to the proposed center

See our online search engine of funded research grants (<https://ies.ed.gov/funding/grantsearch/>) for examples of the content to be included in your project summary/structured abstract and to search for award numbers and URLs.

2. Bibliography and References Cited

You **must** submit the bibliography and references cited as a separate PDF attachment in the application package. There is **no recommended page length** for the bibliography and references cited. You should include complete citations, including the names of all authors (in the same sequence in which they appear in the publication), titles of relevant elements such as the article/journal and chapter/book, page numbers, and year of publication for literature cited in the R&D center narrative. As a reminder, you should use the author-date style for citations in the R&D center narrative (see [Part VI B.5 Citations](#) for more information).

3. Human Subjects Narrative

You **must** submit an exempt or non-exempt human subjects narrative as a separate PDF attachment in the application package. We do not recommend a page length for the human subjects narrative. See *Information About the Protection of Human Subjects in Research Supported by the Department of Education* (<https://www2.ed.gov/policy/fund/guid/humansub/hrsnarrative1.html>) for a brief overview of principles, regulations, and policies which affect research involving human subjects in research activities supported by the Department.

The U.S. Department of Education does not require certification of IRB approval at the time you submit your application. However, if an application that involves non-exempt human subjects research is recommended for funding, the designated U.S. Department of Education official will request that you obtain and send the certification to the Department within 30 days of the formal request from the Department.

4. Biographical Sketches for Key Personnel

You **must** submit a biographical sketch for each person named as key personnel in your application. You may also submit biographical sketches for consultants (optional). Each biographical sketch (an abbreviated CV plus current and pending support information) **must be no more than five pages in length, and this five-page limit includes current and pending support information**. If a biographical sketch exceeds this page limit, IES will remove any pages after the fifth page before it is forwarded for scientific peer review.

Biographical sketches are submitted as separate PDF attachments in the application package. IES strongly encourages applicants to use SciENcv (<https://www.ncbi.nlm.nih.gov/sciencv/>) where you will find an IES biosketch form. IES will accept the SciENcv format for your biographical sketch even though it does not adhere exactly to our general formatting requirements. You may also develop your own biosketch format. If you use SciENcv, the information on current and pending support will be entered into the IES biosketch template. If you use your own format, you will need to provide this information in a separate table.

The biographical sketch for the principal investigator, each co-principal investigator, other key personnel, and consultants (if included) should show how members of the center team possess training and expertise commensurate with their specified duties, for example, by describing relevant publications, grants, and research experience, including experience working with the focal population as applicable.

Provide a list of current and pending grants for the principal investigator, each co-principal investigator, and other key personnel, along with the proportion of their time, expressed as percent **effort over a 12-month calendar year**, allocated to each project. Include the proposed IES grant as one of the pending grants in this list.

Include a persistent identifier (PID) such as an ORCID iD (Open Researcher and Contributor; <https://orcid.org/>) in the biosketches for all key personnel. If you or any key member of your center team does not yet have a PID, IES encourages you to establish one as soon as possible, given the requirement that **all key personnel are required to have a PID in place before an award will be made.**

Part IV: Competition Regulations and Review Criteria

A. Funding Mechanisms and Restrictions

1. Mechanism of Support

IES intends to award cooperative agreements pursuant to this Request for Applications.

2. Funding Available

Although IES intends to support the R&D Center topics described in this announcement, all awards pursuant to this Request for Applications are contingent upon the availability of funds and the receipt of meritorious applications. IES makes its awards to the highest quality applications, as determined through scientific peer review.

The size of the award depends on the center topic and scope of the center's activities. Please attend to the duration and budget maximums set for each center in [Part II: R&D Center Requirements and Recommendations](#).

IES expects the focused program of research to comprise at least 75 percent of the R&D Center's activities depending on the cost and effort required to carry out the focused program of research, with the remainder of the budget devoted to the national leadership activities and any administrative activities not included in the focused program of research. You **must** allocate at least 5 percent of the center's budget to the supplemental activities of the center that will be determined cooperatively with IES after an award is made.

Although the plans of IES include the Education Research and Development Center topics described in this announcement, awards pursuant to this Request for Applications are contingent upon the availability of funds and the scientific merit of applications as determined by scientific peer review. IES will prioritize funding one R&D Center under each topic.

