This paper was commissioned for the Committee on the Future of Education Research at the Institute of Education Sciences in the U.S. Department of Education, whose work was supported by the U.S. Department of Education. Opinions and statements included in the paper are solely those of the individual authors, and are not necessarily adopted, endorsed, or verified as accurate by the Committee on the Future of Education Research at the Institute of Education Sciences in the U.S. Department of Education, the Board on Science Education, or the National Academy of Sciences, Engineering, and Medicine.

Summary of IES Funded Topics

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Paper Commissioned by The National Academies of Sciences, Engineering and Medicine's Committee on the Future of Education Research at the Institute of Education Sciences in the U.S. Department of Education

I. Introduction

The paper summarizes they types of research studies funded by NCER and NCSER throughout the twenty-year history of IES. This paper addresses a range of research questions regarding the types of studies that have been funded across different time periods and categories. For example, this includes questions regarding:

- What *topics* have been studied in research funded by NCER and NCSER, and how have the distribution of funded topics shifted over time?
- How have studies of different *project types* funded by NCER and NCSER changed over time? How are studies connected to one another?
- What types of *interventions* are studied? Where are these interventions targeted?
- What is the relative *funding* distribution across topic areas, and what topic areas have received the highest levels of funding?
- What *institutions* receive grants from NCER and NCSER? How has this changed over time?
- What *Methods* and *Measurement* types have been studied under funded grants?

To answer these questions, we turn to publicly available data on IES funded grants, which include information on each of these areas via the inclusion of study abstracts.

II. Methods

A. Data and Inclusion / Exclusion Criteria

The data for this project come from the public information about funded IES awards that is available for download from the IES website (Institute of Education Sciences, 2021). Data to classify institution types (R1, MSI, and Private) come from the Carnegie Classification database which is based on information from IPEDS (Indiana University Center for Postsecondary Research, n.d.).

The complete dataset includes over 2500 grants and contracts funded by NCER, NCSER, NCEE, and NCES from 2002 to 2021. This analysis is limited to grants funded by NCER and NCSER between 2002 and 2020. Although 2021 awards have been announced, it is unclear if all 2021 awards were present in the data from the IES website at the time of download, thus 2021 awards have been excluded. The analytic dataset also excludes awards funded by NCEE and NCES. Contracts have been excluded, leaving only grants. All analyses in this paper exclude Small Business Innovation Research (SBIR) grants. Although NCER and NCSER issue SBIR awards, they differ from other awards in several ways. SBIR awards fall into either Phase I Development or Phase II Development. They are of a short duration and target small businesses with an emphasis on commercialization of the products that are developed. Many of them are also classified as contracts rather than grants. SBIR is a federal program that operates across federal agencies and is not unique to the Department of Education.

B. Project Types

Over the past twenty years, NCER and NCSER have funded grants in a variety of categories based on two dimensions. One dimension is the 'topic' of the grant. Another dimension is the 'project type'. Over time, the project types have changed. For much of the past twenty years, these were divided into numbered goals (1-5). More recently, this numbering was removed and some categories shifted. Because of changes over time in the wording of the RFAs and types of studies that fall under each project type, some simplification in terminology is required to communicate about each.

Historically, the core project structure included 5 goals:

- Goal 1 – Exploration
- Goal 2 – Development and Innovation
- Goal 3 – Efficacy
- Goal 4 – Effectiveness
- Goal 5 – Measurement

The categorizations that IES provides on their website include variations on these five goals. Additionally, IES funds grants in other programs such as Researcher-Practice Partnerships (RPP), Training, Methods, and various special programs including large "center" grants that engage in activities that cover multiple goals. The publicly available data on IES's website about funded grants includes a field called "GoalText," but not the actual Goal (i.e., 1, 2, 3, 4, 5, etc.) each grant was funded under. Instead, the GoalText field contains a description that characterize the purpose of the grant.

While 'Exploration' and 'Development and Innovation' projects have remained approximately the same over the history of IES, Efficacy and Effectiveness studies have changed over time. To explore trends over time, we therefore had to create new categories; this involved combining categories in some cases. One important case is with regards to replication grants, which over time moved from Goal 3 to Goal 4 studies, and then to their own project type.

For purposes of comparison, we divided out "Initial Efficacy" studies into their own project type and then combined "Replication" and "Effectiveness" trials into a single category. This required us to determine which Efficacy studies were 'initial' trials versus 'replications'. To do so, we turned to Chhin, Taylor, and Wei (2018), who categorized all Goal 3 and Goal 4 grants funded

by NCER and NCSER between 2004 and 2016 as either a direct or conceptual replication, new evaluation, re-analysis, or longitudinal follow-up. We use the codes applied by Chhin and colleagues for the grants that they coded to identify replications.

All other grants with GoalText of Efficacy or Efficacy and Replication that were not coded by Chhin and colleagues were coded using the publicly available abstracts. Following the method described in Chhin et al. (2018), we checked IES abstracts for evidence of the stated purpose of the evaluation and prior efficacy evaluations of the program. If a study cited pilot evaluations only, including previous Development and Innovation grants from IES, or provided no information about the purpose of the study regarding replication, it was coded as a non-replication and was classified as Efficacy for these analyses. If there was evidence of previous efficacy studies or if the stated goal of the grant was for replication, it was coded as a replication and classified as Replication/Effectiveness. The publicly available abstracts provide limited information about each grant. Chhin and colleagues had access to full grant proposals and were able to identify many replications (~50% of 307 grants). Using abstracts, we identified 32 out of 189 (17%) additional grants that had GoalText indicating an efficacy trial. It is plausible that coding replications from abstracts undercounts the number of replications based on the disparity between Chhin and colleagues' rate and the rate we coded from abstracts. It is unclear, though, if the rate of replications is consistent across time and programs funded by IES.

