IES Institute of Education Sciences

Appendices

Federal Efforts Towards Investing in Innovation in Education Through the i3 Fund: A Summary of Grantmaking and Evidence-Building

NCEE 2024-002a
U.S. DEPARTMENT OF EDUCATION

A Publication of the National Center for Education Evaluation at IES

The Institute of Education Sciences (IES) is the independent, nonpartisan statistics, research, and evaluation arm of the U.S. Department of Education. The IES mission is to provide scientific evidence on which to ground education practice and policy and to share this information in formats that are useful and accessible to educators, parents, policymakers, researchers, and the public.

We strive to make our products available in a variety of formats and in language that is appropriate for a variety of audiences. You, as our customer, are the best judge of our success in communicating information effectively. If you have any comments or suggestions about this or any other IES product or report, we would like to hear from you. Please direct your comments to ncee.feedback@ed.gov.

This report was prepared for the Institute of Education Sciences (IES) under Contract ED-IES-15-C-0002 to Abt Associates. The content of the publication does not necessarily reflect the views or policies of IES or the U.S. Department of Education nor does mention of trade names, commercial products, or organizations imply endorsement by the U.S. Government.

February 2024

Goodson, B.D., McCormick, R., Harvill, E., Epstein, C., Sarna, M., and Brown, K. (2024). *Federal Efforts Towards Investing in Innovation in Education Through the i3 Fund: A Summary of Grantmaking and Evidence-Building*. U.S. Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance. http://ies.ed.gov/ncee.

This report is available on the Institute of Education Sciences website at http://ies.ed.gov/ncee.

Federal Efforts Towards Investing in Innovation in Education Through the i3 Fund: A Summary of Grantmaking and Evidence-Building

Appendices

February 2024

Barbara D. Goodson
Eleanor Harvill
Carter Epstein
Maureen Sarna
Kyla Brown
Abt Associates

Rachel McCormick
MC2 Education LLC

NCEE 2024-002a
U.S. DEPARTMENT OF EDUCATION

CONTENTS

LIST OF EXHIBITS

INTRODUCTION

The set of appendices in this volume is a companion to the report *Federal Efforts Towards Investing in Innovation in Education Through the i3 Fund: A Summary of Grantmaking and Evidence-Building*. The volume includes three appendices. Appendix A provides additional details about the Investing in Innovation (i3) Fund. Appendix B provides additional details on how the study was designed and conducted. Appendix C provides statistics that support key findings in the report and exploratory analyses performed to further investigate and understand those key findings. The content of these appendices is referenced throughout the report.

APPENDIX A. ADDITIONAL DETAILS ABOUT THE INVESTING IN INNOVATION (i3) FUND PROGRAM

This appendix provides additional information about the i3 Fund's purpose, structure, and requirements (Section A.1), as well as the technical assistance offered to support grantees' independent evaluations (Section A.2).

A.1 i3 Fund Purpose and Structure

The i3 Fund was established in 2010 as part of the American Recovery and Reinvestment Act to identify, document, and bring to scale innovative practices that improve student outcomes.[1] The targeted outcomes included improved academic achievement or gains in learning, decreased dropout rates, increased high school graduation rates, or increased college enrollment and completion rates. The i3 Fund was intended to address two related challenges to improving student achievement. First, there was a limited number of education strategies supported by rigorous evidence, particularly for some education domains. Second, there were limited incentives to expand effective practices to more students across schools, districts, and states.

The i3 Fund addressed these two challenges using a multi-tier structure intended to incentivize implementation and testing of education strategies at increasingly greater levels of scale. The i3 Fund awarded three types of competitive grants to local education agencies and nonprofit organizations, with the amount of funding provided aligned to the expected scale of implementation and the strength of prior evidence required to support the proposed strategy (Exhibit A.1). This tiered structure allowed the Department both to disseminate more broadly those strategies with strong evidence of effectiveness and to invest in promising but less-rigorously tested strategies that merited additional study.

Because of the differences in the expected scale of implementation for strategies proposed under each grant type, the maximum award amount for an individual award was largest for Scale-up grants, followed by a smaller maximum amount for Validation grants, and the smallest maximum amount per award for Development grants (Exhibit A.1). These maximum award amounts declined over the seven years of the program. In the initial cohort of grants in 2010, Development grants received awards of up to $5 million, Validation grants up to $30 million, and Scale-up grants up to $50 million. In the second and third cohorts of grants, the maximum award amounts were reduced by approximately half for each of the grant types. In the final four cohorts, the awards for Validation and Scale-up grants (but not Development grants) were reduced by another 20 percent.

Exhibit A.1: i3 Grant Award Amounts by Cohort for Three i3 Grant Types

Cohort	Maximum Award Amount		
	Development Grants	Validation Grants	Scale-up Grants
2010	$5 million	$30 million	$50 million
2011	$3 million	$15 million	$25 million
2012	$3 million	$15 million	$25 million
2013	$3 million	$12 million	$20 million
2014	$3 million	$12 million	$20 million
2015	$3 million	$12 million	$20 million
2016	$3 million	$12 million	$20 million

A.1.1 i3 Fund Requirements and Expectations of Grants

To ensure that i3 grants would address pressing educational challenges, have the best potential to improve student outcomes, and provide trustworthy evidence needed to distinguish effective from ineffective strategies, the Department specified *requirements* that grant applicants and recipients were obliged to meet and *expectations* that grant recipients were strongly encouraged to meet.

A.1.1.(a) Eligibility for i3 Grants

To be eligible for an i3 grant award, applicants for all three types of grants had to meet three requirements (Exhibit A.2). First, they had to propose a strategy that targeted "high-need" students, defined as students "at risk of educational failure or otherwise in need of educational support." "High-need" students included, but were not limited to, students who were living in poverty, experiencing homelessness, attending high-minority schools, performing far below grade level expectations, at risk of not graduating high school on time, English learners, and students with disabilities.

Exhibit A.2: Pre-Award i3 Fund Requirements for Three i3 Grant Types

	Development Grants	Validation Grants	Scale-up Grants
Target students	High-need students in grades K through 12[2]		
Topic area	Address at least one of the Department's annual absolute priorities		
Minimum level of prior evidence	Strong theory[3]	Moderate evidence of effectiveness	Strong evidence of effectiveness

Second, applicants had to propose a strategy that addressed at least one of the priority areas (called absolute priorities) that the Department established for each annual grant competition. The Department selected the absolute priorities to build a portfolio of proven education strategies across areas of need (Exhibit A.3).

Exhibit A.3: Absolute Priorities Established by the Department for Three i3 Grant Types

Absolute Priority	Grant Cohort						
	2010	2011	2012	2013	2014	2015	2016
Improving the effectiveness of teachers or principals	●	●	●	●	●	●	
Turning around persistently low-performing schools	●	●	●	●	●		●
Internationally benchmarked college and career-ready standards and assessment	●	●	●		●	●	●
Serving rural communities		●	●	●	●	●	●
Improving STEM education		●	●	●	●	●	●
Effective use of technology				●	●	●	
Use of data	●						
Improving parent/family engagement			●	●			
Improving academic outcomes for English learners				●	●		
Improving academic outcomes for students with disabilities				●	●		
Influencing the development of non-cognitive factors						●	●
Implementing comprehensive high school reform and redesign						●	
Improving school climate, behavioral supports, and correctional education							●
Promoting diversity							●

Third, each applicant also had to document prior evidence of the actual or potential effectiveness of their proposed strategies, where the minimum strength of the required prior evidence varied by grant type. Exhibit A.4 provides details of the prior evidence required for each grant type.

Exhibit A.4: Prior Evidence Eligibility Criteria for Three Types of i3 Grants

Development Grants				
Minimum level of evidence for evaluation design	**Strong theory[4] means a rationale for the proposed strategy that includes a logic model**			
Validation and Scale-up Grants				
Minimum level of evidence for evaluation design	**Moderate evidence of effectiveness (Validation grants) means one of the following conditions is met**		**Strong evidence of effectiveness (Scale-up grants) means one of the following conditions is met**	
Number of Studies	At least 1	At least 1	At least 1	At least 2
Study Design	**Experimental design (randomized controlled trial) that meets WWC[5] standards without reservations**	**Experimental design (randomized controlled trial) or quasi-experimental design that meets WWC standards with reservations**	**Experimental design (randomized controlled trial) that meets WWC evidence standards without reservations**	**Experimental design (randomized controlled trial) or quasi-experimental design that meets WWC standards with reservations**
Study Findings	Statistically significant favorable effect (no unfavorable effects)			
Study Sample	**NA**	**More than one site and at least 350 individuals**	**More than one site (for example, multiple districts or schools) and at least 350 individuals or 50 clusters that have at least 10 individuals**	
Similarity of Study Sample to Proposed Populations and Settings	Study sample overlaps with the characteristics of the populations or settings of the entity proposing to implement the strategy		Study sample overlaps with the characteristics of the populations and settings of the entity proposing to implement the strategy.	

A.1.1.(b) Requirements and Expectations for Successful i3 Grants

The Department also specified post-award requirements intended to support grant recipients in making meaningful contributions to the evidence base for effective educational strategies.

Some requirements applied to all three grant types and others differed for Development grants (Exhibit A.5). All i3 grantees were required to conduct an independent evaluation of the effectiveness of the i3-supported strategy.[6] To ensure that evaluation findings were objective and free from any real or perceived conflict of interest, all grants were required to hire an evaluator independent from the organization that developed and implemented the proposed strategy, who had responsibility for all key activities related to assessing effectiveness. Grants and their evaluators were further required to participate in evaluation technical assistance activities conducted by the Department's contracted evaluation TA provider and to comply with requested information needed to support the national evaluation of the i3 Fund. The Department also required grants to make their evaluation findings "broadly available" through formal (e.g., peer-reviewed journals) or informal (e.g., newsletters) mechanisms. For the first three cohorts of grantees, the findings could be made available in print or electronically; for the final four cohorts of grantees, the requirement changed to digital form only.

In addition to setting grant requirements, the Department also articulated three expectations about the kind of evaluations that grants were expected to design and conduct (Exhibit A.5). One expectation was that grantees were expected to evaluate their proposed strategies at a scale consistent with the level of funding provided. A second expectation related to the strength of the evaluation design used.

Exhibit A.5: Post-Award i3 Fund Evaluation Expectations for Three i3 Grant Types

Expectation	Development Grants	Validation Grants	Scale-up Grants
Scale of implementation	Local level: at least one district or another local educational unit	State or regional level	National level: Multiple states or regions
Minimum level of evidence for evaluation design	Evidence of promise	Meets *What Works Clearinghouse* (WWC) evidence standards with or without reservations	
High-quality implementation data	• Specify key components and outcomes of the strategy and measurable threshold for acceptable implementation for each key component • Measure implementation of each key component against threshold		• Specify key components and outcomes of the strategy and measurable threshold for acceptable implementation for each key component • Specify scale-up goal and mechanism and threshold for acceptable implementation • Measure implementation of each key component and scale-up mechanism against threshold

The minimum strength of evidence expected varied by grant type. Validation and Scale-up grants were expected to design evaluations with the potential to meet the What Works Clearinghouse's (WWC) highest level of strength of evidence (Exhibit A.5). This expectation ensured that grants helped expand the information available to policymakers and practitioners about what strategies work to improve educational outcomes.

Third, grants were expected to collect information about the implementation of their proposed strategy. Policymakers and practitioners looking for solutions to educational challenges also need information about the conditions under which a strategy proved effective or ineffective. This information facilitates decisions about adopting a strategy and also enables researchers to pursue further development, replication, or testing of a strategy in new settings. Data on the number of students, teachers, or schools that actually participated in activities offered and the frequency and duration of services provided as part of a successful educational strategy can help others consider the potential commitment of personnel and time needed to attempt to replicate the strategy in other settings.

Key components: The resources and services provided, activities conducted, and support offered to schools and students receiving the educational strategy.

Grants were expected to identify the key components of their strategy and measure how faithfully the *actual* implementation of the key components reflected their *planned* implementation; this measure of adherence to plan is referred to as "fidelity of implementation." Information on fidelity of implementation serves as important context for interpreting effectiveness findings. If a poorly implemented educational strategy has no effect on student outcomes, it is plausible that the strategy might prove effective if it were better implemented in the future, with more frequent delivery of services or greater levels of participation. On the other hand, low levels of participation may suggest that the strategy is particularly time-consuming or difficult to implement well. If a well-implemented strategy had no effect on student outcomes, the combined information provides greater confidence that the strategy is not an effective one.

A.2 Evaluation Technical Assistance

The i3 Fund contracted with an outside research organization to provide evaluation technical assistance (TA) to grants for their entire grant period. The goal of the evaluation TA was to ensure that the evaluations had the potential to meet i3 Fund expectations for high-quality evidence of effectiveness and implementation. To meet this goal, the evaluation TA team provided consultation to the evaluators on designing and conducting an evaluation of the i3-funded strategies that would meet the expectations of the program.

A.2.1 Key Features of i3 Evaluation Technical Assistance

Six features characterized the evaluation TA provided to i3 grant evaluators (Exhibit A.6).

Consistent and rigorous. The evaluation TA needed to be consistent across grants that varied with respect to the types of students and outcomes targeted, the scale and scope of their proposed strategies, and the expected strength of evidence their evaluations were expected to provide. To ensure this consistency, the TA team adopted or developed, in consultation with the Department, a consistent set of standards to assess the quality of the evaluations the i3 grantees planned, including both their effectiveness and implementation study designs.

Exhibit A.6: Features of i3 Evaluation TA

Another guiding principle for the evaluation TA was that its standards be rigorous. To add to the evidence, based on effective strategies, the Department expected the grantee evaluations to meet quality standards that varied by grant type (see section A.1.1(b)). To ensure both rigor and consistency, the TA team translated these expectations into standard criteria to assess the potential strength of evidence of evaluators' study designs. The TA team, in consultation with the Department, used the WWC evidence standards as guidance. The TA team also developed rigorous standards to assess the quality of implementation data that grants were expected to collect. In coordination with the Department, the TA team developed a set of criteria necessary for a high-quality implementation study (see Section B.4.2 for more detail).

The team provided additional consistency and rigor in the form of standardized tools and templates to help evaluators track the progress of their evaluations, including key design decisions and milestones, and report their findings. The TA team asked each evaluator to submit a draft and final study design plan using a standardized template that outlined what should be included in a comprehensive design plan. To help evaluators anticipate how different design decisions could affect the potential strength of evidence the study would yield, the TA team conducted a systematic review of these study design plans and provided written feedback on the draft and final plans using a standardized memo template. In these feedback memos, the TA team identified potential problems or results of design decisions for the evaluator to consider and made recommendations for mitigating challenges. To ensure consistency in the feedback memos, the TA team drew from a standardized set of pre-written recommendations for common design challenges, adapting the language only when necessary for clarity.