3. Cooperative Agreements

Through the terms of the cooperative agreement, grantees will work with IES to plan work related to Supplemental and National Leadership, Capacity Building, and Outreach activities.

4. Special Considerations for Budget Expenses

a) Indirect Cost Rate

Applicants are expected to apply their institution's federally negotiated indirect cost rate when developing a budget for the proposed research project.

If your institution does not have an indirect cost rate and you receive a grant from IES, the Indirect Cost Group (ICG) in the U.S. Department of Education's Office of the Chief Financial Officer (<https://www2.ed.gov/about/offices/list/ocfo/fipao/faq.html>) can help with obtaining an indirect cost rate once the grant is awarded. Please note that the ICG is not available for assistance during the application preparation process.

Most institutions that do not have a current negotiated rate may use a de minimis rate of 10 percent of modified total direct costs (see 2 CFR §200.414 https://www.ecfr.gov/cgi-bin/text-idx?node=se2.1.200_1414&rgn=div8 for more information). This de minimis rate may be used indefinitely and no documentation is required to justify its use.

Institutions, both primary grantees and subawardees, not located in the territorial United States may not charge indirect costs.

b) Meetings and Conferences

There are statutory and regulatory requirements in determining whether costs related to hosting meetings and conferences are reasonable and necessary. Please refer to the Office of Management and Budget's (OMB's) Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards (Uniform Guidance), 2 CFR, §200.432 Conferences (https://www.ecfr.gov/cgi-bin/text-idx?SID=dcd3efbcf2b6092f84c3b1af32bdcc34&node=se2.1.200_1432&rgn=div8).

Federal grant funds cannot be used to pay for alcoholic beverages or entertainment, which includes costs for amusement, diversion, and social activities. In general, federal funds may not be used to pay for food. A grantee hosting a meeting or conference may not use grant funds to pay for food for conference attendees unless doing so is necessary to accomplish legitimate meeting or conference business. You may request funds to cover expenses for working meetings, such as working lunches; however, IES will determine whether these costs are allowable in keeping with the Uniform Guidance Cost Principles. Grantees are responsible for the proper use of their grant awards and may have to repay funds to the Department if they violate the rules for meeting- and conference-related expenses or other disallowed expenditures.

5. Program Authority

"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.

6. Applicable Regulations

Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards (Uniform Guidance) codified at CFR Part 200. The Education Department General Administrative Regulations (EDGAR) in 34 CFR parts 77, 81, 82, 84, 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.

B. Additional Requirements

1. Pre-Award

a) Clarification and Budget Questions

IES uses the scientific peer review process as the first step in making funding decisions. If your application is recommended for funding based on the outcome of the scientific peer review, an IES program officer will contact you to clarify any issues that were raised by the peer reviewers and to address whether the proposed budget adequately supports the proposed scope of work and meets federal guidelines.

b) Demonstrating Access to Data and Education Settings

The focused program of research you propose to conduct will most likely require that you have (or will obtain) access to education settings such as classrooms, schools, districts, colleges/universities; secondary datasets; or studies currently under way. In such cases, you will need to provide evidence that you have access to these resources prior to receiving funding. Whenever possible, include letters of agreement in [Appendix D](#) from those who have responsibility for or access to the data or settings you wish to incorporate when you submit your application. Even in circumstances where you have included such letters with your

application, **IES will require additional supporting evidence prior to the release of funds.** If you cannot provide such documentation, IES may not award the grant or may withhold funds.

You will need supporting evidence of partnership or access if you are doing any of the following.

(1) Conducting research in or with education settings

If your application is being considered for funding based on scientific merit scores from the scientific peer review panel and your research relies on access to education settings, you will need to provide documentation that you have access to the necessary settings in order to receive the grant. This means that if you do not have permission to conduct the proposed project in the necessary number of settings at the time of application, you will need to provide documentation to IES indicating that you have successfully recruited the necessary number of settings for the proposed research before the full first-year costs will be awarded. If you recruited sufficient numbers of settings prior to the application, IES will ask you to provide documentation that the settings originally recruited for the application are still willing to partner in the research.