Table 1 shows how those GoalText descriptions were categorized for these analyses. The "Other" category includes special grant competitions, unsolicited grants, centers established for the study of particular topics, and other projects that cover multiple goals. All grants with GoalText that covers more than one goal (e.g., Efficacy and Development) were classified as meeting multiple goals and were categorized as Other.

Table 1. Categorization of GoalText into grant categories

Exploration	Exploration
Development & Innovation	Development and Innovation
Efficacy	Efficacy*
	Efficacy and Replication*
	Follow-Up
	Initial Efficacy
Replication/Effectiveness	Effectiveness
	Efficacy*
	Efficacy and Replication*
	Replication Effectiveness
	Replication Efficacy
	Scale-Up Evaluations
Measurement	Measurement
Methods	Methodological Innovation
RPP	Researcher-Practitioner Partnership
Training	Training
Other	Multiple Goals
	No Goal
	Other Goal
	Development and Evaluation
	Efficacy and Development
	Exploration and Efficacy
	Exploration and Measurement

C. Topics

Eight topics were formed using the program names that IES provides as the source of funding for each grant. See Appendix A for a list of program names where all grants were assigned to a particular topic and a list of program names for which topics were coded by coders. In some cases, the program names are descriptive and map well onto a topic, as is the case with the Science, Technology, Engineering, and Mathematics (STEM) program which maps onto the STEM topic used in this analysis. In other cases, the program name is not very descriptive, as in the case of Research Grants Focused on Systematic Replication. In the cases where the program name was not indicative of the type of intervention or idea being studied, the IES abstracts were coded to fit within the topic categories. Because the topics are not mutually exclusive (e.g., a STEM intervention that happens in an Early Childhood classroom could fall into both the STEM and Early Childhood categories), preference was given to School Systems, Age (Early Childhood and Post-Secondary/Adult), then Cognition & Learning, Social & Behavioral, followed by content area (Reading, Writing, Language, Literacy, & ELL; STEM). School Systems was used for interventions that changed the structure of school operations, regardless of content area (e.g., State-wide remedial Algebra program). The Other category captures a small proportion of grants that do not fit well within the seven other topic categories.

D. Institution type

In categorizing institutions that have received IES funds (both NCER and NCSER), universities include hospitals and research centers that are affiliated with a university. Research firms are defined as non-university institutions whose primary work is in the evaluation of products and programs that they did not develop themselves (i.e., external evaluations). This does not mean that they never engage in development of interventions, products, and techniques but that it is not their primary purpose. Developers, on the other hand, engage in basic research and evaluations of primarily on their own products and interventions. Within the Other category there are several types of institutions, although individually they make up only a very small proportion of grants and funding awarded by IES. These types of institutions include education service providers, scientific organizations, state departments of education, and school districts. All institutions were coded into an institution type based on the description of the institution on its own website, if available, or other internet sources.

R1 classification was based on the classification given to the university at the time the grant was awarded. Classifications are recalculated every few years by the Indiana University Center for Postsecondary Research, with new releases in 2000, 2005, 2010, 2015 and 2018. Minority-serving institutions (MSI) status is based on the 2018 data; thus, it does not reflect any changes in MSI status over time.

E. Exploration categories

Exploration studies include a range of possible study types. In order to learn more about these, we divided these studies into different categories. First, we determined if the study involved collecting primary data or if it only included secondary data. If the former, the grant was classified as 'primary', whereas grants that use only secondary data are classified as 'secondary'. Additionally, we divided the grants into categories based on study design. We coded these designs based upon information in the abstracts, resulting in the categories: meta-analysis, correlational analyses, randomized experiments (including pilots), and quasi-experiments (causal questions). There were many Exploration grants that had multiple studies with varying analysis plans. In these cases, if there was any experimental study, the grant was classified as experimental. If there was any meta-analysis, the grant was classified as meta-analysis. If the grant did not use an experiment or conduct a meta-analysis, then if there was a quasi-experiment the grant was classified as such. All other grants were showing associations, correlations, or doing mediation analyses.

F. Methods grants

Publicly available IES abstracts for Methods grants were coded for type of statistical method employed/developed, products produced, and topic of study. We classified studies as psychometric (28), statistical models for analysis (23), randomized control trial design (22), and quasi-experimental design (20). Within those classifications, we also noted some sub-classifications that commonly were funded or which are of interest to the educational methods research community. Relevant sub-types that we coded include: Value-added models, multilevel models, missing data, power analysis, effect size computation/interpretation, regression discontinuity, interrupted time series, single-case design, heterogeneity, external validity, and local treatment effects. If the abstract indicated the grant dealt with any of the sub-types, the sub-type code was applied. We also coded if the grant mentioned development of software.

G. Level of intervention

We also sought to understand the level at which an intervention was targeted. Coding the target of the grants from publicly available abstracts was difficult because ultimately, virtually all IES grants seek to affect student outcomes. In many cases, even if the primary agent through which an intervention worked was someone other than the student, the outcome data used to measure impact was collected from students. Also, it is quite common for studies funded in these categories to have multiple components that target different people. For example, a common occurrence is to have teacher professional development that is accompanied by a curriculum intervention for students.

In cases where an intervention was clearly targeted only or primarily at students, the grant was coded as targeting students. If an intervention had components that affected someone other than students (e.g., professional development for teachers) but those actors were merely delivering an intervention (e.g., a math curriculum) to students, the grant was coded as students as the primary target.