Customized and flexible. Although the evaluation TA emphasized consistency and rigor, the support was also customized to the unique context of each individual grant and flexible enough to accommodate the specific evaluation needs that arose during the design of the evaluation and its conduct in the field. The evaluation TA team assigned each grant's independent evaluator a designated TA provider, who served as the primary point of contact with the evaluator throughout the grant period, from design through analysis and reporting of results. Each TA provider was a WWC-certified reviewer with experience conducting rigorous evaluations in schools. Evaluators worked with their TA provider through one-on-one calls held approximately monthly throughout the five-year grant period.

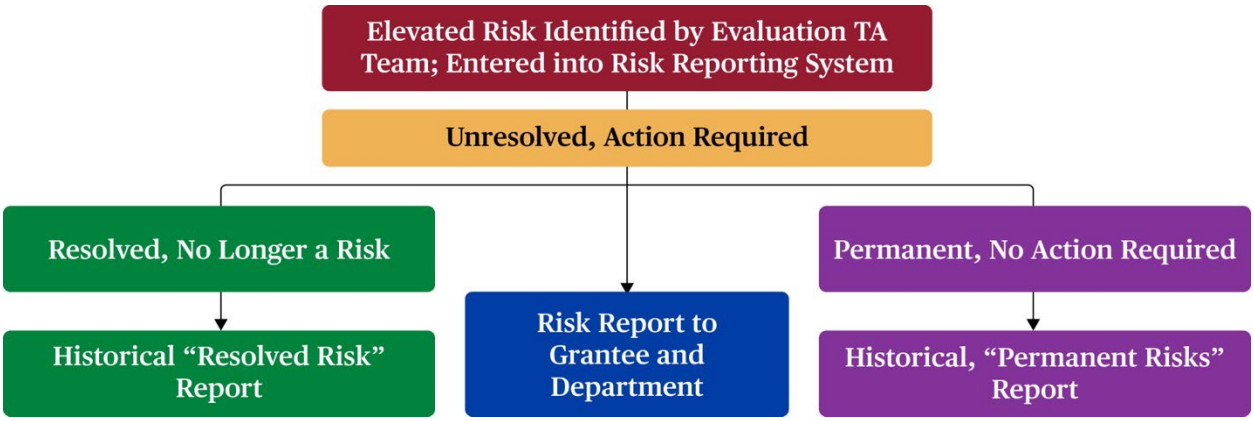
Responsive and proactive. The evaluation TA was characterized by frequent progress monitoring of the evaluations against program milestones and timely response to challenges that arose. This frequent progress monitoring allowed the TA team to proactively anticipate potential consequences of different design decisions and discuss the benefits and tradeoffs with the evaluator. In addition, reviewing draft study design plans provided the TA team an early opportunity to identify key risks to the strength of the evaluation design, the clarity of the plans to collect implementation data, or the initial proposed approach to assessing the fidelity of implementation of the grant strategies.

A.2.2 Role of Evaluation Technical Assistance in Continuous Improvement

Embedded within the i3 evaluation TA was a continuous risk assessment and improvement process (Exhibit A.7). Along with the TA team's reviews of evaluators' draft and final study design plans, monthly calls with a TA provider enabled the team to flag other risks as they emerged, but before too much time had elapsed to allow for a possible resolution. Once the TA provider had identified an issue, the evaluation TA team worked with the independent evaluator to try to eliminate or reduce the risk posed by that issue. Evaluators could "resolve" a risk if the TA team and the evaluator determined a path forward that eliminated the potential problem with the evaluation. When all potential avenues to resolve a risk had been exhausted without resolution, the TA team deemed the risk "permanent."

This ongoing risk assessment at the center of the evaluation TA supported continuous quality improvement for the i3 evaluations. As issues arose, the TA team provided guidance to the evaluators on options for addressing them that could ensure that the evaluations were on track to meet i3 Fund expectations. The evaluation TA team documented the issues facing the i3 evaluations and actions to reduce or eliminate the risks to the evaluations in a systematic "risk report" that was shared with the grants and the Department. Systematic documentation of and communication about risks to the quality of the evaluations allowed for proactive problem solving as well as managing expectations for evaluations with permanent risks.

Exhibit A.7: Continuous Improvement Process in i3 Evaluation Technical Assistance



APPENDIX B. STUDY DESIGN AND METHODS

This appendix describes the study design used to produce findings in the report. It provides additional information about the sample of i3 grants included in the study, data sources, study measures, systematic review procedures, and the analysis methods.

B.1 Study Purpose

The study examined how well the i3 Fund met its two primary goals, namely, to spur the development, testing, and dissemination of strategies to address persistent educational challenges and to strengthen and grow the evidence base for what works in education. Three questions guided the study design and implementation:

- What educational strategies did i3 grants implement, what were their goals and key components, and what student outcomes and grade levels did they target?
- Did i3 grants conduct high-quality evaluations of the implementation and effectiveness of these strategies?
- Did i3 grant evaluations find positive effects on student academic performance and educational progress?

To address these questions, the i3 study team conducted systematic reviews of evaluation reports and other data collected from a sample of i3 grants and their evaluators. The team assessed each grant against standard criteria to describe their educational strategies and to measure the quality of their evaluations and the effects of these strategies on students. These criteria translated the Department's expectations into the study's key measures. The use of standard criteria and systematic review procedures ensured that grants were assessed consistently despite wide variation in their strategies and evaluation designs.

B.2 Study Sample

The study sample consists of the 148 of 172 i3 grants that completed their evaluations and submitted their findings by August 2021.[7] The study team selected this date to ensure sufficient time to complete systematic reviews, analyses, and the report within the contract period for the i3 Fund evaluation.

B.2.1 All Funded i3 Grants

Across the seven annual cohorts of i3 grants, the i3 Fund awarded 172 grants (Exhibit B.1). Approximately two-thirds of these were Development grants, one-quarter were Validation grants, and less than one in ten were Scale-up grants. In the initial cohort in 2010, the i3 Fund awarded the largest number of grants and largest total funding amounts overall and for each grant type. After the initial cohort of grants in 2010, the i3 Fund made fewer total awards and awarded smaller total amounts across all grant types in subsequent years. Across all cohorts

combined, nearly 50 percent of funds went to Validation grants (more than $700 million). Scale-up and Development grants each received about 25 percent of i3 funds despite the fact that the number of Development grants awarded was more than 10 times the number of Scale-up grants made. This pattern reflects the Department's goal of investing in a pipeline of grants that would identify potential, but untested, solutions while expanding best practices to serve greater numbers of students.

Exhibit B.1: Number of i3 Grants and Total Amount Awarded, by Grant Type and Cohort, 2010–2016

Cohort	Grant Type									All Grant Types		
	Development Grants			Validation Grants			Scale-up Grants					
	Number	Percent of Grants in Cohort	Amount Awarded in Cohort ($million)	Number	Percent of Grants in Cohort	Amount Awarded in Cohort ($million)	Number	Percent of Grants in Cohort	Amount Awarded in Cohort ($million)	Number	Percent of Grants in Cohort	Amount Awarded in Cohort ($million)
2010	30	61	140.4	15	31	310.7	4	8	194.9	49	100	646.0
2011	17	74	50.3	5	22	72.8	1	4	25.0	23	100	148.1
2012	12	60	33.6	8	40	109.6	0	0	0.0	20	100	143.2
2013	18	72	53.1	7	28	82.6	0	0	0.0	25	100	135.7
2014	21	81	61.0	4	15	47.9	1	4	20.0	26	100	129.0
2015	7	50	18.6	4	29	45.1	3	21	59.3	14	100	123.1
2016	10	67	29.5	3	20	33.3	2	13	40.0	15	100	102.9
All cohorts	**115**	**67**	**386.6**	**46**	**27**	**702.0**	**11**	**6**	**339.2**	**172**	**100**	**1,427.8**

Sample size: 172 i3-funded grants.
Source: i3 Fund program records

B.2.2 Comparison of All i3 Grants to Sample of i3 Grants Included in the Study

The study sample included 148 i3 grants whose evaluators submitted their final evaluation reports by the August 2021 deadline required for the study team to complete this report. Because the study did not select grants using a random process such as a lottery, the likelihood that grants in the study sample differ systematically from all i3-funded grants is greater. For this reason, the study team compared grants in the study sample to those not in the sample on several characteristics that could be related to the study findings. These characteristics included grant type, grant cohort, which absolute priorities the grant addressed, and the potential strength of evidence that evaluations could produce if implemented as described in their study design plans.

- The share of Development, Validation, and Scale-up grant types in the study sample did not differ significantly from their shares among all funded grants (Exhibit B.2).
- The share of grants in the sample from later award cohorts was less than the share of grants from earlier cohorts (Exhibit B.3). Comparisons of the grants in the study sample to all i3 grants showed that this difference was statistically significant. Due to the August 2021 submission deadline for inclusion in the report, grantees in earlier cohorts had more time to report evaluation findings. In earlier award cohorts, grants frequently reported findings more than a year after end of their grant period, which was typically 5 years. In contrast, because the grant period for grants awarded in 2016 was December 2021, grants in this cohort had less than a full five-year grant period to submit findings in time for inclusion in the study sample. Grants in earlier cohorts had additional time beyond the formal end of their grant periods to submit findings for inclusion in the study.
- The share of grants in the study sample differed from the share of all i3 grants that addressed each of the Department's absolute priorities (Exhibit B.4). A statistical test showed that this difference was statistically significant. The relationship between absolute priority and sample inclusion may be due to the fact that the absolute priorities under which grants could apply changed over time. Grants funded in later cohorts were significantly less likely to submit their findings to the i3 study team than grants funded in earlier cohorts (Exhibit B.3), and the four absolute priorities first introduced in 2015 or 2016 had the smallest shares of grants included in the study sample.
- The share of grants in the study sample with evaluations that were designed to meet What Works Clearinghouse (WWC) standards, either with or without reservations, was lower than the share of all i3 grants with such study designs (Exhibit B.5). This difference in the potential strength of evidence approached statistical significance ($p=0.071$). However, this difference likely results from the August 2021 submission deadline for the inclusion of grants in this report: i3 grants awarded in 2014 or earlier

were less likely to propose designs with the potential to meet WWC standards and were more likely to report findings (p=0.043). All grants in the 2015 and 2016 cohorts had evaluation designs with the potential to meet WWC standards. This suggests that the share of grants whose evaluations met WWC standards might increase if the report included all 172 funded i3 grants.

Since the sample of grants in the study differs systematically from all i3-funded grants in terms of grant cohort, absolute priority, and evaluation design, the study findings based on that sample may not apply to the i3 Fund overall.

Exhibit B.2: Percent of Grants in the Study Sample, by Grant Type

Grant Type	All Grants Number	Grants in the Study Sample	
		Number	Percent of All Grants of the Grant Type
Development	115	99	86
Validation	46	40	87
Scale-up	11	9	82
Total	**172**	**148**	**86**

Note: Differences across grant type in the percent of grants included in the study sample were not statistically significant at the 0.05 level and did not approach significance, according to a chi-squared test.
Sample sizes: All i3-funded grants: 172. Grants in the study sample 148.
Source: i3 Fund program records

Exhibit B.3: Percent of Grants in the Study Sample, by Cohort

Cohort	Grant Period Start Date	Grant Period End Date	All Grants	Grants in the Study Sample	
			Number	Number	Percent of All Grants in the Cohort
2010	1/1/2011	12/31/2015	49	48	98
2011	1/1/2012	12/30/2016	23	22	96
2012	12/31/2012	12/30/2017	20	19	95
2013	12/31/2013	12/30/2018	25	24	96
2014	12/31/2014	12/30/2019	26	22	85
2015	12/31/2015	12/29/2020	14	9	64
2016	12/30/2016	12/29/2021	15	4	27
		Total	**172**	**148**	**86*** **

Note: Differences across cohorts in the percent of grants included in the study sample were statistically significant at the 0.001 level, according to a chi-squared test.
Sample sizes: All i3-funded grants: 172. Grants in the study sample 148.
Source: i3 Fund program records

Exhibit B.4: Percent of Grants in the Study Sample, by Primary Absolute Priority Addressed

Primary Absolute Priority Addressed[a]	All Grants		Grants in the Study Sample	
	First Cohort to Include the Absolute Priority	Number	Number	Percent of All Grants Addressing the Absolute Priority[b]
Improving parent and family engagement	2012	8	8	100
Improving academic outcomes for students with disabilities	2013	6	6	100
Improving the effectiveness of teachers or principals	2010	33	32	97
Effective use of technology	2013	11	10	91
Improving STEM education	2011	20	18	90
Use of data	2010	9	8	89
Serving rural communities[c]	2011	8	7	88
Turning around persistently low-performing schools	2010	28	24	86
Internationally benchmarked college and career-ready standards and assessments	2010	28	24	86
Improving academic outcomes for English language learners	2013	7	6	86
Implementing comprehensive high school reform and redesign	2015	3	2	67
Improving school climate, improving behavioral supports, and corrective education	2016	2	1	50
Influencing the development of non-cognitive factors	2015	7	2	29
Promoting diversity	2016	2	0	0

Notes:

[a] Although i3 Fund applicants could identify multiple absolute priorities in their grant applications, the Department identified one absolute priority as primary for each grant and shared this determination with the study team.

[b] Differences in the absolute priorities addressed by grants in the study sample and those addressed by all i3-funded grants were statistically significant at the .0001 level, according to a chi-squared test.

[c] An additional 11 grants, 8 of which were included in the study sample, also identified serving rural communities as an absolute priority, but for each grant, the Department determined that this absolute priority was secondary to another one identified in the grant application.

Sample sizes: All i3-funded grants: 172. Grants in the study sample 148.

Source: i3 grant applications

Exhibit B.5: Percent of Grants in the Study Sample, by Strength of Evidence of Grantee Evaluation Design

Potential Strength of Evidence of Evaluation Design	All Grants	Grants in the Study Sample	
	Number	Number	Percent of All Grants with the Potential Strength of Evidence
Did not have potential to Meet WWC Standards	18	18	100
Had potential to Meet WWC Standards	154	130	84

Note: Differences in the potential strength of evidence of grantee evaluation designs between the study sample and all i3 funded grants were not statistically significant at the 0.05 level but were statistically significant at the 0.10 level, according to a chi-squared test.
Sample sizes: All i3-funded grants: 172. Grants in the study sample 148.
Source: i3 Fund program records

B.3 Data Sources

Data to address the research questions came from Department i3 Fund program records, i3 grant evaluation reports, and structured data collected by the i3 study team from evaluators. Exhibit B.6 illustrates the timing of data collection for a grant with a five-year grant period.