(2) Using secondary datasets

If your application is being considered for funding based on scientific merit scores from the scientific peer review panel and your research relies on access to secondary datasets (such as federally collected datasets, state or district administrative data, or data collected by you or other researchers), you will need to provide documentation that you have access to the necessary datasets in order to receive the grant. This means that if you do not have permission to use the proposed datasets at the time of application, you must provide documentation to IES from the entity controlling the dataset(s) before the grant will be awarded. This documentation must indicate that you have permission to use the data for the proposed research for the time period discussed in the application. If you obtained permission to use a proposed dataset prior to submitting your application, IES will ask you to provide updated documentation indicating that you still have permission to use the dataset to conduct the proposed research during the project period.

(3) Building on existing studies

You may propose studies that piggyback onto an ongoing study, which will require access to those subjects and data. In such cases, the principal investigator of the existing study should be one of the members of the research team applying for the grant to conduct the center's focused program of research.

In addition to obtaining evidence of access, IES strongly advises applicants to establish a written agreement, within three months of receipt of an award, among all key collaborators and their institutions (including principal and co-principal investigators) regarding roles, responsibilities, access to data, publication rights, and decision-making procedures.

c) Assessment of Past Performance

IES considers the applicant's performance and use of funds under a previous federal award as part of the criteria for making a funding decision. IES also determines the principal investigator's (PI's) compliance with the IES Policy Regarding Public Access to Research if they were the PI on previous IES grants awarded in 2012 or later (<https://ies.ed.gov/funding/researchaccess.asp>).

d) Persistent Identifiers (PIDs) for Key Personnel

All key personnel are required to have a persistent identifier (PID), such as ORCID iD (Open Researcher and Contributor Identification; <https://orcid.org/>) **in place before an award will be made.**

2. Post-Award

a) Compliance with IES Policy Regarding Public Access to Research

(1) Access to research results: Grantee submissions to ERIC

IES requires all grantees to submit the electronic version of peer-reviewed scholarly publications to ERIC (<https://eric.ed.gov/>), a publicly accessible and searchable electronic database of education research that makes available full-text documents to the public for free. This public access requirement (<https://ies.ed.gov/funding/researchaccess.asp>) applies to peer-reviewed, original scholarly publications that have been supported (in whole or in part) with direct funding from IES. The public access requirement does not apply to book chapters, editorials, reviews, or non-peer-reviewed conference proceedings. **As the designated representative for the grantee institution, IES holds the principal investigator (PI) responsible** for ensuring that authors of publications stemming from the grant comply with this requirement.

The author's final manuscript is defined as the final version accepted for journal publication and includes all modifications from the peer review process. Submission of accepted manuscripts for public accessibility through ERIC is strongly encouraged as soon as possible **but must occur within 12 months of the publisher's official date of publication.** ERIC will not make the accepted manuscripts available to the public prior to the end of the 12-month embargo period, unless specified by the publisher.

The ERIC website includes a homepage for the Grantee and Online Submission System (<https://eric.ed.gov/submit/>), as well as a Frequently Asked Questions page (<https://eric.ed.gov/?granteefaq>). During the submission process, authors are asked to submit bibliographic information from the publication, including title, authors, publication date, journal title, and associated IES award number(s).

(2) Access to final research data

Applicants to this competition must describe a plan for making final research data available should the center be funded. You must include a Data Sharing and Management Plan (DSMP) in [Appendix A](#). The scientific peer review process will not include the DSMP in the scoring of the scientific merit of the application. Instead, IES program officers will be responsible for reviewing the completeness of the proposed DSMP. The costs of the DSMP can be covered by the grant and should be included in the budget and explained in the budget narrative.

b) Pre-Register Studies

Grantees must register their exploratory and impact studies on a suitable pre-registration platform within the first year of receiving a new award. There are several options for pre-registration including but not limited to the Registry of Efficacy and Effectiveness Studies (REES; <https://sreereg.icpsr.umich.edu/sreereg/>), the Open Science Framework (OSF; <https://osf.io/>), ClinicalTrials.gov (<https://clinicaltrials.gov/>), AEA Registry (<https://www.socialscienceregistry.org/>), EGAP (<https://egap.org/content/registration>), Uri Simonsohn's *AsPredicted* (<https://aspredicted.org/>), and trial registries in the WHO Registry Network (<https://www.who.int/ictrp/network/en/>).