Grants were coded as targeting teachers if they were meant to change teacher practice but did not otherwise affect students except through the changes seen in the teacher. These are primarily tools for teachers or professional development programs that are not intended to train teachers on the use or delivery of a product/intervention to students. The "other" category includes interventions focused on Parents, Administrator and Principals, Schools, and School Systems. As with teachers, interventions were coded as other if they were designed to affect one of the aforementioned actors and did not otherwise affect students, except through the changes induced in the targeted individual or institution. Coding for parents and administrators as the primary target of the intervention worked in much the same way as teachers; the intervention needed to focus on changing beliefs, skills, or behavior or providing tools for the parents or administrators rather than simply having the parents or administrators deliver the intervention.

For schools and school systems, it is not enough for the program to be delivered to all students or staff in a school or for the unit of randomization to have been the school. Grants targeted at schools and school systems change the structure of schools (e.g., implementing a Montessori model) or are policies that affect schools (e.g., a new accountability system for schools in a state). Using this coding scheme results in most interventions funded by both NCER and NCSER across Development & Innovation, Efficacy, and Replication/Effectiveness targeting students.

This same coding scheme was also used to organize Measurement grants. Abstracts were coded for mentions of various actors for which the measures might be targeted. These include students, teachers, or other actors including schools or school systems.

III. Results

A. Project Types and Centers

Figure 1 shows funding over time for NCER and NCSER for grants that were categorized as Exploration, Development & Innovation, Efficacy, Replication/Effectiveness, or Measurement.

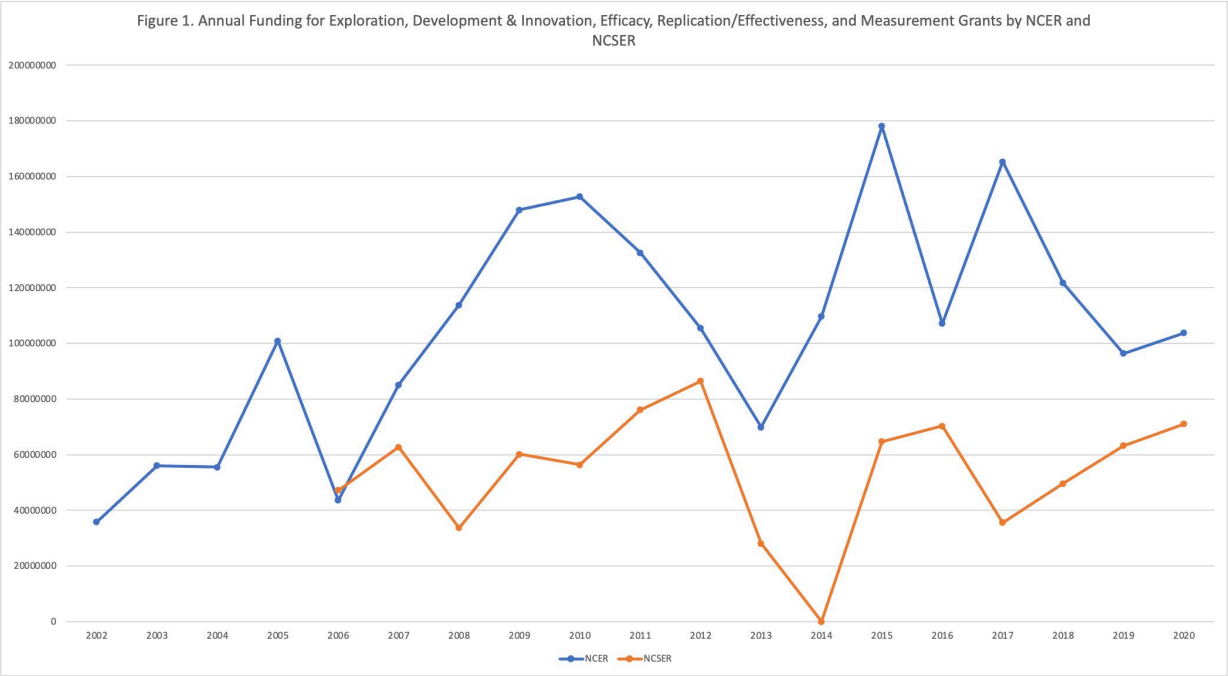

Table 2 shows the allotment of funds that NCER has awarded for each grant category across time. The top row of the table shows the total number of grants awarded in each five-year time period (with the exception of the last time period, 2017-2020, which only covers four years due to the exclusion of 2021 awards) and overall. The second row shows the total funding awarded in millions of dollars. The next three rows indicate the number of grants, funding, and proportion of the total funding that fall into the Exploration, Development & Innovation, Efficacy, and Replication/Effectiveness categories. The columns depict the proportion of funds distributed in each time period to each grant category. Going across a row for each grant category shows how the proportion of funding awarded in each category has changed over time.

Over time, NCER has awarded more funding for Exploration studies and less for Development & Innovation studies as a proportion of funds distributed. Meanwhile, Efficacy studies have increased over time as a proportion of awarded funds.

Table 2. Proportion of funding by grant category and year - NCER

	2002-2006	2007-2011	2012-2016	2017-2020	Overall
Grants	228	443	421	362	1454
Funding (Millions of $)	466.6	952.2	770.9	649.1	2838.9
Project Grants	174	305	256	240	975
Project Funding	269.3	561.1	508.8	458.2	1797.5
% of Total Funding	58%	59%	66%	71%	63%
Exploration	5%	8%	17%	23%	14%
Development & Innovation	35%	37%	24%	18%	28%
Efficacy*	34%	28%	35%	43%	35%
Replication/Effectiveness*	25%	27%	24%	15%	23%

Table 3 is similar to Table 2, except that it shows funding by project type over time for NCSER. Note that while NCER began awarding grants in 2002, NCSER was not established until 2004. Thus, the first time period (2002-2006) contains fewer grants than might be expected compared to other time periods. This early time period also contains a relatively high proportion of Other grants due to a relatively large number of awards funded as No Goal. Looking across the rows, the Efficacy category stands out as receiving an increasingly large proportion of funds over time.