Exhibit B.6: Data Collection Timeline

B.3.1 Department i3 Fund Program Records

At the start of each cohort's grant period, the Department provided project narratives from the applications submitted by the successful grants and contact information for the grant team, including the grant's evaluator. The Department also provided the study team with information about the program as whole, including the number and size of awards funded for Development, Validation, and Scale-up grants and the absolute priorities for each cohort of the grant competition.

B.3.2 i3 Grant Evaluation Reports

As mentioned in section A.1.1(b), i3 grantees were required to make their evaluation findings broadly available. The Department encouraged grantees to publish evaluation reports

electronically, for example through peer-reviewed journals or by submitting to the Education Resources Information Center (ERIC), a publicly accessible internet-based digital library of education research sponsored by the Institute of Education Sciences (IES) within the Department. The study team obtained copies of the i3 grantees' final evaluation reports from ERIC. When the evaluation report was not available on ERIC, the study team next searched the grantee organization and evaluator websites. If the findings were not available in either of these locations, the team requested these reports directly from the evaluator to conduct "unofficial" reviews following the WWC standards and procedures that were in effect at the time of the review. These reviews were considered unofficial because the What Works Clearinghouse (WWC) only reviews publicly available reports. Twenty-four grantees did not make their evaluation findings broadly available or share these findings with the study team before the study's cutoff date of August 2021. According to the Department, of these 24 grantees, nine have since released a public report, 11 have not yet released a public report, and four will not report findings. Of these four, three grants ended due to action by the Department or grantee bankruptcy before their evaluations were completed.

B.3.3 Structured Data Collected From i3 Grant Evaluators

During the initial two years of the grant period for each cohort, the study team reviewed and provided feedback on a draft and final study design plan submitted by each grant's evaluator. In these study design plans, evaluators described their plans to conduct an effectiveness and an implementation study using a standard template provided by the study team. Near the end of each grant's award period, or after evaluators had completed their evaluation reports, the study team asked evaluators to provide two additional types of data. First, because the description of the educational strategies implemented by grants varied across grantee evaluation reports, the study team drafted a summary of each grant's strategy covering the same key information and asked each evaluator to review this summary. Evaluators could submit feedback or revisions of this summary, after which the study team asked for approval of the final draft. This summary of the educational strategy helped the study team consistently identify the objectives of and educational levels targeted by the strategy. Second, the study team sent each evaluator a brief survey asking whether they conducted the key activities of the evaluation independently from members of the grant team responsible for developing and implementing the grant strategy.

B.4 Study Measures and Systematic Review Procedures

Using the data sources described above, the study team conducted systematic reviews to assess grants on key measures constructed for the study. These study measures were created to address the study's research questions (Exhibit B.7). The text below provides additional detail on these measures.

Exhibit B.7: Measures and Data Sources for Each Study Research Question

Research Question 1: What educational strategies did i3 grants implement, what were their goals and key components, and what student outcomes and grade levels did they target?	
Characteristics of i3 Grantee Educational Strategies	
Measure	**Data Source**
Objective	Structured data from grantee evaluators
Types of key components	i3 grant evaluation reports
Targeted student outcomes	i3 grant evaluation reports
Targeted educational levels	Structured data from grantee evaluators
Research Question 2: Did i3 grants conduct high-quality evaluations of the implementation and effectiveness of these strategies?	
Quality of i3 Grantee Evaluations	
Measure	**Data Source**
High-quality implementation data	i3 grant evaluation reports
Strength of evidence	i3 grant evaluation reports
Independence	Structured data from grantee evaluators
Adequate representation of students and schools that received the strategy	i3 grant evaluation reports
Research Question 3: Did i3 grant evaluations find positive effects on student academic performance and educational progress?	
i3 Grantee Evaluation Findings	
Measure	**Data Source**
Fidelity of implementation of key components	i3 grant evaluation reports
Effect on student outcomes	i3 grant evaluation reports
Magnitude of effects	i3 grant evaluation reports

B.4.1 Characteristics of i3 Grantee Educational Strategies

Reflecting the wide scope of the program, i3 grantees' educational strategies varied on several characteristics. To facilitate comparisons across the grants, the study team systematically coded descriptive information about their educational strategies into a common set of categories for each of four types of characteristics. Exhibit B.8 lists each measure, its data source, definition, and the coding method used to assign a value to each grant on the measure. For each of these four measures, the study team used a systematic review process to code grants. Two trained coders independently reviewed the data collected and assigned a code to each grant for each measure. A third, expert coder resolved any coding differences.

Exhibit B.8: Study Measures: Characteristics of Educational Strategies

Measure	Data Source	Definition and Coding Method
Objective	Structured data from evaluator	Primary immediate goal of the educational strategy, based on a systematic review of evaluator-approved summary of the grant's educational strategy (select one):

Measure	Data Source	Definition and Coding Method
		1 = Development of effective teachers and leaders 2 = Enhanced family engagement with school 3 = Improved college readiness/access 4 = Improved classroom curriculum and instruction 5 = School turnaround/reform 6 = Improved school climate and supports for students
Types of key components	i3 grant evaluation reports[a]	Whether the educational strategy included one or more of 11 types of key components, based on a systematic review of logic model for the educational strategy. For each type of key component (select all that apply): 1 = The strategy included one or more key component of this type 0 = The strategy did not include a key component of this type Types of key components: • Provide professional development • Develop/institute new curriculum and materials • Providing coaching • Support staff collaboration • Target leadership structures and supports • Involve parents/community members • Institute structural changes • Plan for and support assessment and data use • Provide college admissions workshops/mentoring • Select/evaluate staff • Provide services targeting individualized learning
Targeted student outcomes	i3 grant evaluation reports[a]	Student academic outcome(s) that the grant's educational strategy targeted, based on a systematic review of logic model for the educational strategy (select all that apply): 1 = Educational attainment 2 = Multiple academic subjects 3 = English language arts achievement 4 = Science achievement 5 = Math and science achievement (STEM) 6 = Math achievement
Targeted short-term non-academic outcomes	i3 grant evaluation reports[a]	Whether the educational strategy targeted one or more of three types of short-term non-academic student outcomes, based on a systematic review of logic model for the educational strategy. For each type of short-term outcome: 1 = The strategy targeted one or more short-term outcomes of this type 0 = The strategy did not target a short-term outcome of this type Types of short-term non-academic outcomes (select all that apply):

Measure	Data Source	Definition and Coding Method
		• Change in students' approach to learning, such as using self-monitoring skills to assess understanding or applying new study habits. • Changes to students' engagement in school, such as better attendance, improved time-on-task, greater interest in school activities. • Changes in students' attitudes or beliefs, such as improved self-confidence in learning, positive relationships with teachers and peers, higher aspirations for college and career.
Targeted teacher and school leader outcomes	i3 grant evaluation reports[a]	Whether the educational strategy targeted outcomes for teachers or principals, based on a systematic review of logic model for the educational strategy. 1 = The strategy targeted one or more teacher or school leader outcomes 0 = The strategy did not target a teacher or school leader outcome <u>Types of teacher and school leader outcomes included (select all that apply)</u>: • Changes in the quality of teacher instruction such as application of content area knowledge, provision of feedback to students, and supporting student engagement in learning. • Changes in the proportion of teachers who return to work in the same school or district from year to year. • Changes in school leader practice such as creating a safe and positive learning environment, working effectively with staff and students, and providing instructional leadership to teachers. • Changes in the proportion of school leaders who return to work in the same school or district from year to year.
Targeted educational levels	Structured data from evaluator	Educational level of students served by the educational strategy, based on a systematic review of evaluator-approved summary of the grant's educational strategy (select one): 1 = Elementary school 2 = Elementary and middle school 3 = Middle school 4 = Middle and high school 5 = High school 6 = K-12

[a] When the evaluation report did not include the logic model for the strategy, the study team used the logic model included in the evaluator's final study design plan.

B.4.1.(a) Objective

The study team classified each grant's educational strategy as having one primary objective. The objective is the immediate goal of the educational strategy, or the primary mechanism

through which the educational strategy was expected to produce improvements in student outcomes. For example, two strategies intended to improve student's math performance could target changes in distinct aspects of the educational environment—in the instructional methods and staff preparation or in family engagement. The primary objective of these two grants is to improve classroom instruction or to increase parent involvement.

To code grant objectives, the study team first looked in the literature for existing coding systems for overall goals of educational strategies. Since the study team did not identify existing coding systems that could be applied to the i3 grants, it developed post hoc coding systems based on qualitative analysis of the grant descriptions written by the intervention developers and the logic models for each grant's strategy. The coding system for Objectives was similar to the set of Absolute Priorities for grants that were established each year by the Department; each grant application was expected to identify at least one Absolute Priority addressed by their proposed strategy (see Exhibit A.3 for the list of priorities). However, these Absolute Priorities were not a strong basis for a coding system because they were not constant across cohorts and grantees were not limited to addressing only one or required to identify their primary objective if covering more than one.

To identify these objectives, the study team collected data from evaluators and then conducted a systematic review of those data. The study team drafted a summary of each grant's strategy based on its evaluation report. If the evaluation report did not include a description of strategy with these details, the study team based this summary on the evaluator's final study design plan. Each summary described the strategy's immediate goals, key components, and targeted educational level. Then, the study team asked the evaluator to review, edit, and approve the final version of this summary. Based on the final version of the summary, the study team applied a qualitative approach to classify immediate goals into an "objective" that captured similarities across these immediate goals. First, two members of the study team listed all unique immediate goals from the evaluator-approved summary, resulting in a list of 20 initial objectives. Through an iterative process, these two team members grouped these initial large lists into smaller sets of successively broader groups until agreeing that no further grouping was possible without obscuring important differences between the objectives. This process resulted in six non-overlapping objectives, listed in Exhibit B.8 (also see Exhibit 2 in the text of the report).

B.4.1.(b) Types of Key Components

Measuring the types of key components implemented by the i3 grants allowed the study to describe similarities and differences in another important characteristic of i3 grantee strategies. Key components of an educational strategy are the materials, services, and support delivered directly to teachers, school staff, and district officials receiving the strategy, and

they are the essential ingredients that other practitioners would need if they chose to adopt and implement the strategy in their own educational settings.

To code grant key components, the study team looked in the literature for existing coding systems for key practices to support change in the educational environment. Since the study team did not identify existing coding systems that could be applied to the i3 grants, it developed post hoc coding systems based on qualitative analysis of the grant descriptions written by the intervention developers and the logic models for each grant's strategy.

Using a qualitative approach, two members of the study team began by listing all of the unique key components labeled in the logic models included in each evaluation report (or the evaluators' final study design plans, when not included in evaluation reports). This resulted in a set of more than 125 unique key components. Next, the two study team members grouped similar key components into smaller, more broadly defined categories. For example, key components described as "shift to block scheduling" or "institute after-school academic homework program" were grouped together as the same type of key component, namely, "institute structural changes." By applying this grouping process in an iterative fashion, the two study team members identified 11 distinct types of key components, listed in Exhibit B.8 (also see Exhibit 3 in the report). Although the coding system was developed specifically for i3 grants, many of the key components, such as coaching or staff collaboration (sometimes called Professional Learning Communities) align with practices that are the focus of research on changing instruction and/or school climate.

B.4.1.(c) Targeted Student Outcomes

The study team classified the student outcomes targeted by each grant's educational strategy that were aligned with the i3 program's key outcomes of interest, namely academic achievement, decreased dropout rates, or increased high school graduation rates.[8] When a grant targeted academic achievement, the study team classified the achievement outcome based on its content area, either English language arts, science, mathematics, educational attainment, or multiple academic subjects. When a grant targeted STEM achievement it was coded under multiple academic subjects because it included math and science. Trained coders conducted a systematic review of the logic models of each grant's strategy to classify its student outcomes into one of six categories. Exhibit B.8 lists the six categories of student outcomes.

B.4.1.(d) Targeted short-term non-academic student outcomes

While all of the strategies implemented by grantees aimed to improve student academic outcomes, most also specified in their logic models short-term (or intermediate) student outcomes on the path to longer-term student achievement and attainment. The study team examined grantee logic models to identify any short-term non-academic outcomes that

grantees expected their strategies to improve. Exhibit B.8 lists three examples of these outcomes including students' approach to learning, student engagement, and students' attitudes or beliefs.

B.4.1.(e) Targeted teacher and school leader outcomes

While all of the strategies implemented by grantees aimed to improve student academic outcomes, many of the logic models for the strategies also included short-term (or intermediate) teacher and school leader outcomes as a short-term outcome on the path to longer-term student achievement and attainment. For these strategies, grantees hypothesized that improving the skills and knowledge of classroom teachers and principals would precede changes in targeted student outcomes. Examples shown in Exhibit B.8 include changes in the quality of teachers' instruction, changes in school leaders' practices to promote a supportive environment for learning, and improved teacher and principal retention.

B.4.1.(f) Targeted Educational Levels

Grants focused their strategies on improving outcomes for students at various educational levels. Using the summary of the educational strategy collected from evaluators' the study team applied the same systematic review process described above to identify the grade levels of students who received the strategy and classify them into one of the six categories. Exhibit B.8 lists the six categories of targeted educational levels.

B.4.2 Quality of i3 Grantee Evaluations

The second research question called for the study to measure the quality of evidence that grants produced. The study team assessed evaluations on four criteria aligned to the Department's expectations: whether the evaluation (1) provided high-quality implementation data, (2) produced evidence of effectiveness strong enough to meet WWC standards with or without reservations, (3) was conducted independently, and (4) adequately represented the populations receiving the educational strategy.

B.4.2.(a) High-Quality Implementation Data

The Department expected the i3 evaluations to provide high-quality implementation data by specifying the key components and outcomes of the strategy, along with a measurable threshold for acceptable implementation for each key component (see Exhibit A.5). These data identify elements of the strategy that grants implemented according to plan and those in need of improvement. These data also inform other practitioners considering whether to adopt an effective strategy about the resources they would need to implement a strategy and potential challenges they might encounter while attempting to implement the strategy as the developer did during the i3 grant. To assess whether i3 grants met the Department's expectations for high quality implementation data, the study team established nine criteria

and reviewed each grant's evaluation report to assess the grant against these criteria (Exhibit B.9). To be considered high-quality, the evaluation's implementation data had to meet all nine of these criteria.