c) Special Conditions on Grants

IES may impose special conditions on a grant pertinent to the proper implementation of key aspects of the proposed research design or if the grantee is not financially stable, has a history of unsatisfactory performance, has an unsatisfactory financial or other management system, has not fulfilled the conditions of a prior grant, or is otherwise not responsible.

d) Attendance at the Annual IES Principal Investigators Meeting

The principal investigator (PI) is required to attend one meeting each year (for up to three days) in Washington, DC with other IES grantees and IES staff. The center's budget should include this meeting. PIs who are not able to attend the meeting may designate another person who is key personnel on the research team to attend.

C. Overview of Application and Scientific Peer Review Process

1. Submitting Your Letter of Intent

Letters of intent (LOIs) are submitted online at the IES Peer Review Information Management Online (PRIMO) system (<https://iesreview.ed.gov/LOI/LOISubmit>). **Select the Letter of Intent form for the competition under which you plan to submit your application.** The online submission form contains fields for each of the seven content areas listed below. Use these fields to provide the requested information. The center description should be single-spaced and is recommended to be no more than one page (about 3,500 characters).

The LOI is non-binding and optional but strongly recommended. If you submit an LOI, a program officer will contact you regarding your proposed center. IES staff also use the information in the LOI to identify the expertise needed for the scientific peer review panels and to secure a sufficient number of reviewers to handle the anticipated number of applications.

Elements for the Letter of Intent:

- Descriptive title
- R&D Center Topic that you will address
- Brief description of the proposed center
- Name, institutional affiliation, address, telephone number, and email address of the principal investigator and any co-principal investigators
- Name and institutional affiliation of any key collaborators and contractors
- Duration of the proposed project (attend to the Duration maximums for each center)
- Estimated total budget request (attend to the Budget maximums for each center)

2. Multiple Submissions

You may submit applications to more than one of the FY 2024 IES grant programs. In addition, within a particular grant program or topic, you may submit multiple applications. However, you may submit a given application only once for the FY 2024 grant competitions, meaning you may not submit the same application or similar applications to multiple grant programs, multiple topics, or multiple times within the same topic. If you submit the same or similar applications, IES will determine whether and which applications will be accepted for review and/or will be eligible for funding.

3. Application Processing

Applications must be submitted electronically and received no later than 11:59:59 p.m. Eastern Time on March 7, 2024 using the Grants.gov Workspace (<https://www.grants.gov/applicants/workspace-overview.html>). You must follow the application procedures and submission requirements described in the IES Application Submission Guide (https://ies.ed.gov/funding/submission_guide.asp) and on Grants.gov (<https://www.grants.gov/applicants>).

After applications are fully uploaded and validated at Grants.gov, the U.S. Department of Education receives the applications for processing and transfer to the IES PRIMO system (<https://iesreview.ed.gov/>). PRIMO allows applicants to track the progress of their application via the Applicant Notification System (ANS).

Approximately one to two weeks after the application deadline, invitation emails are sent to applicants who have never applied to IES before to create their individual PRIMO ANS accounts. Both the PI and the AOR will receive invitation emails. Approximately four to six weeks after the application deadline, all applicants (new and existing ANS users) will begin to receive a series of emails about the status of their application. See the IES Application Submission Guide (https://ies.ed.gov/funding/submission_guide.asp) for additional information about ANS and PRIMO.

Once an application has been submitted and the application deadline has passed, you may not submit additional materials or information for inclusion with your application.

4. Scientific Peer Review Process

IES will forward all applications that are compliant and responsive to this Request for Applications to be evaluated for scientific and technical merit. Scientific reviews are conducted in accordance with the review criteria stated below and the review procedures posted on the IES website (https://ies.ed.gov/director/sro/application_review.asp) by a panel of experts who have substantive and methodological expertise appropriate to the program of research and Request for Applications.

Each compliant and responsive application is assigned to one of the IES review panels (<https://ies.ed.gov/director/sro/reviewers.asp>). Applications are assigned to panel according to the match between the overall expertise of reviewers on each panel and the content and methodological approach proposed in each application.