Table 3. Proportion of funding by grant category and year - NCSER

	2002-2006	2007-2011	2012-2016	2017-2020	Overall
Grants	39	175	144	149	507
Funding (Millions of $)	86.3	337.6	286.8	245.4	956.1
Project Grants	23	135	108	105	371
Project Funding	41.2	248.5	224.1	205.7	719.5
% of Total Funding	48%	74%	78%	84%	75%
Exploration	1%	5%	7%	12%	7%
Development & Innovation	37%	49%	32%	31%	38%
Efficacy*	7%	18%	36%	43%	30%
Replication/Effectiveness*	56%	28%	25%	14%	25%

B. Institution Type

Table 4 presents the number of grants, amount of funding, and proportion of funding that has been allocated to different institution types by NCER across grant categories. The top row of Table 4 presents the total number of grants awarded within each category from 2002 to 2020 by NCER. The second row contains the total funding allocated toward each grant category in millions of dollars. The Other category has a disproportionately large amount of funding for the number of grants awarded. This is driven by Center grants that typically fund many projects, usually across multiple goals.

The next rows show the proportion of funds within each goal category that have been awarded to various institution types. Across all goals, universities receive the majority of NCER funds. Only

a small proportion of funds go to MSIs as a share of total funds going to universities. 15% of institutions in the Carnegie database are classified as MSIs which is higher than the proportion of funds distributed to MSIs by NCER. Unsurprisingly, Research 1 (R1) institutions receive a great deal of funding across all goals. These universities have the highest research capacity; R1 status is conferred based in part on research dollars brought in.

Research firms are relatively well represented in Efficacy, Replication/Effectiveness, and Methods grants. This is likely due to research firms having the capacity and experience at running large studies that would be difficult for university researchers, except for a small group with the relevant experience and support, to run. IES has also historically encouraged outside evaluations for effectiveness grants, and since research firms are generally less involved in the development of interventions, they are prime candidates to evaluate an intervention they have not been involved with at earlier stages.

Unsurprisingly, developers are best represented in Development & Innovation grants, although they make up only a small proportion of NCER funding overall. It is worth noting that many institutions that would fall under the developer category receive funding through the SBIR programs, which are excluded from these analyses.

Table 4. Proportion of funding by grant category and institution type - NCER

	Exploration	Development & Innovation	Efficacy	Replication / Effectiveness	Measurement	Methods	RPP	Training	Other	All Grants
Grants	236	369	236	134	121	93	61	114	90	1454
Funding (Millions of $)	251.1	508.9	628.1	409.3	184.0	60.8	24.3	256.5	515.8	2838.9
University	86%	82%	66%	70%	84%	70%	69%	100%	74%	77%
MSI (vs Non-MSI)	13%	7%	3%	5%	9%	5%	2%	3%	11%	7%
R1 (vs Non-R1)	80%	68%	54%	60%	73%	59%	61%	97%	73%	68%
Private (vs Public)	24%	24%	23%	18%	19%	36%	20%	51%	25%	26%
Research Firm	12%	9%	26%	28%	13%	30%	21%	0%	21%	18%
Developer	1%	6%	5%	0%	3%	0%	3%	0%	4%	3%
Other	0%	3%	3%	2%	1%	0%	7%	0%	1%	2%

Table 5 presents NCSER funding by institution type for each grant category. Here, universities make up an even greater share of grants in all categories. This is especially apparent in Efficacy grants where fewer research firms are awarded grants relative to the proportion of Efficacy grants that go to research firms from NCER. Meanwhile, developers do very little work funded by NCSER. This excludes SBIR grants which overwhelmingly go to developers.

Table 5. Proportion of funding by grant category and institution type - NCSER

	Exploration	Development & Innovation	Efficacy	Replication / Effectiveness	Measurement	Training	Other	All Grants
Grants	54	191	70	56	55	48	33	507
Funding (Millions of $)	53.4	271.8	216.0	178.3	85.8	26.2	124.5	956.1
University	90%	94%	92%	80%	81%	100%	93%	90%
MSI (vs Non-MSI)	13%	12%	6%	3%	5%	13%	10%	8%
R1 (vs Non-R1)	76%	71%	76%	65%	65%	81%	76%	72%
Private (vs Public)	17%	12%	14%	20%	13%	12%	22%	16%
Research Firm	9%	2%	3%	19%	17%	0%	7%	8%
Developer	0%	3%	2%	0%	0%	0%	0%	1%
Other	1%	1%	3%	1%	1%	0%	0%	1%

C. Principal Investigators

In addition to what institution types have won grants across grant categories, we also examine the number of principal investigators (PIs) that have won grants across grant categories. Table 6 show the number of PIs that have won awards in multiple categories. The bottom row indicates the number of unique PIs that have won awards in each category. The diagonal represents the number of PIs that have won multiple grants in each category. For example, 91 out of 447 unique PIs have won multiple Development & Innovation grants. Note that the numbers in Table 6 represent PIs and not grants. Among the 90 PIs who have won a Development & Innovation and an Efficacy grant, there are numerous PIs who have won multiple Development & Innovation and/or Efficacy grants.