Exhibit B.9: Study Measures: Quality of i3 Evaluations (Part 1)

Measure	Data Source	Definition and Coding Method
High-quality implementation data	i3 grant evaluation reports[a]	Whether the grant met nine criteria for a high-quality implementation data, based on a systematic review of the implementation data in the evaluation report. For each grant's evaluation: 1 = The evaluation met all nine criteria for high-quality implementation data 0 = The evaluation did not meet one or more criteria for high quality implementation data <u>Criteria for high-quality implementation data</u>: 1. Specified a logic model for the educational strategy 2. Logic model identified key components of the strategy 3. Logic model identified mediators of the strategy 4. Logic model identified student outcomes that the strategy is designed to improve 5. Measured implementation fidelity of each key component in the logic model 6. Periodically measured implementation fidelity, namely, whether the strategy was implemented as intended in • At least once per year for two or more years for strategies implemented in multiple years • At least once for strategies implemented in a single year 7. Collected implementation fidelity data in all sites receiving the strategy, a sample of these sites selected using a random process, or in the sites included in the analysis of the strategy's effectiveness 8. For each key component, specified a minimum threshold for acceptable implementation fidelity for all sites receiving the strategy combined 9. Measured and reported whether each key component was implemented with minimum acceptable fidelity for all sites receiving the strategy combined

[a] In some instances, evaluation reports did not include implementation findings. For these grants, evaluators submitted implementation data using a standard template that the study team created for this purpose.

The first four criteria acknowledge the importance of logic models to planning an informative implementation study. The logic model specifies the necessary ingredients of an educational strategy, namely its key components, the student outcomes that the strategy is intended to improve, and the mediators, namely, the intermediate changes in the classroom, school, that

the developer expects to produce change in student performance. Asking the developer to make explicit these aspects of their educational strategy would help the i3 grant evaluator identify what to measure in their implementation study and which measures would describe successful and less successful elements of implementation.

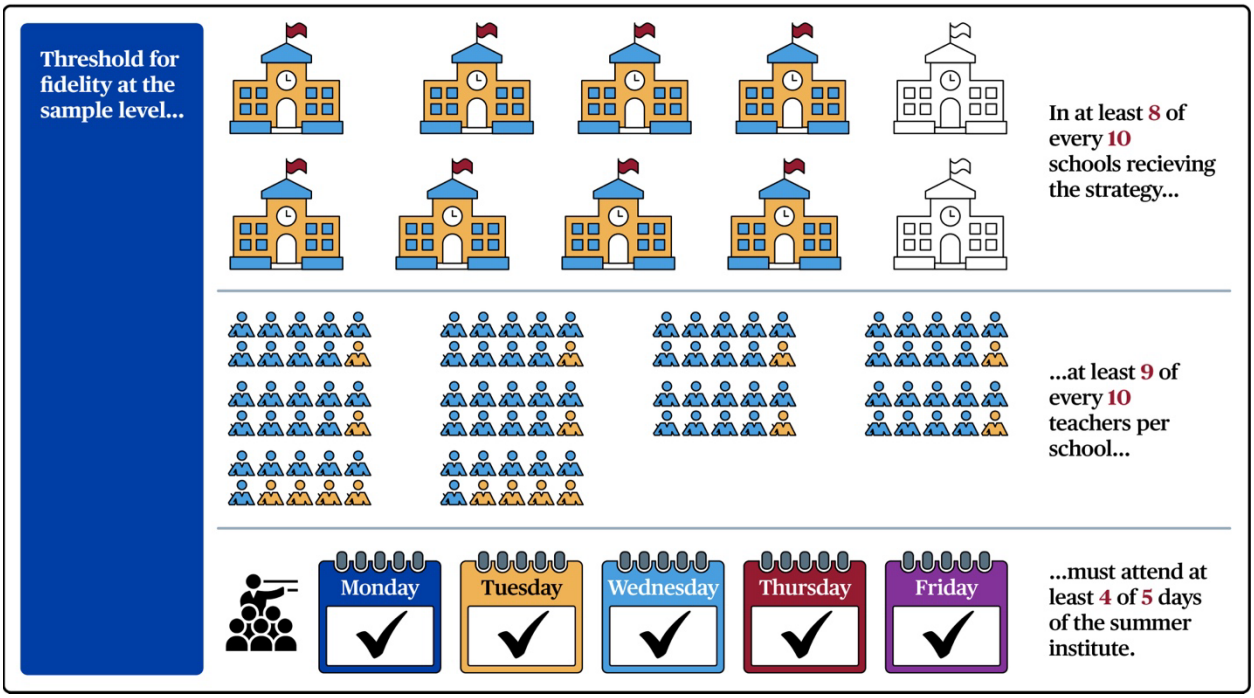
The remaining five criteria focus on measuring implementation fidelity. Understanding the fidelity of implementation provides a context to help readers understand the effect of the strategy on student performance, for example, whether lack of an effect resulted from poor implementation, or if a positive effect occurred, to what extent the actual implementation adhered to the strategy as prescribed. The Department also sought to ensure that evidence-based practitioners could reproduce the implementation of the strategy in other educational settings with adequate fidelity to benefit their own students.

The criteria also require grant evaluators to measure how faithfully the grant team members responsible for implementation actually delivered each key component of the strategy. This criterion ensured that fidelity data covered all of the ingredients that the grant team had identified as an essential part of the strategy. Evaluators could define these measures as they chose, so long as the measure could be expressed as a quantity.

Next, the evaluator had to collect implementation data at least once annually for at least two of the years in which students and schools received the strategy. For grants that implemented their educational strategy in just a single year, a single round of fidelity data collection was required. This criterion reflected the Department's expectation that the evaluations would allow for periodic assessment of progress, and helped ensure that fidelity data would capture changes in implementation over time, whether those changes reflected improved fidelity or declining fidelity over the years in which the strategy was implemented.

Evaluators also had to measure fidelity in the sites–districts, schools, or classrooms–receiving the strategy, either all sites, in a group of sites selected using a random process such as a lottery, or in the group of sites that formed the sample for the analysis of the strategy's effectiveness which, in turn, was expected to represent the full sample of implementing sites.

Exhibit B.10: Example of a Threshold for Adequate Fidelity at the Sample Level of All Sites Implementing an i3 Grant's Educational Strategy



For each key component, the evaluator had to specify a minimum threshold to indicate acceptable fidelity of implementation, a minimum target that the organization responsible for delivering the strategy's key components needed to meet or exceed. Furthermore, the evaluator had to define each threshold at a level that included all sites implementing the strategy or the representative group of sites selected for the implementation fidelity data collection). To illustrate, Exhibit B.10 shows a threshold for fidelity for one key component of an educational strategy, a summer professional development institute for third- and fourth-grade teachers.

Finally, the evaluator had to report how well each key component was implemented relative to its threshold. This last criterion ensured that the study team could assess the fidelity of implementation for each grant's educational strategy, which was a key measure for addressing research question 3 (see Section B.4.3).

The study team followed a systematic review process to assess each grant against these nine criteria. Trained coders reviewed the grantee evaluation reports, examining their logic models (the first four criteria) and implementation fidelity data (the next five criteria). When the evaluation reports did not include a logic model or implementation fidelity data these data, the study team asked evaluators to submit them using a template that the study team created. For each grant, a third, expert coder resolved any discrepancies between the two independent coders.

B.4.2.(b) Strength of Evidence

A primary goal of the i3 Fund was to add to the evidence base for what works in education. In addition to providing high-quality implementation data, high-quality evaluations provide confidence that conclusions about the effects of the strategy on student outcomes were due to the educational strategy and would not have occurred otherwise. Exhibit B.11 lists the remaining three study measures used to assess the quality of grantee evaluations. The first of these three remaining measures reflects this need to distinguish studies that can support causal claims from those that cannot. To produce trustworthy findings, evaluations should also be free of influence from individuals or organizations with an actual or perceived interest in reporting evidence of positive effects. For this reason, the Department required i3 grants to include an evaluator independent of grant team members responsible for developing or implementing the educational strategy. Finally, the study also measured whether the schools and students included in the data and analyses on which evaluators based the effectiveness findings were similar to the entire set of schools and students served by the educational strategy. This measure reflects the Department's expectation that the evaluation reflects the settings and students served by the i3-funded strategy.

Exhibit B.11: Study Measures: Quality of i3 Evaluations (Part 2)

Measure	Data Source	Definition and Coding Method
Strength of evidence	*What Works Clearinghouse* (WWC) reviews of i3 grant evaluation findings[a]	Highest evidence rating for the targeted student outcomes based on a WWC review of the grant's evaluation findings. Each grant received one rating: 0 = Does not meet WWC standards 1 = Meets WWC standards with reservations 2 = Meets WWC standards without reservations
Independence	Structured data from evaluator	Whether the evaluation met three criteria for independence for at least one student outcome, based on the evaluator's responses to a survey: Without the participation or influence of the organization that developed or implemented the educational strategy, the evaluator: 1. Collected the outcome data[b] 2. Analyzed the outcome data 3. Reported findings for the outcome 1 = The evaluation met all 3 criteria for independence for at least one student outcome 0 = The evaluation did not meet one or more criteria for independence for any student outcome

Measure	Data Source	Definition and Coding Method
Adequate representation of settings and students served by the strategy	i3 grant evaluation reports[c]	Whether the students and settings included in the analysis of the strategy's effectiveness adequately represented those students and settings served by the i3-funded strategy, based on a systematic review of grant evaluation reports: 1 = The analysis of the strategy's effectiveness included (a) all of the students and settings served by the i3-funded strategy, or: (b) a sample of these students and settings selected using a random process such as a lottery; or (c) a sample of these students and settings selected using a non-random process that excluded • no more than 25 percent of the schools served by the strategy[d] • and no more than 10 percent of the teachers or students served by the strategy based on characteristics related to the targeted student outcomes[e,f] 0 = The analysis of the strategy's effectiveness included a sample of students and settings served by the i3-funded strategy selected using a non-random process, and this sample excluded • more than 25 percent of the schools served by the strategy • or more than 10 percent of the teachers or students served by the strategy based on characteristics related to the targeted student outcomes.

[a] When official WWC reviews were not available, the member of the i3 study team with What Works Clearinghouse certification completed an unofficial review of the i3 grant evaluation report following WWC standards and procedures. See Section B.4.3(a) for further detail.

[b] When an evaluator obtained data such as achievement test scores, student attendance, or grade point average that districts or states routinely collect, the data were considered to be independent, even if officials from the state or local education agency were part of the grant team.

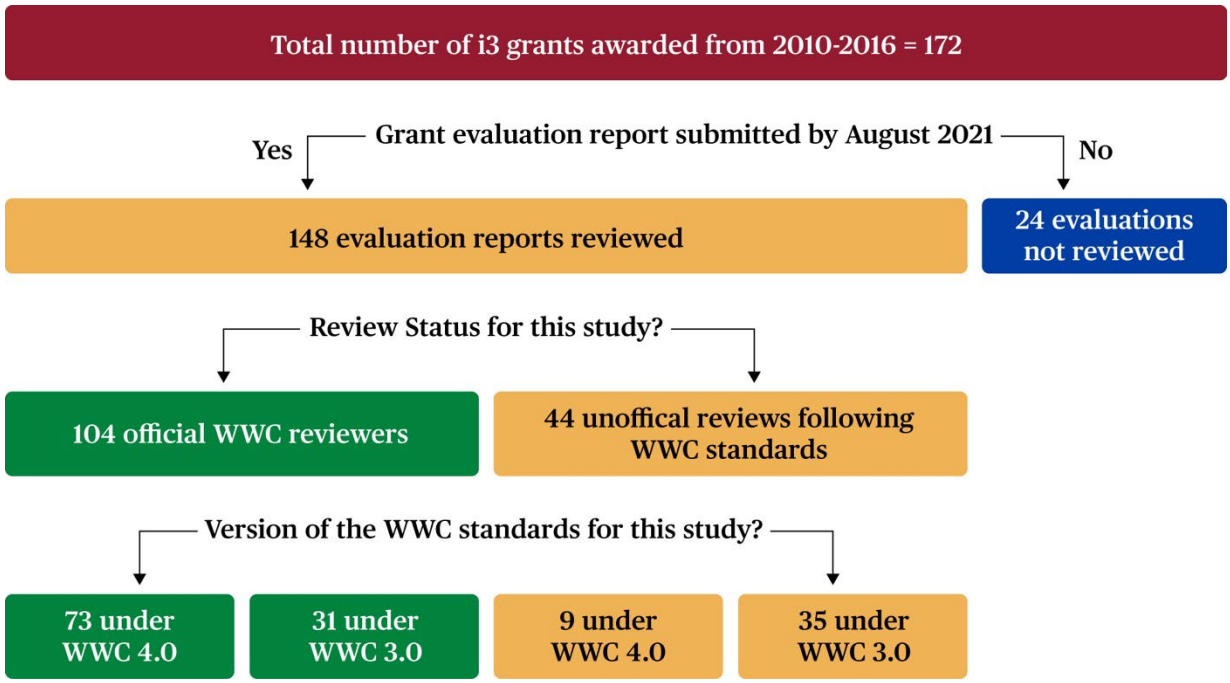
[c] In some instances, evaluation reports did not include sufficient detail for the study team to assess adequate representation. For these grants, evaluators submitted this information separately using a standard template that the study team created for this purpose.

[d] For i3-funded strategies implemented outside of a school setting, the analysis of the strategy's effectiveness could exclude, using a non-random process, no more than 25 percent of the settings in which the grant implemented the strategy.

[e] If the analysis of the strategy's effectiveness excluded some of the schools or other settings served by the i3-funded strategy, then the study could exclude, using a non-random process, no more than 10 percent of the teachers or students in the remaining schools included in the study.

[f] For this report, characteristics related to targeted student outcomes included students' prior achievement, prior academic performance (such as grade point average), race, ethnicity, eligibility for free- or reduced-price lunch or other income characteristic, qualification for special education services, English language proficiency, and teacher years of experience.