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, IES calculates an average overall score for each application and prepares a preliminary rank order of applications 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 application that they believe merits full panel review but that would not have been included in the full panel meeting based on its preliminary rank order.

5. Review Criteria for Scientific Merit

The purpose of IES-supported research is to help solve education problems by generating reliable information about education programs, practices, policies, and assessments that support learning and improve academic achievement and education access for all learners. IES expects reviewers to assess the scientific rigor and practical significance of the center proposed in order to judge the likelihood that it will

make a meaningful contribution to the larger IES mission. Information about each of these criteria is described in [Part II R&D Center Requirements and Recommendations](#).

a) Significance of the Focused Program of Research

Does the applicant provide a compelling rationale for the significance of the R&D Center as defined in the section on the significance of the focused program of research? Does the applicant thoughtfully address the recommendations described in the significance section for the specific R&D Center topic?

b) Research Plan for the Focused Program of Research

Does the applicant thoughtfully address the recommendations described in the sections detailing the methodological requirements for the focused program of research?

c) National Leadership, Capacity Building, and Outreach Activities

Does the description of the applicant's capacity to conduct supplemental and leadership activities demonstrate that the applicant has the ideas, experience, and capability to successfully carry-out such activities in cooperation with IES? Does the applicant propose meaningful leadership, capacity building, and outreach activities for the R&D Center? Does the applicant thoughtfully address the recommendations described for national leadership, capacity building, and outreach activities?

d) Management and Institutional Resources

Do the plans and procedures for the overall management of the R&D Center indicate that the applicant has the capacity to complete the proposed research, dissemination, and leadership activities efficiently and successfully? 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 proposed R&D Center activities? Does the applicant thoughtfully address the recommendations for management and institutional resources?

e) Personnel

Does the description of the personnel make it apparent that the Principal Investigator/Center Director and other key personnel possess the appropriate training and experience and will commit sufficient time to competently implement the proposed research and leadership activities? Does the applicant thoughtfully address the recommendations described for personnel?

6. Award Decisions

The following will be considered in making award decisions for responsive and compliant applications:

- Scientific merit as determined by scientific peer review
- Performance and use of funds under a previous federal award
- Contribution to the overall program of research described in this request for applications
- Ability to carry out the proposed research within the maximum award and duration requirements
- Availability of funds

Part V: Compliance and Responsiveness Checklist

Only compliant and responsive applications will be forwarded for scientific peer review. Use this checklist to better ensure you have included all required components for compliance and that you have addressed all general and R&D center narrative requirements for responsiveness.

See the IES Application Submission Guide (https://ies.ed.gov/funding/submission_guide.asp) for an application checklist that describes the forms in the application package that must be completed and the PDF files that must be attached to the forms for a successful submission through Grants.gov.

Compliance
Have you included the R&D center narrative?
Do the R&D center narrative and other narrative content adhere to all formatting requirements?
Do the R&D center narrative and other narrative content adhere to all page maximums as described in the RFA? IES will remove any pages above the maximum before forwarding an application for scientific peer review.
Have you included Appendix A: Data Sharing and Management Plan?
General Requirements for Responsiveness
Does the proposed R&D center address the needs of typically developing learners?
Is the proposed research relevant to education in the United States, and does it address factors under the control of U.S. education systems?
Have you indicated a single topic for your application?
Does your R&D center narrative include the five required sections and the associated requirements for the selected R&D Center Topic? Did you describe the elements required for each section as listed below?

This checklist continues on the next page.