Table 6. Number of PIs funded under multiple grant categories

	Exploration	Development & Innovation	Efficacy	Replication / Effectiveness	Measurement	Methods	RPP	Training	Other
Exploration	33								
Development & Innovation	47	91							
Efficacy	32	90	26						
Replication/Effectiveness	18	36	53	26					
Measurement	14	30	15	6	26				
Methods	7	0	1	0	0	17			
RPP	6	7	9	5	5	2	1		
Training	22	22	32	19	10	7	6	22	
Other	14	25	24	16	12	6	10	20	13
Unique PIs	245	447	266	149	142	67	60	122	107

D. Connected Grants Across Project Types

Table 7 traces the progression of grants across project types. The data for Table 7 come from grants that were labeled as related to another grant number in the IES public abstracts. The extent to which related grants trace interventions is not fully clear, but there is at least some relationship between the product or intervention in related grants, even if the product or intervention is not the same across grant categories. Subsequent grants may have been awarded to the same PI or a different PI, but the intervention, technique, or idea being tested was related.

Table 7 combines NCER and NCSER grants because there are some cases where grants funded by the two centers are related in the IES data. The rows in Table 7 represent the category of the grant that led to a future, related grant. The columns show the categories of the grants that were preceded by a related grant. The numbers indicate the number of grants from the row category led to a grant in a subsequent year in the column category. For example, a Development & Innovation grant funded in 2005 may have been related to an Efficacy grant in 2010 and then another Development & Innovation grant in 2016. In Table 7, this situation would lead to a future related Efficacy and Development & Innovation grant for the original Development & Innovation grant as well as a future Development & Innovation grant related to the Efficacy grant. Note that this means that some grants are counted more than once in the first four columns of Table 7. Also, note that if a related grant was awarded in the same year or prior to the grant in question, the related grant is not counted in Table 7 as it was not a future grant.

Table 7 only includes Exploration, Development & Innovation, Efficacy, and Replication/Effectiveness grants. There are numerous cases of grants related to other grants that fall outside of these categories. Such relationships are not documented in Table 7.

Out of 560 total Development & Innovation grants awarded between 2002 and 2020, 97 are related to an Efficacy trial funded by IES in a future year. This may understate the proportion of Development & Innovation grants that have led to Efficacy grants as, presumably, Development & Innovation grants that were funded in the last few years have not had the chance to be funded under Efficacy yet. In practice, grants are sometimes funded under "higher" category when the "earlier" studies have not yet been completed.

Table 7. Grants related to future grants by category (2002-2020)

		Related to a future grant in...					
		Exploration	Development & Innovation	Efficacy	Replication / Effectiveness	None in Future	Total Grants
Grants from...	Exploration	**18**	16	5	3	254	290
	Development & Innovation	9	**68**	97	20	411	560
	Efficacy	13	19	**18**	22	253	306
	Replication/Effectiveness	6	16	25	**30**	140	190

Relatively few Development & Innovation are connected to later Replication/Effectiveness grants. In fact, there are only a few cases of grants following the "ideal" path, going from Development & Innovation to Efficacy to Replication/Effectiveness. Several Efficacy grants went on to have Replication/Effectiveness studies conducted without an associated Development & Innovation grant leading to the Efficacy grant. Given the small number of Replication/ Effectiveness grants distributed, this represents a higher proportion of grants that originated in the IES project structure than at Efficacy. IES is a prominent funder of efficacy studies, so it may be the case that interventions that are ready to be tested in a replication or effectiveness study are likely to have previously been funded by IES.

As Table 7 shows, the pathways through the grant structure that some interventions take are more complicated than a linear Development & Innovation to Efficacy to Replication/Effectiveness path. Some Development & Innovation grants lead to multiple Efficacy grants and some Efficacy grants lead to a later Development & Innovation grant. Out of 306 Efficacy grants, for example, 31 unique grants have moved "backwards" in the project structure at some point.

E. Topics

Tables 8 and 9 present the proportion of grants funded under project types and certain topics. Each column of Tables 8 and 9 show the proportion of grants within each type that were funded by NCER and NCSER in each topic. The rows show how topics differ in the proportion of grants that are awarded across the grant categories. For example, there are many more Exploration and Development & Innovation grants funded in Cognition and Learning than in the other categories shown here, likely because exploratory studies seeking to understand relationships and yet-to-be-developed projects are most likely to come before fully developed interventions which are ready for larger-scale testing.

Table 8. Proportion of grants by topic and category - NCER

	Exploration	Development & Innovation	Efficacy	Replication / Effectiveness	Measurement	Total
Early Learning	8%	5%	14%	12%	22%	10%
Postsecondary/Adult	11%	4%	12%	6%	3%	7%
Literacy & ELL	17%	25%	14%	22%	31%	21%
STEM	5%	22%	10%	19%	18%	15%
Cognition & Learning	27%	23%	6%	8%	6%	16%
Social & Behavioral	10%	16%	17%	21%	8%	15%
School Systems	19%	4%	23%	9%	7%	12%
Other	4%	1%	4%	2%	3%	3%
Total	236	369	236	134	121	1096

Table 9. Proportion of grants by topic and category - NCSER

	Exploration	Development & Innovation	Efficacy	Replication / Effectiveness	Measurement	Total
Early Learning	11%	26%	20%	39%	22%	24%
Postsecondary/Adult	22%	6%	9%	7%	7%	9%
Literacy & ELL	7%	13%	14%	13%	18%	13%
STEM	6%	9%	10%	7%	7%	8%
Cognition & Learning	13%	4%	3%	2%	4%	5%
Social & Behavioral	11%	17%	24%	21%	15%	18%
School Systems	19%	18%	4%	4%	25%	15%
Other	11%	7%	16%	7%	2%	8%
Total	54	191	70	56	55	426

Tables 10 and 11 use the same topic categories but show changes in the proportion of funding going to each topic over time. Table 10 shows the topics funded by NCER and Table 11 shows the topics as they were funded by NCSER. These two tables show only grants funded under Exploration, Development & Innovation, Efficacy, Replication/Effectiveness, and Measurement. As with Tables 2 and 3, the rows indicate how the proportion of funding within a topic has changed over time. The columns add to 100% to show the total allocation of funds during each five-year window. The last column shows the allocation of funds across the topic areas from 2002-2020.