Exhibit B.12: Type of WWC Review Conducted For Strength of Evidence Ratings



Because the Department's goals for the i3 evaluations were largely aligned to the standards of the What Works Clearinghouse (WWC) the study followed WWC standards and procedures to measure the strength of evidence of grantee evaluations.[9] While the study based most of the strength of evidence ratings on the guidelines that the WWC set forth in version 4.0 of its Standards and Procedures Handbook and version 4.0 of the Review of Individual Studies Protocol (RISP), ratings for some i3 evaluation reports followed earlier guidelines from version 3.0 of the WWC's Standards and Procedures Handbook (Exhibit B.12).[10,11]

Similarly, the study based most strength of evidence ratings on "official WWC reviews," meaning the review drew on a publicly available evaluation report and the results of the review are available on the WWC website.[12] However, because the goal of this study is to include as many of the i3 grant evaluations as possible, the report also includes "unofficial WWC reviews" for a set of i3 evaluations without a publicly available report.[13] Instead, evaluators for these grants provided the information necessary for the review directly to the study team. For these unofficial reviews, members of the study team with WWC reviewer certification conducted the reviews following the then-current version of the WWC guidelines. When the official WWC or unofficial review of i3 evaluation reports included multiple findings, the study team assigned the grant the highest evidence rating achieved across findings.

B.4.2.(c) Independence

To assess whether i3 grant evaluations met the Department's expectation that evaluations be free from any perceived or actual conflict of interest, the study team measured independence of each evaluation using the three criteria defined in Exhibit B.11. For each student outcome, the study team asked the evaluator to indicate whether they had collected the outcome data, analyzed it, and reported findings independently, namely, without the participation of the organization that developed or implemented the educational strategy.[14] If one or more outcomes met all three criteria for independence, the study team rated the evaluation as independent.

B.4.2.(d) Adequate Representation of Students and Settings That Received the Strategy

While a main goal for the grant evaluations was to produce rigorous evidence of the effect of the i3-funded strategy using an independent evaluator, it was also important that analyses of the strategy's effectiveness adequately reflected the students and settings served under the i3 grant. Adequate representation was particularly important for Scale-up and Validation grants, who were expected to implement their strategies at a larger scale than before. Because the effect of the strategy indicates how much the performance of an average student included in the study improved (or not), the Department wanted students in the study to represent those who received the strategy. If the study excluded groups of students and settings served and these groups differed systematically from those included in the analysis of the strategy's effectiveness, consumers of the evaluation could erroneously conclude that the findings applied to the full group of students and settings served by the strategy.

Because evaluators may have had legitimate reasons to exclude some settings and students receiving the strategy from the analysis of the strategy's effectiveness, the criteria shown in Exhibit B.11 allowed for these exclusions under certain conditions that would still ensure that the study reflected those receiving the strategy. To maintain adequate representation of all those receiving the strategy, evaluators could select settings and students using a random process, such as a lottery. If evaluators selected settings and students in some other, non-random way, then the evaluator had to limit both the share of settings excluded for any reason, and the share of teachers or students excluded based on characteristics related to the targeted student outcomes. For this report, these characteristics included: students' prior achievement, prior academic performance (such as grade point average), race, ethnicity, eligibility for free- or reduced-price lunch or other income characteristic, qualification for special education services, English language proficiency, and teacher years of experience. Prior research has shown that differences in each of these characteristics are related to differences in student academic achievement or educational attainment. The greater the share of schools, teachers, or students served by the strategy that an evaluator excluded using

a non-random process, the higher the risk that the evaluation findings would not apply to the full group of students and settings served by the strategy.

Using the criteria described in Exhibit B.11, the study team conducted a systematic review of i3 grantee evaluation reports. Two trained coders independently reviewed each report and assigned a rating. A third, expert coder resolved any discrepancies between the two independent coders.

B.4.3 i3 Grantee Evaluation Findings

A key goal of the i3 Fund was to identify new effective strategies and reproduce, on a larger scale, positive findings for strategies with prior evidence of effectiveness. Another goal was to identify which strategies districts and schools could expect to implement as the developer of the strategy intended, and which might be difficult to implement as planned. Exhibit B.13 defines the study measures used in this report to assess whether i3 met these goals.

B.4.3.(a) Fidelity of Implementation of Key Components

Because implementation fidelity can relate to the effectiveness of a strategy, it is important to know whether the key components of the strategy were delivered as intended. If an i3 grant yields no meaningful improvement in student outcomes, a measure of fidelity can help determine whether this lack of effect resulted, at least in part, from poor implementation of the key components or shortcomings inherent to the strategy. For this reason, the study team measured whether grants implemented the key components of their strategies with adequate fidelity, based on the minimum thresholds that grants established for each key component.

Exhibit B.13: Study Measures: i3 Grantee Evaluation Findings

Measure	Data Source	Definition and Coding Method
Implementation fidelity	i3 grant evaluation reports[a]	Whether half or more of the key components of the strategy were implemented at or above the threshold for minimum acceptable fidelity in at least 50 percent of the years in which the evaluator collected implementation fidelity data, based on a systematic review of the evaluation report. 1 = Demonstrated adequate fidelity 0 = Did not demonstrate adequate fidelity

Measure	Data Source	Definition and Coding Method
Effect on student outcomes	WWC reviews of i3 grant evaluation findings[b]	Summary of the i3-funded strategy's effects on student outcomes across findings rated • Meets WWC standards with reservations or • Meets WWC standards without reservations where: a positive finding is an effect on a student outcome that is greater than 0 and statistically significant after applying any necessary adjustment to reduce the likelihood of a finding significant result by chance and a negative finding is an effect on a student outcome that is less than 0 and statistically significant after applying any necessary adjustment to reduce the likelihood of a finding significant result by chance: Positive = at least one positive finding and no negative findings Negative = at least one negative finding and no positive findings Mixed = at least one positive finding and one negative finding Null = no statistically significant findings
Magnitude of effects	WWC reviews of i3 grant evaluation findings[a]	Average of the effect sizes for outcomes with findings rated: • Meets met WWC standards with reservations or • Meets WWC standards without reservations for the i3-funded strategy.

[a] In some instances, evaluation reports did not include sufficient detail for the study team to assess fidelity. For these grants, evaluators submitted this information separately using a standard template that the study team created for this purpose.
[b] When official WWC reviews were not available, members of the i3 study team with *What Works Clearinghouse* certification completed an unofficial review of the i3 grant evaluation report following WWC standards and procedures. See Section B.4.3(a) for further detail.
[c] When a study yields multiple findings for outcomes that are closely related, there is a risk that the criteria for statistical significance are too lenient. In these circumstances, under version 4.0 of the WWC Procedures Handbook, the WWC used a procedure called the Benjamini-Hochberg correction to adjust the highest p-value below which findings are statistically significant. See the WWC Procedures Handbook, Version 4.0, page 21, and Appendix F.

The study team conducted systematic reviews of grantee evaluation reports to assess the implementation fidelity of their strategies. Two trained coders independently reviewed each report to identify the fidelity threshold for each key component, the implementation fidelity data reported, and compared the two to determine the share of key components that met or exceeded this threshold. They repeated this process for each year in which the evaluation collected fidelity data and assigned a rating using the criteria in Exhibit B.13. A senior study team member resolved any discrepancies between the two independent coders.

B.4.3.(b) Effect on Student Outcomes

Educational practitioners need a concise summary of whether the strategy resulted in improvement on measures of student outcomes, no improvement, lower achievement or

progress, or a mix. Practitioners want to know the pattern of findings across all of the ways that student success was measured. Because the evaluations could yield a complex mix of findings across multiple outcomes, the study team adopted a qualitative summary rating for each grant, following WWC guidelines. Exhibit B.13 defines the summary effect on student outcomes measure and lists the four possible ratings.

When an official WWC review was available, the study team used the qualitative summary rating in the official WWC review. When an official review was unavailable, the study team applied the WWC criteria following the then-current version of the WWC Standards and Procedures Handbook. By applying a standard method of summarizing across grantee findings, the study could succinctly convey the primary pattern of findings without prioritizing any individual finding over another.

B.4.3.(c) Magnitude of Effects

Just as it is important to convey whether a strategy yielded improved, diminished, or no change in targeted student outcomes, it is also important to characterize the size of these changes. To characterize the magnitude of individual findings, the study team used the effect size identified by the WWC review. To convey the magnitude of findings for an i3 grant's strategy overall, the study team calculated the average of the individual effect sizes as described in Exhibit B.13. When an official WWC review was unavailable, members of the study team certified as WWC reviewers conducted an unofficial WWC review and calculated both the individual effect sizes and the average effect size following the then-current version of the WWC Standards and Procedures Handbook.

B.5 Analytic Methods

To describe i3 grantee educational strategies, assess the quality of grantee evaluations, and summarize the findings for student outcomes, the study conducted descriptive analyses. These analyses produced summary statistics such as counts, percentages, and averages of measures constructed using the data sources and systematic review methods described above (Section B.4). This section describes three other analyses. One examined how well the study sample reflected the characteristics of all i3-funded grants. A second analysis examined whether the Department successfully encouraged applicants for a Development grant, starting in 2015, to propose an evaluation with the potential to meet WWC standards, with or without reservations. A third analysis explored potential relationships between i3 grant evaluations' positive findings and the characteristics of their educational strategies.

B.5.1 Comparing the Study Sample to All i3-Funded Grants

To determine whether the sample of grants differed systematically from all i3-funded grants, the study team conducted a series of chi-squared tests. Each test compared the percentage of

grants in the study sample with a given characteristic to the percentage of grants excluded from the study sample with that characteristic. These characteristics included grant type, grant cohort, which absolute priorities the grant addressed, and the strength of the evaluation designs. The p-value associated with each chi-squared test indicates the statistical significance of any differences between grants in the study sample and those not in the sample based on the characteristic tested. Differences were considered statistically significant if the p-value was 0.05 or smaller. A statistically significant chi-squared test indicates that the differences were likely systematic and not due to chance. Results of these analyses appear in Section B.2 (see Exhibits B.2, B.3, B.4, and B.5).

B.5.2 Examining Grantee Progress Along the i3 Fund's Tiered Structure for Evidence Building

An important aspect of the i3 Fund was its tiered structure, which allowed the Department both to test new educational strategies and to build evidence for successful strategies implemented at increasingly broad scales. To examine whether the program supported grantees to progress from lower to higher tiers of evidence, the study team examined the number of i3 grantees with strategies that proved effective that received a subsequent grant at the next tier from i3 or from its successor program, Education Innovation and Research (EIR). For this analysis, the study team counted the number of i3 Development grantees who received a subsequent i3 Validation or EIR Mid-phase grant and the number of i3 Validation grantees who received a subsequent i3 Scale-up or EIR Expansion grant. Results of this analysis appear in Appendix C (see Section C.4.3 and Exhibit C.16).

B.5.3 Exploring the Relationship Between the Department's Grant Selection Criteria and the Strength of Evidence of Development Grant Applicants' Evaluation Designs

Throughout the seven years of the i3 Fund, the Department's expectation for Development grant evaluations was to produce evidence of promise. However, starting in the 2015 and 2016 Development grant competitions, the Department added an incentive for Development grant applicants to propose evaluations designed to meet WWC standards with reservations. This incentive came in the form of a selection criterion worth up to 20 additional points in the grant competition.[15] To explore the relationship of this incentive to the strength of the evaluation designs in Development grant applications, the i3 study team reviewed the proposed evaluation designs in these applications. The study team assessed whether the proposed evaluation used one of three designs, each of which had the potential to meet WWC standards, to determine which students, classrooms or schools would receive or would not receive the strategy:

1. An experimental design, namely a design that used a random assignment process,

2. A design that would attempt to demonstrate that the students, classrooms, or schools that received the strategy were similar, before receiving that strategy, to the students, classrooms or schools that did not receive the strategy (a quasi-experimental design with equivalent comparison group), or
3. A design that compared outcomes for students who would receive the strategy to outcomes for those who would not receive it over multiple years before and after (a comparative interrupted time series design).

The study team rated applications that proposed an experiment as having the potential to meet WWC standards without reservations. The study team rated applications that proposed one of the two other designs above as having potential to meet WWC standards with reservations. The study team rated applications that proposed designs lacking a comparison group as not having the potential to meet WWC standards.

Two trained coders independently reviewed each application and rated the strength of the proposed evaluation design. Using these ratings, the study team conducted two chi-squared tests. One chi-squared test compared the share of proposed evaluations, across all cohorts, that had or did not have the potential to meet WWC standards. A second chi-square compared the share of studies proposed in 2010-2014 that had, or did not have, potential to meet WWC standards to the share of studies proposed in 2015 or later that had, or did not have, potential to meet WWC standards. Differences were considered statistically significant if the p-value was 0.05 or smaller. A statistically significant chi-squared test indicates that the differences were likely systematic and not due to chance. Results of these analyses appear in Appendix C (see Section C.4.4 and Exhibit C.17).

B.5.4 Exploring Changes in Strength of Evidence in Development Grantee Evaluations from Application to Final Design

As part of the evaluation technical assistance provided by the Department's contractor, grantees revised the evaluation proposed in their grant application and prepared a final evaluation design plan. Although Validation and Scale-up grantees had already proposed evaluation designs that had potential to meet WWC evidence standards, among Development grantees, only some had proposed evaluation designs that had this potential – because they were not required to propose a design that could meet WWC standards. To examine whether the TA helped improve the potential strength of evidence of Development grantee evaluations, the study team compared the strength of evaluations in these grantee applications to that in their revised and final evaluation designs. Results of this analysis appears in Appendix C (See Section C.4.5 and Exhibit C.18).

B.5.5 Exploring Potential Relationships Between Characteristics of i3 Grantee Educational Strategies and Effects on Student Outcomes

While a main goal of the i3 Fund was to identify effective strategies for education practice, it may also be important to explore whether educational strategies have specific features in common that increase the likelihood of positive effects on students. Evidence-based educational decision-makers and practitioners may find it difficult to adopt a proven strategy taken as a whole, particularly if some features of the strategy are expensive or time-consuming to implement or difficult to adapt for the specific needs of their students and schools. However, if there were features that tend to make strategies successful across different settings and contexts, then future studies could focus more precisely on testing the effectiveness of strategies that include similar features. To look for these kinds of features across the i3 grantee strategies, the study team conducted a series of regression analyses that included the 148 i3 grants in the study sample. The goal of this analysis was to explore relationships between characteristics of educational strategies and their effectiveness at improving student outcomes. This section describes these techniques. Results of these analyses appear in Appendix C (see Section C.4.6 and Exhibit C.19).

In each regression, the outcome, also called the dependent variable, indicated whether the educational strategy improved targeted student outcomes: this dependent variable equaled "1" if the strategy had positive effects on targeted student outcomes and "0" otherwise. Grants rated "0" included, therefore, those with negative, null, or mixed effects and those that did not meet WWC standards for strength of evidence.