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R&D Center Narrative Requirements for Responsiveness				
	<u>Improving Rural Education</u>	<u>K-12 Teacher Recruitment and Retention Policy</u>	<u>Improving Outcomes in Science Education</u>	<u>Using Generative Artificial Intelligence to Augment Teaching and Learning in Classrooms</u>
Sample	PreK, K-12, postsecondary, and/or adult learners	K-12 general education teachers Typically developing learners	Elementary grade learners	PreK, K-12, postsecondary, and/or adult learners
Outcomes	Learner academic achievement If applicable <ul style="list-style-type: none"> • Educator knowledge, skills, beliefs, behaviors, and/or practices • Learner social, emotional, and/or behavioral competencies 	Learner academic achievement Teacher recruitment and/or retention	Learner science achievement	Learner academic achievement If applicable <ul style="list-style-type: none"> • Educator knowledge, skills, beliefs, behaviors, and/or practices • Learner social, emotional, and/or behavioral competencies
Setting	Rural locale (federal or state criteria) At least two states or territories Letter of agreement for each state/territory	At least two states or territories Letter of agreement and data-sharing agreement for each state/territory	Education settings as described under General Requirements	Education settings as described under General Requirements
Significance of the Focused Program of Research	Problem or issue related to rural education Research questions	The policies on which the Center will focus	The assessment you propose to develop/ refine The purpose(s), population(s), and context(s) for which the assessment is intended The existing interventions you propose to test and how they are being, will be, and/or were implemented Any prior evidence of impact on learner education outcomes (or lack of evidence) for the interventions you propose to test	An identified need in education practice Generative AI use cases

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<p>Research Plan for the Focused Program of Research</p>	<p>For each study proposed</p> <ul style="list-style-type: none"> • sample(s) and setting(s) • research design(s), method(s), and data analytic approach(es) 	<p>Plans to assess impact of teacher recruitment and retention policies in at least two states or territories</p> <p>Plans to document implementation of the policies being studied</p> <p>Plans for cost and cost effectiveness analyses of the policies</p>	<p>Plans to carry out landscape analysis of existing elementary science achievement measures</p> <p>Plans for a measurement study to develop and/or refine science achievement assessments, document validity and reliability, and establish connection to existing standardized tests of science achievement</p> <p>Plans to evaluate impact of at least two elementary science interventions</p>	<p>Plans for at least one exploratory study of generative AI use in classrooms</p> <p>Plans for development and pilot testing of at least one educator- and/or learner-facing generative AI tool in classrooms</p>
<p>National Leadership, Capacity Building, and Outreach Activities</p>	<p>Contribution to improved rural education practice and learner academic outcomes</p> <p>Dissemination to stakeholders</p> <p>Build the field's capacity to conduct rural education research</p>	<p>Contribution to improved K-12 teacher recruitment and retention and learner academic outcomes</p> <p>Dissemination to stakeholders</p> <p>Build the field's capacity to conduct K-12 teacher recruitment and retention research</p>	<p>Contribution to improved elementary science education practice and learner science achievement outcomes</p> <p>Dissemination to stakeholders</p> <p>Build the field's capacity to conduct elementary science education measurement and impact research</p>	<p>Contribution to improved use of generative artificial intelligence (AI) to improve education processes and learners' academic outcomes</p> <p>Dissemination to stakeholders</p> <p>Build the field's capacity to conduct research in generative AI as it applies to education processes and learners' education outcomes</p>
<p>Management and Institutional Resources</p>	<p>Organizational structure of the center</p> <p>Plans and procedures for the overall management of the center</p> <p>Resources to support the work of the center</p>	<p>Organizational structure of the center</p> <p>Plans and procedures for the overall management of the center</p> <p>Resources to support the work of the center</p>	<p>Organizational structure of the center</p> <p>Plans and procedures for the overall management of the center</p> <p>Resources to support the work of the center</p>	<p>Organizational structure of the center</p> <p>Plans and procedures for the overall management of the center</p> <p>Resources to support the work of the center</p>
<p>Personnel</p>	<p>Your team</p>	<p>Your team</p>	<p>Your team</p>	<p>Your team</p>

Part VI: Required Codes for Item 4b of the SF 424 Cover Sheet

Applications to the **Education Research and Development Center Program (ALN 84.305C)** are submitted under a single topic.

You **must** enter the appropriate topic code in Item 4b of the SF 424 Application for Federal Assistance form (see the IES Application Submission Guide https://ies.ed.gov/funding/submission_guide.asp for more information about this form).

R&D Center Topic	Codes
Improving Rural Education	Rural Education
K-12 Teacher Recruitment and Retention Policy	K-12 Teacher
Improving Outcomes in Elementary Science Education	Science Education
U sing G enerative A rtificial I ntelligence to Augment Teaching and Learning in Classrooms	U-GAIN