Table 10. Proportion of funding by topic and year - NCER

	2002-2006	2007-2011	2012-2016	2017-2020	Overall
Grants	190	348	297	261	1096
Funding (Millions of $)	291.9	632.2	570.3	487.1	1981.4
Early Learning	13%	9%	14%	11%	11%
Postsecondary/Adult	1%	5%	9%	9%	7%
Literacy & ELL	36%	20%	18%	18%	21%
STEM	21%	25%	9%	9%	16%
Cognition & Learning	14%	14%	14%	9%	13%
Social & Behavioral	6%	10%	21%	25%	16%
School Systems	7%	17%	12%	13%	13%
Other	2%	1%	2%	7%	3%

Table 11. Proportion of funding by topic and year - NCSER

	2002-2006	2007-2011	2012-2016	2017-2020	Overall
Grants	27	161	125	113	426
Funding (Millions of $)	47.2	289.1	249.6	219.5	805.4
Early Learning	33%	25%	27%	24%	26%
Postsecondary/Adult	6%	7%	8%	6%	7%
Literacy & ELL	18%	12%	10%	20%	14%
STEM	1%	8%	12%	8%	9%
Cognition & Learning	0%	3%	6%	4%	4%
Social & Behavioral	31%	20%	19%	18%	20%
School Systems	12%	17%	10%	11%	13%
Other	0%	7%	9%	9%	8%

Tables 12 and 13 trace the topic areas of funded grants that were connected to future, related grants for NCER and NCSER. The first, third, and fifth columns of each table are identical to the corresponding grant category columns in Table 8 and 9. They show the breakdown of grants funded under each topic for the grant categories of interest in Tables 12 and 13. The second column of each table shows the proportion of grants that went from Development & Innovation to a future related Efficacy in each topic area. Because there is no guarantee that a grant that is funded in one topic is also funded in the same topic in future related grants (as programs change over time and interventions may change between grants and be better suited for other programs), the topic areas indicated in column two (Development & Innovation to Efficacy) is the topic area of the original Development & Innovation grant. Likewise, the fourth column (Efficacy to Replication/Effectiveness) uses the topic areas of the Efficacy grant that led to the future Replication/Effectiveness grant, which do not necessarily correspond to the topics of the eventual Replication/Effectiveness grants. Note that occasionally grants are related to future grants that change from NCER to NCSER funding, or vice versa. Tables 12 and 13 use the funding center that funded the earlier grant.

By looking across the columns on Table 12, one can see how the proportion of grants funded in each topic at Development & Innovation compares to the proportion of each topic funded in the grants that "survived" to a future, related Efficacy grant. Likewise, by comparing the second and third column, one can see how the grants that came from an earlier Development & Innovation grant compare to the overall breakdown across topic for all funded Efficacy grants. In the case of NCER, Literacy & ELL, STEM, and Cognition & Learning make up a large proportion of the Efficacy grants that were related to earlier Development & Innovation grants compared to the overall breakdown of all Efficacy grants across topics. One reason may be that some types of Efficacy grants, for example an efficacy study of a community college remediation program (which would be classified under the Postsecondary/Adult topic) is less likely to have been developed in a Development & Innovation grant than a curricular intervention that would be classified under one of the three proportionally well-represented topics in the Development & Innovation to Efficacy grant column. Put more simply, the types of interventions that might first appear at Efficacy may be somewhat different than the types of interventions that flow through the grant project structure.

Table 12. Proportion of related grants by topic area - NCER

	Development & Innovation	D&I to Efficacy	Efficacy	Efficacy to R/E	Replication / Effectiveness
Early Learning	5%	6%	14%	6%	12%
Postsecondary/Adult	4%	0%	12%	12%	6%
Literacy & ELL	25%	26%	14%	6%	22%
STEM	22%	26%	10%	12%	19%
Cognition & Learning	23%	26%	6%	6%	8%
Social & Behavioral	16%	15%	17%	47%	21%
School Systems	4%	0%	23%	12%	9%
Other	1%	0%	4%	0%	2%
Total	369	53	236	17	134

Note. D & I is Development and Innovation; R / E is Replication/Effectiveness

Table 13. Proportion of related grants by topic area - NCSER

	Development & Innovation	D&I to Efficacy	Efficacy	Efficacy to R/E	Replication / Effectiveness
Early Learning	26%	14%	20%	20%	39%
Postsecondary/Adult	6%	9%	9%	0%	7%
Literacy & ELL	13%	20%	14%	0%	13%
STEM	9%	11%	10%	20%	7%
Cognition & Learning	4%	2%	3%	0%	2%
Social & Behavioral	17%	20%	24%	40%	21%
School Systems	18%	11%	4%	0%	4%
Other	7%	11%	16%	20%	7%
Total	191	44	70	5	56

Note. D & I is Development and Innovation; R / E is Replication/Effectiveness

F. Exploration Types

Besides the topics used in the previous Tables 8-13, other grant categories have classifications that may be of interest. Table 14 divides Exploration grants into four categories based upon the types of studies conducted. Notice that 65% of Exploration studies involve at least some primary data collection. Also notice that Exploration grants include a range of study designs and questions. For example, included here are 16 meta-analyses.