Because the outcome was binary and took on only the values of "0" and "1", the study team used a logistic regression approach. Logistic regressions describe the relationship between the dependent variable and the explanatory variables in terms of probabilities. Each logistic regression produced a "likelihood ratio test" and an associated p-value for statistical significance, which indicates whether there is a systematic relationship between the set of characteristics included in the model and the outcome. If the likelihood ratio test is statistically significant, then this set of characteristics can help identify which educational strategies are more likely to have positive effects on targeted student outcomes.

Exploring multiple analysis models increases the chance of detecting relationships where none exist. If one were to test for a relationship between positive effects on student outcomes and each of 20 characteristics of educational strategies, for example, one or two relationships (five percent) would likely be statistically significant at conventional levels purely by chance, even if there was no underlying relationship between any characteristic and positive effects on student outcomes. This is called the "multiple comparisons" problem. Alternately, given that the sample includes 148 grants that range widely across many different characteristics, true relationships may exist and not be detectable. The likelihood ratio test indicates whether

knowing the values of the characteristics included in the model improves the accuracy with which we can predict that a strategy will improve student outcomes. To reduce the multiple comparisons problem, the presentation of the model results will only include details on the relationship between each characteristic in the model and positive effects on student outcomes if the likelihood ratio test is significant.

Each analysis tested the relationship between positive effects and one of three sets of characteristics of educational strategies (Exhibit B.14). In addition to characteristics whose measures are defined above in Exhibit B.8, these exploratory analyses included two additional measures, mediators, and targeted short-term non-academic outcomes, defined in Exhibit B.15.

Exhibit B.14: Characteristics of i3 Grantee Strategies Included in Exploratory Analyses

	Analysis Model 1	Analysis Model 2	Analysis Model 3
Characteristics Included			
Objective[a]	●	●	
Types of key components[a]	●	●	
Targeted educational levels[a]	●	●	●
Mediators[b]	●		●
Targeted short-term, non-academic outcomes[a]	●		●
Targeted student outcomes[a]	●		●

[a] Exhibit B.8 defines the following study measures: Objective, types of key components, targeted educational levels, targeted student outcomes, and targeted short-term non-academic outcomes.
[b] Exhibit B.15 defines mediators.

Exhibit B.15: Measures Used in Exploratory Analyses

Measure	Data Source	Definition and Coding Method
Mediators	i3 grant evaluation reports[a]	Whether the educational strategy included one or more of 3 types of mediators, based on a systematic review of logic model for the educational strategy. For each type of mediator: 1 = The strategy included one or more mediator of this type 0 = The strategy did not include a mediator of this type Types of mediators: • School level mediator representing a change in school structures or processes, such as extended learning time, school level team meetings, professional learning communities for teachers • Classroom level mediator representing a change in classrooms, such as a new curriculum, change in teacher's instructional techniques, use of formative assessments to monitor student learning

Measure	Data Source	Definition and Coding Nethod
		• Family mediator representing changes in families' engagement with their child's education, participation in school activities, knowledge of steps to prepare for college

B.5.5.(a) Analysis Model 1

Model 1 specifies the relationship between positive findings for a strategy and the characteristics of that strategy. Model 1 defines the probability that a particular educational strategy *s* had a positive effect on targeted student outcomes ($Y_s = 1$) as the probability that a linear combination of characteristics and an error term is greater than 0 as follows:

$$\Pr\{Y_s = 1\} = \Pr\left\{\beta_0 + \sum_j \beta_{1j} X_{js}^{obj} + \sum_k \beta_{2k} X_{ks}^{key} + \sum_l \beta_{3l} X_{ls}^{edu} + \sum_m \beta_{4m} X_{ms}^{med} + \sum_n \beta_{5n} X_{ns}^{st_{out}} + \sum_o \beta_{6o} X_{os}^{out} + \varepsilon_s^1 > 0\right\}$$

where $\varepsilon_s^1 \sim iid\ Logistic.$

The analysis model includes each characteristic as a set of indicator variables where the values correspond to those shown in Exhibit B.8 or B.15:

X_{js}^{obj} indicates the objective of the strategy *s* with six dummy variables, $j = 1, \ldots, 6$ each of which is 1 if the strategy has that objective and 0 if the strategy did not have that objective:

= 1 or 0 for Development of effective teachers and leaders
= 1 or 0 for Enhanced family engagement with school
= 1 or 0 for Improved educational attainment
= 1 or 0 for Improved classroom curriculum and instruction
= 1 or 0 for School turnaround/reform
= 1 or 0 for Improved school climate and supports for students

X_{ns}^{key} indicates the types of key components of the strategy *s* with 11 dummy variables, $n = 1, \ldots, 11$:

= 1 or 0 for Provide professional development
= 1 or 0 for Develop/institute new curriculum and materials
= 1 or 0 for Provide coaching
= 1 or 0 for Support staff collaboration
= 1 or 0 for Target leadership structures and supports
= 1 or 0 for Involve parents/community members

= 1 or 0 for Institute structural changes
= 1 or 0 for Plan for and support assessment and data use
= 1 or 0 for Provide college admissions workshops/mentoring
= 1 or 0 for Select/evaluate staff
= 1 or 0 for Provide services targeting individualized learning

X_{ls}^{edu} indicates the educational level targeted by the strategy *s* with six dummy variables, $l = 1, \ldots, 6$:

= 1 or 0 for Elementary
= 1 or 0 for Elementary and middle
school = 1 or 0 for Middle school
= 1 or 0 for Middle and high school
= 1 or 0 for High school
= 1 or 0 for K-12

X_{ms}^{med} indicates the mediators of the strategy *s* with three dummy variables, $m = 1, \ldots 3$:

= 1 or 0 for changes in school structures or processes
= 1 or 0 for changes in classroom resources, instruction, or environment
= 1 or 0 for changes in families' engagement with child's education

$X_{ns}^{st_{out}}$ indicates the targeted short-term non-academic outcomes of the strategy *s* with three dummy variables, $n = 1, \ldots, 3$:

= 1 or 0 for changes in students' approach to learning
= 1 or 0 for changes in students' engagement in school
= 1 or 0 for changes in students' attitudes and beliefs

And

X_{os}^{out} indicates the targeted student outcomes of the strategy *s* with six dummy variables, $o = 1, \ldots, 6$:

= 1 or 0 for Educational attainment
= 1 or 0 for Multiple academic subjects
= 1 or 0 for English language arts achievement
= 1 or 0 for Science achievement
= 1 or 0 for Math and science achievement (STEM)
= 1 or 0 for Math achievement

The second line of the equation specifies that the error term ε_s^1 is independently and identically distributed according to the logistic distribution.

B.5.5.(b) Analysis Model 2

Model 2 included a smaller set of the characteristics included in Model 1, namely the objective, types of key components, and educational level targeted by the strategy. Model 2 specified the relationship between the probability that educational strategy *s* had positive effects on student outcomes ($Y_s = 1$) and the characteristics of that strategy as

$$\Pr\{Y_s = 1\} = \Pr\left\{\gamma_0 + \sum_j \gamma_{1j} X_{js}^{obj} + \sum_k \gamma_{2k} X_{ks}^{key} + \sum_l \gamma_{3l} X_{ls}^{edu} + \varepsilon_s^2 > 0\right\}, \text{ where}$$

$$\varepsilon_s^2 \sim iid\ Logistic.$$

B.5.5.(c) Analysis Model 3

Model 3 included another set of the characteristics included in Model 1, namely the mediators, targeted short-term non-academic outcomes, and the student academic outcome targeted by the strategy. Model 3 specified the relationship between the probability that educational strategy *s* had positive effects on student outcomes ($Y_s = 1$) and the (characteristics of that strategy as

$$\Pr\{Y_s = 1\} = \Pr\left\{\delta_0 + \sum_l \delta_{1l} X_{ls}^{edu} + \sum_m \delta_{2m} X_{ms}^{med} + \sum_n \delta_{3n} X_{ns}^{st_{out}} + \sum_o \delta_{4o} X_{os}^{out} + \varepsilon_s^3 > 0\right\} \text{ where}$$

$$\varepsilon_s^3 \sim iid\ Logistic.$$

APPENDIX C. SUPPLEMENTAL TABLES AND INFORMATION ON STUDY FINDINGS

This appendix provides additional details on the findings presented in the report. The underlying counts and percentages presented in this section were used to generate the exhibits in the report on the characteristics of i3 grants that submitted findings, the strength of the evidence generated by these grants, and their findings.

C.1 Characteristics of i3 Grants in the Study

The report provides a summary of key characteristics of the 148 grants included in the study. These include the number and size of grants, their objectives, the key components of their educational strategies, and the student outcomes and educational levels targeted by these strategies.

C.1.1 Number and Size of Grants in the Study Sample

Exhibit 1 in the report summarizes the number of i3 grants awarded and their size, in terms of total amount awarded for each grant type across all cohorts. Exhibit C.1a provides details per cohort, by type of grant, and overall for all i3 grants. Exhibit C.1b shows the *average* amount awarded per cohort, by type of grant, and overall for all i3 grants. Exhibit C.1c provides details per cohort, by type of grant, and overall, for the grants in the study sample. Exhibit C.1d shows the *average* amount awarded per cohort, by type of grant, and overall, for the grants in the study sample.

C.1.2 Objectives of i3 Grants

The i3 Fund allowed grants wide latitude in identifying the goals and types of educational strategies they proposed to meet those goals. Using logic models included in grantees' study design plans, the i3 study team identified the immediate goals of each grant's proposed educational strategy and classified these goals into one of six "objectives." (See Appendix B for details on this data collection). Exhibit 2 in the report shows the percentage of i3 grants that identified each of these six objectives. Exhibit C.2 shows the numbers of grants underlying the percentages in Exhibit 2 in the report.

Exhibit C.1a: Number, Percent, and Total Funding of All i3 Grants, by Cohort, Grant Type, and Overall

Cohort	Development Grants			Validation Grants			Scale-up Grants			All Grant Types		
	Number	Percent of Grants in Cohort	Total Funding ($millions)	Number	Percent of Grants in Cohort	Total Funding ($millions)	Number	Percent of Grants in Cohort	Total Funding ($millions)	Number	Percent of Grants in Cohort	Total Funding ($millions)
2010	30	61	140	15	31	311	4	8	195	49	100	646
2011	17	74	50	5	22	73	1	4	25	23	100	148
2012	12	60	34	8	40	110	0	0	0	20	100	143
2013	18	72	53	7	28	82	0	0	0	25	100	135
2014	21	81	61	4	15	48	1	4	20	26	100	129
2015	7	50	19	4	29	45	3	21	59	14	100	123
2016	10	67	30	3	20	33	2	13	40	15	100	103
Total	**115**	**67**	**387**	**46**	**27**	**702**	**11**	**6**	**339**	**172**	**100**	**1,428**

Sample size: All grants: 172. Development grants: 115. Validation grants: 48. Scale-up grants: 11.
Source: i3 Fund program records

Exhibit C.1b: Number, Percent, and Average Size of All i3 Grants, by Cohort, Grant Type, and Overall

Cohort	Development Grants			Validation Grants			Scale-up Grants			All Grant Types		
	Number	Percent of Grants in Cohort	Average Grant Size ($millions)	Number	Percent of Grants in Cohort	Average Grant Size in Cohort ($millions)	Number	Percent of Grants in Cohort	Average Grant Size in Cohort ($millions)	Number	Percent of Grants in Cohort	Average Grant Size ($millions)
2010	30	61	4.7	15	31	20.7	4	8	48.7	49	100	13.2
2011	17	74	3.0	5	22	14.6	1	4	25.0	23	100	6.4
2012	12	60	2.8	8	40	13.7	0	0	0.0	20	100	7.2
2013	18	72	2.9	7	28	11.8	0	0	0.0	25	100	5.4
2014	21	81	2.9	4	15	12.0	1	4	20.0	26	100	5.0
2015	7	50	2.7	4	29	11.3	3	21	19.8	14	100	8.8
2016	10	67	3.0	3	20	11.1	2	13	20.0	15	100	6.9
Total	**115**	**67**	**3.4**	**46**	**27**	**15.3**	**11**	**6**	**30.8**	**172**	**100**	**8.3**

Sample size: All grants: 172. Development grants: 115. Validation grants: 46. Scale-up grants: 11.
Source: i3 Fund program records

Exhibit C.1c: Number, Percent, and Total Funding of Grants in the Study Sample, by Cohort, Grant Type, and Overall

Cohort	Development Grants			Validation Grants			Scale-up Grants			All Grant Types		
	Number	Percent of Grants in Cohort	Total Funding ($millions)	Number	Percent of Grants in Cohort	Total Funding ($millions)	Number	Percent of Grants in Cohort	Total Funding ($millions)	Number	Percent of Grants in Cohort	Total Funding ($millions)
2010	29	60	137	15	31	311	4	8	195	48	100	642
2011	17	77	50	4	18	58	1	5	25	22	100	133
2012	12	63	34	7	37	104	0	0	0	19	100	138
2013	17	71	50	7	29	82	0	0	0	24	100	132
2014	18	82	53	4	18	48	0	0	0	22	100	100
2015	4	44	11	2	22	23	3	33	59	9	100	94
2016	2	50	6	1	25	12	1	25	20	4	100	38
Total	**99**	**67**	**341**	**40**	**27**	**639**	**9**	**6**	**299**	**148**	**100**	**1,279**

Sample size: All grants in the study: 148. Development grants: 99. Validation grants: 40. Scale-up grants: 9.
Source: i3 Fund program records

Exhibit C.1d: Number, Percent, and Average Size of Grants in the Study Sample, by Cohort, Grant Type, and Overall

Cohort	Development Grants			Validation Grants			Scale-up Grants			All Grant Types		
	Number	Percent of Grants in Cohort	Average Grant Size ($millions)	Number	Percent of Grants in Cohort	Average Grant Size in Cohort ($millions)	Number	Percent of Grants in Cohort	Average Grant Size in Cohort ($millions)	Number	Percent of Grants in Cohort	Average Grant Size ($millions)
2010	29	60	4.7	15	31	20.7	4	8	48.7	48	100	13.4
2011	17	77	3.0	4	18	14.4	1	5	25.0	22	100	6.0
2012	12	63	2.8	7	37	14.9	0	0	0.0	19	100	7.3
2013	17	71	2.9	7	29	11.8	0	0	0.0	24	100	5.5
2014	18	82	2.9	4	18	12.0	0	0	0.0	22	100	4.6
2015	4	44	2.8	2	22	11.7	3	33	19.8	9	100	10.5
2016	2	50	3.0	1	25	12.0	1	25	20.0	4	100	9.5
Total	**99**	**67**	**3.4**	**40**	**27**	**16.0**	**9**	**6**	**33.2**	**148**	**100**	**8.6**

Sample size: All grants in the study: 148 Development grants: 99. Validation grants: 40. Scale-up grants: 9.
Source: i3 Fund program records

Exhibit C.2: Objectives of i3 Grants: Number and Percent of Grants

Objective	Development Grants		Validation Grants		Scale-up Grants		All Grant Types	
	Number	Percent of Development Grants	Number	Percent of Validation Grants	Number	Percent of Scale-up Grants	Number	Percent of All Grants
Improved classroom curriculum and instruction	29	29	19	48	5	56	53	36
School turnaround / reform	33	33	4	10	1	11	38	26
Improved college readiness/access	15	15	9	23	1	11	25	17
Development of effective teachers and leaders	10	10	5	13	2	22	17	11
Enhanced family engagement with school	7	7	2	5	0	0	9	6
Improved school climate and supports for students	5	5	1	3	0	0	6	4
Total	**99**		**40**	**1**	**9**		**148**	

Sample size: All grants in the study: 148. Development grants: 99. Validation grants: 40. Scale-up grants: 9.
Source: Structured data from grantee evaluators.

C.1.3 Types of Key Components of i3 Grants

To meet their objectives, i3 grants proposed educational strategies and described the key components of these strategies in their logic models. These key components included the resources and services provided, activities conducted, and support offered to schools and students receiving the educational strategy. Using grantee logic models, the i3 study team classified key components into eleven categories. Exhibit 3 in the report illustrates the percentage of grants that incorporated one or more of eleven different key components in their educational strategies. Exhibit C.3 below shows the underlying numbers for Exhibit 3 in the report.

Exhibit C.3: Types of Key Components of i3 Grantee Educational Strategies, Overall and by Grant Type

Type of Key Component	Development Grants		Validation Grants		Scale-up Grants		All Grant Types	
	Number	Percent of Development Grants	Number	Percent of Validation Grants	Number	Percent of Scale-up Grants	Number	Percent of All Grants
Provide professional development	78	79	34	85	7	78	119	80
Develop/institute new curriculum and materials	53	54	23	58	2	22	78	53

Type of Key Component	Development Grants		Validation Grants		Scale-up Grants		All Grant Types	
	Number	Percent of Development Grants	Number	Percent of Validation Grants	Number	Percent of Scale-up Grants	Number	Percent of All Grants
Provide coaching	29	29	12	30	4	44	45	30
Support staff collaboration	25	25	12	30	0	0	37	25
Target leadership structures and supports	16	16	10	25	5	56	31	21
Involve parents/community members	18	18	9	23	0	0	27	18
Institute structural changes	15	15	7	18	1	11	23	16
Select/evaluate staff	11	11	8	20	2	22	21	14
Provide college admissions workshops/mentoring	17	17	3	8	1	11	21	14
Plan for and support assessment and data use	14	14	7	18	0	0	21	14
Provide services targeting individualized learning	7	7	3	8	0	0	10	7

Percentages do not sum to 100 percent because each grant's educational strategy could include one or multiple types of key components.
Sample size: All grants in the study: 148. Development grants: 99. Validation grants: 40. Scale-up grants: 9.
Source: i3 grant evaluation reports

C.1.4 Targeted Student Outcomes

As expected by the program, all i3 grants measured at least one student academic outcome. Exhibit 4 in the report provides data on the percentage of i3 grants that measured each of six different student outcomes. Exhibit C.4a below shows the underlying numbers for Exhibit 4 in the report.

Exhibit C.4a: Targeted Student Academic Outcomes, Overall and by Grant Type

Targeted Student Outcome	Development Grants		Validation Grants		Scale-up Grants		All Grant Types	
	Number	Percent of Development Grants	Number	Percent of Validation Grants	Number	Percent of Scale-up Grants	Number	Percent of All Grants
Multiple academic subjects	41	41	11	28	3	33	55	37
English language arts achievement	15	15	11	28	4	44	30	20
Educational attainment	15	15	9	23	1	11	25	17
Math and science achievement (STEM)	15	15	1	3	0	0	16	11
Math achievement	9	9	4	10	1	11	14	10
Science achievement	4	4	4	10	0	0	8	5

Targeted Student Outcome	Development Grants		Validation Grants		Scale-up Grants		All Grant Types	
	Number	Percent of Development Grants	Number	Percent of Validation Grants	Number	Percent of Scale-up Grants	Number	Percent of All Grants
Total	**99**		**40**		**9**		**148**	

Sample size: All grants in the study: 148. Development grants: 99. Validation grants: 40. Scale-up grants: 9.
Source: i3 grant evaluation reports

C.1.5 Targeted Short-term Non-academic Student Outcomes

More than three-fourths of grantees (77 percent) also targeted short-term non-academic student outcomes that grantees thought would precede and support the longer-term changes in academic success or educational attainment. For example, some grantees theorized that their educational strategies would improve student engagement or self-confidence, which would in turn, contribute to students' improved academic performance. Using grantee logic models, the i3 study team identified three categories of targeted short-term, non-academic outcomes. Exhibit C.4b shows the number and percent grants overall and by grant type that included one or more short-term non-academic outcomes in their logic models.

Exhibit C.4b: Targeted Short-term Non-academic Outcomes, Overall and by Grant Type

Short-term Non-academic Outcomes	Development Grants		Validation Grants		Scale-up Grants		All Grant Types	
	Number	Percent of Development Grants	Number	Percent of Validation Grants	Number	Percent of Scale-up Grants	Number	Percent of All Grants
Approaches to learning	51	51	21	52	1	11	74	50
Engagement	21	20	13	32	2	22	47	32
Attitudes and beliefs	33	33	12	30	1	11	40	27
Total	**76**	**77**	**32**	**80**	**4**	**44**	**112**	**76**

Sample size: All grants in the study: 148. Development grants: 99. Validation grants: 40. Scale-up grants: 9.
Source: i3 grant evaluation reports

C.1.6 Targeted Short-term Teacher and School Leader Outcomes

More than half of grantees (59 percent) identified a short-term teacher outcome that they thought would precede changes in student outcomes, and a few grantees identified a short-term school leader outcome. Using grantee logic models, the i3 study team identified two categories of teacher and school leader outcomes: instructional or leadership practice and retention. Exhibit C.4b shows the number and percent grants overall and by grant type that targeted one or more of these outcomes.

Exhibit C.4c: Targeted Short-term Teacher and School Leader Outcomes, Overall and by Grant Type

Targeted Short-term Teacher and School Leader Outcomes	Development Grants		Validation Grants		Scale-up Grants		All Grant Types	
	Number	Percent of Development Grants	Number	Percent of Validation Grants	Number	Percent of Scale-up Grants	Number	Percent of All Grants
Total teacher outcomes (practice and/or retention)	79	80	38	95	8	89	87	59
Total school leader outcomes (practice and/or retention)	10	10	1	2	1	11	8	12

Sample size: All grants in the study: 148. Development grants: 99. Validation grants: 40. Scale-up grants: 9.
Source: i3 grant evaluation reports

C.1.7 Targeted Educational Levels

The i3 Fund allowed grants to target strategies to students at any K-12 educational level. Exhibit C.5 shows the number and percentage of i3 grants, by grant type and overall, that targeted students in elementary, middle, high school grades, or combination of these levels. The study team defined elementary grades as kindergarten through grade 5, middle grades as grades 6 through 8, and high school as grades 9 through 12. A grant that targeted students in grades 5 and 6, for example, was included in the "elementary and middle grades" level whereas a grant that targeted grades 6 and 7 was included in the "middle grades" level. The largest share of grants, 27 percent, targeted elementary grades.

Exhibit C.5: Targeted Educational Levels, Overall and by Grant Type

Educational Level	Development Grants		Validation Grants		Scale-up Grants		All Grant Types	
	Number	Percent of Development Grants	Number	Percent of Validation Grants	Number	Percent of Scale-up Grants	Number	Percent of Grants
Elementary grades	24	24	12	30	4	44	40	27
Elementary and middle grades	6	6	2	5	1	11	9	6
Middle grades	14	14	4	10	1	11	19	13
Middle and high school grades	16	16	4	10	0	0	20	14
High school grades	19	19	10	25	1	11	30	20
K-12	20	20	8	20	2	22	30	20
Total	**99**		**40**		**9**		**148**	

Sample size: All 148 grants that submitted evaluation findings.
Source: Structured data from grantee evaluators

C.2 Quality of i3 Grantee Evaluations

The Department required each grant to carry out a high-quality evaluation of the implementation and effectiveness of their strategy. The study team assessed the quality of i3 grantee evaluations using the measures and procedures described in Appendix B.

C.2.1 High-Quality Implementation Data

To assess whether each i3 grant met the Department's expectation to produce high-quality implementation data, the study team examined whether grantee evaluations met each of nine criteria (see Appendix B for these criteria). The report indicates that, across all grant types, 93 percent of i3 evaluations met all of the criteria for high-quality implementation data. Exhibit C.6 presents the number and percent of grants that met the criteria by grant type.

Exhibit C.6: High-Quality Implementation Data, Overall and by Grant Type

Grant Type	Total Number of Grants	Grants with High-Quality Implementation Data	
		Number of Grants	Percent of Grant Type
Development	99	92	93
Validation	40	37	93
Scale-up	9	9	100
All Grants	**148**	**138**	**93**

Sample size: All grants in the study: 148. Development grants: 99. Validation grants: 40. Scale-up grants: 9.
Source: i3 grant evaluation reports

C.2.2 Strength of Evidence

To assess the strength of evidence generated by grantee evaluations, the i3 study team conducted or obtained official *What Works Clearinghouse* (WWC) systematic evidence reviews when possible and conducted unofficial WWC reviews based on the same standards and review procedures used by the WWC when this was not possible (see Appendix B for details). Exhibit 5 in the report shows the percentage of grants that met or did not meet WWC standards, overall and by grant type. As noted in Appendix B, the strength of evidence reflects the highest WWC evidence rating for any finding reported based on the version of the WWC standards available at the time of the review. Exhibit C.7 below shows the underlying numbers for Exhibit 5 in the report.

Exhibit C.7: Strength of Evidence from i3 Grantee Evaluations, Overall and by Grant Type

Grant Type	What Works Clearinghouse (WWC) Evidence Rating					
	Does Not Meet WWC Standards		Meets WWC Group Design Standards with Reservations		Meets WWC Group Design Standards without Reservations	
	Number	Percent of Grant Type	Number	Percent of Grant Type	Number	Percent of Grant Type
Development	33	33	50	51	16	16
Validation	2	5	23	58	15	37
Scale-up	1	11	2	22	6	67
All Grants	**36**	**24**	**75**	**51**	**37**	**25**

Note: Differences by grant type in the WWC evidence rating were statistically significant at the .01 level, according to a chi-squared test.
Sample size: All grants in the study: 148. Development grants: 99. Validation grants: 40. Scale-up grants: 9.
Source: i3 grant evaluation reports

C.2.3 Independence of the i3 Evaluations

To ensure that evaluations were objective and free from any real or perceived conflict of interest, the Department required i3 grants to hire an independent evaluator responsible for collecting and analyzing effectiveness data and for reporting the findings. The i3 study team determined whether grants met independence criteria for the findings identified in their evaluation reports using the data collection procedures described in Appendix B. Exhibit C.8 below shows the number and percent of grants that met these criteria for independence. Nine grants did not meet these independence criteria because the evaluator indicated that the organization that developed or implemented the educational strategy participated in data collection, analysis, or reporting (see Appendix B).

Exhibit C.8: Independence Rating for i3 Grants, Overall and by Grant Type

Grant Type	Total Number of Grants	Independent		Not Independent	
		Number of Grants	Percent of Grant Type	Number of Grants	Percent of Grant Type
Development	99	90	91	9	9
Validation	40	40	100	0	0
Scale-up	9	9	100	0	0
All grants	**148**	**139**	**94**	**9**	**6**

Sample size: All grants in the study: 148. Development grants: 99. Validation grants: 40. Scale-up grants: 9.
Source: Structured data from grantee evaluators

C.2.4 Adequate Representation of the Students and Schools that Received the i3-Funded Strategy

A key goal of the i3 program was to expand the evidence base on effective educational strategies at increasing levels of scale and for different types of populations and settings. To achieve this, the Department expected i3 evaluations to reflect the full set of students and

sites served under the grant. Validation grants were expected to expand the reach of their strategies to the regional or national level and Scale-up grants to the national level. To assess whether the findings from i3 grant evaluations adequately represented the outcomes for all students and schools that received the i3-funded strategy, the study team measured the "alignment" between the students and schools included in the evaluation and the students and schools served by the educational strategy. To measure this, the study team applied the criteria described in Appendix B. Although these findings are not included in the report, Exhibit C.9 shows that 68 percent of evaluations included students and schools that adequately reflected the population that received the educational strategy.

Exhibit C.9: i3 Grantee Evaluations that Adequately Represented the Students and Schools Served by the i3-Funded Strategy, Overall and by Grant Type

Grant Type	Total Number of Grants	Evaluations That Adequately Represented Students and Schools Served by the Strategy	
		Number of Grants	Percent of Grant Type
Development	99	71	72
Validation	40	27	68
Scale-up	9	3	33
All Grants	**148**	**101**	**68**

Note: Differences by grant type in the adequate representation of students and schools served by the i3-funded strategy were statistically significant at the .02 level, according to a chi-squared test.
Sample size: All grants in the study: 148. Development grants: 99. Validation grants: 40. Scale-up grants: 9.
Source: i3 grant evaluation reports

C.3 i3 Grantee Evaluation Findings

To determine whether the grantees were able to implement their i3-funded strategies, which is critical information for both strategy improvement and other educational practitioners, the study team assessed the adequacy of implementation fidelity of each grant, using the measures and procedures described in Appendix B. Another goal of the i3 Fund was to identify new effective strategies or replicate strategies with prior evidence of effectiveness on a larger scale. To determine how well grants met this goal, the study team assessed whether and how much grant strategies increased student success, using the measures and procedures described in Appendix B.

C.3.1 Fidelity of Implementation of Key Components of the Educational Strategies

Because the Department expected grants to measure the extent to which they implemented their proposed strategies as planned, the study team assessed whether grants delivered the key components of these strategies with adequate fidelity. The report states that 68 percent of grants implemented the majority of the key components of their educational strategies as planned, with Development grants making up the majority of grants that did not meet this criterion. Exhibit C.10a shows the number and percentages of grants reporting adequate

fidelity of their key components by grant type, using the entire sample of 148 grants that submitted findings. Exhibit C.10b reports the same information but limited to the 138 grants whose evaluations met criteria for high-quality implementation data (see Exhibit C.6).