Table 14. Current Exploration study types

	Primary Data	ondary Data	Total
(Any) Meta-Analysis	0	16	16
(Only) Correlational	118	58	176
(Only) Quasi-experiement	10	22	32
(Any) Experiement	60	6	66
Total	188	102	290

Note. When grants included multiple data sources and/or studies, primary data collection supercedes secondary data collection. Likewise, meta-analysis supercedes experiements which supercede quasi-experiments.

G. Training Grants

Training grants targeted several different populations based on data coded from publicly available abstracts. The majority of training grants went to pre- and post-doctoral training. 53 of 162 (33%) were for pre-doctoral training and 66 of 162 (41%) were for post-doctoral training. An additional 14 (9%) were for methods training for education researchers and 3 (2%) were for training education practitioners. The remaining 26 (16%) were for a program that funds the early career development and mentoring of individual PIs. In many cases, training grants went to the same institutions multiple times. 31 institutions have won multiple training grants out of only 59 institutions that won all 162 training grants.

H. Methods Grants

Methods grants were divided into four types: psychometrics, statistical models, randomized trials, and quasi-experiments. Within psychometrics, 8 of 28 grants dealt with value-added models. Within statistical models for analysis, 13 of 23 studies dealt with multilevel models or missing data. Within randomized trials, 7 of 22 studies dealt with power analyses and 5 studies looked at effect size computation and interpretation. Several common quasi-experimental designs were regression discontinuity (6), comparative interrupted time series (5), and single-case designs (6).

Across the Methods studies funded since 2002 (excluding 2021), regardless of the statistical methods being developed, 48 abstracts indicated that the grantees were developing software tools for use by other researchers. Also, across the classifications mentioned above, 14 studies dealt with heterogeneity and external validity while 1 focused on prediction of local treatment effects.

I. Targets of Interventions

Tables 15 and 16 show the proportion of grants in Development & Innovation, Efficacy, and Replication/Effectiveness that targeted students, teachers, and others. These analyses indicate that the vast majority of studies focus on interventions focused on students.

Table 15. Proportion of grants by target - NCER

	Development & Innovation	Efficacy, Replication, or Effectiveness	Total
Students	78%	61%	69%
Teachers	19%	18%	19%
Other	3%	20%	12%
Total	369	370	739

Table 16. Proportion of grants by target - NCSER

	Development & Innovation	Efficacy, Replication, or Effectiveness	Total
Students	66%	79%	71%
Teachers	28%	12%	21%
Other	6%	10%	8%
Total	191	126	317

Tables 17 and 18 show how the funding from NCER and NCSER have been allocated to interventions that target students, teachers, and others over time. Each column sums to 100% of the funds that were disbursed for Development & Innovation, Efficacy, and Replication/Effectiveness during each time period. The last column shows the percentage of funds awarded to grants that targeted each group across all time periods. Note that the 2017-2020 column is only a four-year period as grants from 2021 were not included in this analysis.

Table 17. Proportion of funding by target and year - NCER

	2002-2006	2007-2011	2012-2016	2017-2020	Overall
Grants	150	254	186	149	739
Funding (Millions of $)	255.7	513.7	423.1	353.9	1546.4
Students	62%	68%	68%	64%	66%
Teachers	30%	19%	18%	17%	20%
Other	8%	13%	14%	19%	14%

Table 18. Proportion of funding by target and year - NCSER

	2002-2006	2007-2011	2012-2016	2017-2020	Overall
Grants	22	120	92	83	317
Funding (Millions of $)	40.9	236.2	208.1	180.9	666.1
Students	88%	78%	82%	53%	73%
Teachers	12%	12%	11%	37%	19%
Other	0%	10%	7%	10%	8%

Tables 19 and 20 are similar to Tables 12 and 13, except rather than showing the progression of grant by topic area, they show the progression of grants across Development & Innovation, Efficacy, and Replication/Effectiveness by target population of the interventions being studied. The first, third, and fifth columns show the percentage of grants awarded overall in each goal by target group and are identical to the columns for the associated grant categories in Tables 15 and 16 although in Tables 19 an 20 Efficacy and Replication/Effectiveness grants are separated. The second and fourth columns show the percentage of grants by target when Development & Innovation grants were related to a later Efficacy grant and when an Efficacy grant was related to a future Replication/Effectiveness grant.

Table 19. Proportion of related grants by target - NCER

	All Development & Innovation	D&I to Efficacy	All Efficacy	Efficacy to R/E	All Replication / Effectiveness
Students	78%	79%	60%	59%	64%
Teachers	19%	17%	14%	18%	25%
Other	3%	4%	25%	24%	10%
Total	369	53	236	17	134

Note. D & I is Development and Innovation; R / E is Replication/Effectiveness

Table 20. Proportion of related grants by target - NCSER

	All Development & Innovation	D&I to Efficacy	All Efficacy	Efficacy to R/E	All Replication / Effectiveness
Students	66%	82%	71%	80%	88%
Teachers	28%	14%	19%	20%	4%
Other	6%	5%	10%	0%	9%
Total	191	44	70	5	56

Note. D & I is Development and Innovation; R / E is Replication/Effectiveness

J. Measurement Grants

Table 21 shows the proportion of Measurement grants funded by NCER and NCSER that target students, teachers, and others. Across both NCER and NCSER, most of the Measurement grants were targeted toward students (145 out of 176); a much smaller proportion focused on measures

of teachers (24 out of 176). Within the Other category, four grants dealt with schools and school leaders while three grants dealt with larger school systems.

Table 21. Proportion of Measurement grants by target - NCER and NCSER

	NCER	NCSER
Student	77%	95%
Teachers	18%	4%
Other	5%	2%
Total Grants	121	55

Tables 22 and 23 show how target categories map on to the IES programs that funded measurement grants for NCER and NCSER. The majority of Teacher targeted grants were funded under the Effective Instruction Program for NCER and both Teacher targeted grants were funded under Educators and School-Based Service Providers for NCSER.

Table 22. Proportion of Measurement grants by program and target - NCER

Program	Target			
	Students	Teachers	Other	Total
Cognition and Student Learning	6	1	0	7
Early Learning Programs and Policies	24	2	0	26
Education Leadership	0	1	2	3
Education Technology	3	1	0	4
Effective Instruction	0	14	0	14
English Learners	9	0	0	9
Improving Education Systems	0	0	3	3
Literacy	23	0	0	23
Postsecondary and Adult Education	4	0	0	4
Science, Technology, Engineering, & Math (STEM) Education	16	1	0	17
Social and Behavioral Context for Academic Learning	8	1	1	10
Supporting Early Learning from Preschool through Early Elementary School Grades Network	0	1	0	1
Total	93	22	6	121

Table 23. Proportion of Measurement grants by program and target - NCSER

Program	Target			
	Students	Teachers	Other	Total
Autism Spectrum Disorders	1	0	0	1
Cognition and Student Learning in Special Education	2	0	0	2
Early Intervention and Early Learning	12	0	0	12
Educators and School-Based Service Providers	1	2	0	3
Reading, Writing, and Language	10	0	0	10
Research Networks focused on Critical Problems of Policy and Practice in Special Education: Multi-Tiered Systems of Support	0	0	1	1
Science, Technology, Engineering, and Mathematics	4	0	0	4
Social, Emotional, and Behavioral Competence	8	0	0	8
Systems, Policy, and Finance	10	0	0	10
Transition to Postsecondary Education, Career, and/or Independent Living	4	0	0	4
Total	52	2	1	55

IV. Limitations

The data that forms the basis of this analysis was available for download from the IES website. However, the data that IES makes publicly available is limiting in that there are categorizations and details about grants that may or may not be present in the public abstracts. The public abstracts tend to follow a format provided by IES, but it is still sometimes difficult to discern what a grant is about and what sorts of activities the researchers are engaged in. The fields that IES does provide are useful for categorizing by program, but there are many more fields that

would clarify the types of grants IES has funded. More concrete categorizations would be useful instead of relying on PIs to include information in project abstracts.

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Appendix. Topic Coding

Table A1. Programs that correspond to a coded topic

Topic	ProgramName
Early Childhood	• EARLY LEARNING PROGRAMS AND POLICIES • PRESCHOOL CURRICULUM EVALUATION RESEARCH • SUPPORTING EARLY LEARNING FROM PRESCHOOL THROUGH EARLY ELEMENTARY SCHOOL GRADES NETWORK • EARLY INTERVENTION AND EARLY LEARNING
Post-Secondary/Adult	• POSTSECONDARY AND ADULT EDUCATION • TRANSITION TO POSTSECONDARY EDUCATION, CAREER, AND/OR INDEPENDENT LIVING
Reading, Writing, Language, Literacy, & ELL	• ENGLISH LEARNERS • LITERACY • FOREIGN LANGUAGE EDUCATION • READING, WRITING, AND LANGUAGE
STEM	• SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS (STEM) EDUCATION • SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS
Cognition & Learning	• COGNITION AND STUDENT LEARNING • COGNITION AND STUDENT LEARNING IN SPECIAL EDUCATION
Social & Behavioral	• SOCIAL AND BEHAVIORAL CONTEXT FOR ACADEMIC LEARNING • SOCIAL AND CHARACTER DEVELOPMENT

	• SOCIAL, EMOTIONAL, AND BEHAVIORAL COMPETENCE
School Systems	• EDUCATION LEADERSHIP • EVALUATION OF STATE AND LOCAL EDUCATION PROGRAMS AND POLICIES • IMPROVING EDUCATION SYSTEMS • EDUCATORS AND SCHOOL-BASED SERVICE PROVIDERS • SYSTEMS, POLICY, AND FINANCE
Other	• ARTS IN EDUCATION • CAREER AND TECHNICAL EDUCATION • CIVICS EDUCATION AND SOCIAL STUDIES • SYSTEMIC APPROACHES TO EDUCATING HIGHLY MOBILE STUDENTS • UNSOLICITED AND OTHER AWARDS • AUTISM SPECTRUM DISORDERS • FAMILIES OF CHILDREN WITH DISABILITIES • SPECIAL TOPIC: CAREER AND TECHNICAL EDUCATION FOR STUDENTS WITH DISABILITIES

Table A2. Programs for which a topic was coded

	ProgramName
Topic was coded	• EDUCATION TECHNOLOGY • EFFECTIVE INSTRUCTION • FIELD INITIATED EVALUATIONS OF EDUCATION INNOVATIONS • LOW-COST, SHORT-DURATION EVALUATION OF SPECIAL EDUCATION INTERVENTIONS • RESEARCH GRANTS FOCUSED ON SYSTEMATIC REPLICATION • RESEARCH GRANTS FOCUSED ON SYSTEMATIC REPLICATION IN SPECIAL EDUCATION • RESEARCH NETWORKS FOCUSED ON CRITICAL PROBLEMS OF POLICY AND PRACTICE IN SPECIAL EDUCATION: MULTI-TIERED SYSTEMS OF SUPPORT • SPECIAL TOPIC: SYSTEMS-INVOLVED STUDENTS WITH DISIBILITIES • TECHNOLOGY FOR SPECIAL EDUCATION