Exhibit C.10a: i3 Grants with Adequate Fidelity of Implementation, Overall and by Grant Type

Grant Type	Total Number of Grants	Key Components Were Implemented with Adequate Fidelity	
		Number of Grants	Percent of Grant Type
Development	99	63	64
Validation	40	30	75
Scale-up	9	8	89
All Grants	**148**	**101**	**68**

Sample size: All grants in the study: 148. Development grants: 99. Validation grants: 40. Scale-Up grants: 9.
Source: i3 grant evaluation reports

Exhibit C.10b: i3 Grants with Both High-Quality Implementation Data and Adequate Fidelity of Implementation, Overall and by Grant Type

Grant Type	Total Number of Grants	Key Components Were Implemented with Adequate Fidelity	
		Number of Grants	Percent of Grant Type
Development	92	63	68
Validation	37	30	81
Scale-up	9	8	89
All Grants	**138**	**101**	**73**

Sample size: Grants whose evaluations met criteria for high-quality implementation data: 138. Development grants: 92. Validation grants: 37. Scale-up grants: 9.
Source: i3 grant evaluation reports

C.3.2 Effects on Student Academic Outcomes

To demonstrate the extent to which the i3 Fund expanded the evidence base on effective educational strategies, the i3 study team examined the effects of the educational strategies on student academic performance. Exhibit 6 in the report illustrates the percentage of i3 grant evaluations where:

- Effects were positive, meaning performance improved,
- Effects were negative, meaning student performance declined,
- Effects were null, meaning student performance did not change,
- Effects were mixed—meaning performance improved for some outcomes but declined for others, or
- No student academic outcome met WWC standards (no effect size calculated).

Exhibit C.11a shows the underlying numbers for Exhibit 6, which includes all 148 grants in the study sample. However, because 37 of the 148 grants in the study sample did not meet WWC standards for a student outcome, Exhibit C.11b shows the effects for the 111 grants that met WWC standards for at least one student outcome.

Exhibit C.11a: Effects of i3 Grant Strategies on Student Academic Outcomes, Overall and by Grant Type

Grant Type	Total Number of Grants	No Student Outcome Met WWC Standards		Negative		Null		Mixed		Positive	
		Number	Percent of Grant Type	Number	Percent of Grant Type	Number	Percent of Grant Type	Number	Percent of Grant Type	Number	Percent of Grant Type
Development	99	33	33	3	3	45	46	3	3	15	15
Validation	40	3	8	1	2	17	42	0	0	19	48
Scale-up	9	1	11	0	0	3	33	0	0	5	56
All Grants	**148**	**37**	**25**	**4**	**3**	**65**	**44**	**3**	**2**	**39**	**26**

Note: One Validation grant that met WWC standards without reservations is included under "No student academic outcome met WWC standards" because the WWC reviewed the study under the "teacher excellence" review protocol and therefore the review did not include student outcomes. Differences by grant type in the effects of i3-funded strategies on student outcomes were statistically significant at the .01 level, according to a chi-squared test.
Sample sizes: All grants in the study: 148. Development grants: 99. Validation grants: 40. Scale-up grants: 9.
Source: i3 grant evaluation reports

Exhibit C.11b: Effects of i3 Grant Strategies on Student Outcomes for Grants with at Least One Student Finding That Met WWC Standards, Overall and by Grant Type

Grant Type	Total Number of Grants	Negative		Null		Mixed		Positive	
		Number	Percent of Grant Type	Number	Percent of Grant Type	Number	Percent of Grant Type	Number	Percent of Grant Type
Development	66	3	5	45	68	3	5	15	23
Validation	37	1	3	17	45	0	0	19	50
Scale-up	8	0	0	3	38	0	0	5	63
All Grants	**111**	**4**	**4**	**65**	**58**	**3**	**3**	**39**	**35**

Sample size: 111 grants with a finding for a student outcome that met WWC standards.
Source: i3 grant evaluation reports

C.3.3 Magnitude of Effects

To understand how well the i3 Fund met its ultimate goal–improving student outcomes–it is important to know how much change in student performance the program generated. Exhibits 7a-7d in the report display the average effect size of the i3 grantees' educational strategies on student academic performance for evaluations that met WWC standards for findings in each of the four content areas with more than 50 findings: English language arts, mathematics, science, and school attendance, progress, and attainment. Exhibits C.12a-C.12d show additional information for each content area in Exhibit 7, including the average effect size for each grant's educational strategy, the direction and statistical significance of the effect size (positive, negative, null, or mixed), and the number of outcomes targeted by each grant. Exhibits C.12e-C.12h show the same information for each of four additional content areas

targeted by grants: student academic readiness, knowledge, or skill in areas other than English language arts, mathematics, or science; student performance in social studies; student social-emotional learning and behavior; and teacher outcomes.[16]

Exhibit C.12a: Average Magnitude of Effects on Student Performance in English Language Arts for All Findings That Met WWC Standards

Grant Type	Name of Educational Strategy	Average Effect Size	Effect on English Language Arts	Number of Outcomes
Scale-up	Reading Recovery	0.578	Positive	8
Development	Everyday Arts for Special Education (EASE)	0.447	Null	1
Development	Arts for Learning Lessons (A4L) program	0.296	Positive	11
Development	Spheres of Proud Achievement in Reading for Kids (SPARK) Program	0.287	Positive	8
Development	Leading with Learning	0.230	Null	1
Development	Turnaround with Increased Learning Time	0.224	Positive	3
Development	HEROES	0.219	Positive	2
Development	System for Educator Effectiveness Development (SEED)	0.210	Null	3
Validation	Utah Preparing Students Today for a Rewarding Tomorrow (UPSTART) Reading Program	0.173	Positive	7
Validation	Reading Enhances Achievement During the Summer (READS)	0.170	Positive	12
Validation	College-Ready Writers Program	0.167	Positive	4
Scale-up	College, Career, and Community Writers Program (C3WP)	0.161	Positive	4
Validation	Pathway to Academic Success (Pathway Project)	0.146	Positive	2
Validation	Child-Parent Center Education Program	0.140	Null	1
Development	Literacy and Academic Success for English Learners through Science (LASErS)	0.138	Null	7
Scale-up	KIPP	0.135	Positive	16
Validation	StartSmart K-3 Plus Program	0.133	Positive	7
Development	The Expository Reading and Writing Course (ERWC)	0.130	Positive	1
Validation	GO College (An Enhanced Version of Talent Search)	0.117	Null	3
Validation	Higher Achievement	0.115	Positive	2
Development	Bay State Reading Institute	0.095	Null	1
Validation	New Teacher Center Induction Model	0.090	Positive	1
Development	Drive to Write	0.087	Null	7
Scale-up	Success for All (SFA)	0.080	Positive	4
Scale-up	Teach for America (TFA)	0.065	Positive	6

Grant Type	Name of Educational Strategy	Average Effect Size	Effect on English Language Arts	Number of Outcomes
Development	Children's Aid Society Parent Leadership Institute (CAS PLI)	0.060	Null	1
Validation	New Leaders' Aspiring Principals Program	0.057	Positive	1
Development	Education Connections (EdConx)	0.050	Null	1
Development	Middle-Grades Leadership Development (MLD) Project	0.045	Null	1
Validation	Alaska Statewide Mentor Project (ASMP) Urban Growth Opportunity (UGO) Program	0.044	Positive	5
Validation	The English Language and Literacy Acquisition-Validation Program (ELLA-V)	0.040	Positive	12
Development	Unconditional Education	0.038	Null	1
Development	Accelerating Academic Achievement in Appalachian Kentucky (A4KY)	0.035	Null	1
Development	Florida Master Teacher Initiative (FMTI)	0.033	Null	3
Development	Exceptional Coaching for Early Language and Literacy (ExCELL)	0.029	Null	4
Validation	Literacy Design Collaborative (LDC)	0.028	Null	4
Development	Arts Achieve: Impacting Student Success in the Arts	0.026	Null	2
Validation	Literacy-Infused Science Using Technology Innovation Opportunity (LISTO)	0.025	Null	2
Development	PTA Comunitario	0.011	Null	2
Validation	Building Assets Reducing Risks (BARR)	0.009	Null	1
Scale-up	Children's Literacy Initiative (CLI)	0.007	Null	4
Validation	National Institute for School Leadership’s Executive Development Program	0.007	Null	1
Development	Around the Corner	0.004	Negative	10
Development	Write Up!	0.003	Null	4
Validation	Collaborative Strategic Reading (CSR)	0.001	Null	6
Validation	Teacher Potential Project	-0.002	Null	2
Validation	enhancing Missouri's Instructional Networked Teaching Strategies (eMINTS)	-0.022	Null	3
Development	Realizing Instructional Supports for English Language Learners (Project RISE)	-0.030	Null	2
Development	The Achievement Network (ANet)	-0.038	Negative	5
Validation	Families and Schools Together	-0.059	Null	6
Development	Schools to Watch (STW): School Transformation Network Project	-0.059	Null	1
Development	Rio Grande Valley Center for Teaching and Leading Excellence: New Teacher Training (NTT)	-0.083	Null	2

Grant Type	Name of Educational Strategy	Average Effect Size	Effect on English Language Arts	Number of Outcomes
Development	PreK - 12 Pathway to Teaching Academies	-0.107	Null	2
Development	New England Network for Personalization and Performance (NETWORK)	-0.120	Null	1
Development	Collaboration and Reflection to Enhance Atlanta Teacher Effectiveness (CREATE)	-0.121	Null	1
Development	Ounce of Prevention Fund (the Ounce) Professional Development Initiative (PDI)	-0.124	Null	1
Development	Targeted Intensive School Support Program (TISS)	-0.127	Null	1
Development	Boston Teacher Residency (BTR)	-0.127	Negative	2
Validation	Reading Apprenticeship (RA)	NA[a]	Null	1

[a] The official WWC review did not report an effect size for this educational strategy's English language arts outcome.
Sample size: 59 evaluations that WWC standards for one or more student outcomes in English language arts, according to an official 3.0 or 4.0 rating from the WWC or an unofficial 3.0 or 4.0 rating from the i3 study team.
Source: i3 grant evaluation reports

Exhibit C.12b: Average Magnitude of Effects on Student Performance in Mathematics for All Findings That Met WWC Standards

Grant Type	Name of Educational Strategy	Average Effect Size	Effect on Mathematics	Number of Outcomes
Validation	Higher Achievement	0.395	Positive	2
Validation	Pre-K Mathematics	0.392	Positive	3
Development	G2ROW STEM	0.291	Positive	2
Development	System for Educator Effectiveness Development (SEED)	0.252	Null	3
Development	Engineering STEM Identity (ESI)	0.232	Null	3
Development	Leading with Learning	0.231	Null	1
Scale-up	KIPP	0.227	Positive	15
Development	Unconditional Education	0.224	Positive	1
Development	Learning by Making	0.178	Null	1
Validation	New Teacher Center Induction Model	0.155	Positive	1
Validation	Alaska Statewide Mentor Project (ASMP) Urban Growth Opportunity (UGO) Program	0.154	Positive	8
Development	Accomplished Teaching, Learning, and Schools (ATLAS)	0.150	Null	1
Development	Realizing Instructional Supports for English Language Learners (Project RISE)	0.135	Null	2

Grant Type	Name of Educational Strategy	Average Effect Size	Effect on Mathematics	Number of Outcomes
Validation	StartSmart K-3 Plus Program	0.117	Positive	2
Validation	New Leaders' Aspiring Principals Program	0.089	Positive	1
Validation	enhancing Missouri's Instructional Networked Teaching Strategies (eMINTS)	0.082	Positive	3
Development	InnovateNYC Ecosystem	0.066	Null	4
Development	New England Network for Personalization and Performance (NETWORK)	0.062	Null	1
Scale-up	Teach for America (TFA)	0.055	Null	6
Development	Everyday Arts for Special Education (EASE)	0.052	Null	1
Development	STEM Summer Learning with VEX Robotics	0.033	Null	2
Development	Citizen Schools Expanded Learning Time (ELT)	0.031	Null	1
Development	Texas Tech University “Tech Teach” Program	0.029	Positive	2
Validation	GO College (An Enhanced Version of Talent Search)	0.023	Null	3
Validation	National Institute for School Leadership’s Executive Development Program	0.011	Null	1
Validation	Building Assets Reducing Risks (BARR)	0.009	Null	1
Development	School of One	0.006	Null	2
Development	Turnaround with Increased Learning Time	0.004	Mixed	3
Validation	Child-Parent Center Education Program	0.002	Null	1
Development	Middle-Grades Leadership Development (MLD) Project	-0.001	Null	1
Development	PTA Comunitario	-0.007	Null	2
Development	Accelerating Academic Achievement in Appalachian Kentucky (A4KY)	-0.008	Null	1
Scale-up	PowerTeaching	-0.018	Null	12
Development	Data-Based Individualization (DBI)	-0.019	Null	2
Development	Boston Teacher Residency (BTR)	-0.022	Null	2
Development	Innovations in Early Mathematics	-0.030	Null	2
Development	The Achievement Network (ANet)	-0.044	Negative	5
Validation	SunBay Digital Mathematics	-0.045	Null	1
Development	Rural Math Innovation Network (RMIN)	-0.052	Null	2
Development	Targeted Intensive School Support Program (TISS)	-0.070	Null	1
Development	Teach to One: Math (TtO)	-0.077	Null	1
Development	STEM Learning Opportunities Providing Equity (SLOPE)	-0.084	Null	1
Development	Florida Master Teacher Initiative (FMTI)	-0.086	Null	3

Grant Type	Name of Educational Strategy	Average Effect Size	Effect on Mathematics	Number of Outcomes
Validation	Accessing Algebra Through Inquiry (a2i)	-0.100	Null	2
Validation	Families and Schools Together	-0.124	Null	3
Development	Schools to Watch (STW): School Transformation Network Project	-0.145	Null	1
Development	PreK - 12 Pathway to Teaching Academies	-0.176	Null	2
Development	Infusing Innovative STEM Practices Into Rigorous Education (INSPIRE)	-0.182	Null	2
Development	Rio Grande Valley Center for Teaching and Leading Excellence: New Teacher Training (NTT)	-0.188	Null	2
Development	Children's Aid Society Parent Leadership Institute (CAS PLI)	-0.190	Null	1
Development	Rural Math Excellence Partnership (RMEP)	-0.570	Null	2

Sample size: 51 evaluations that WWC standards for one or more student outcomes in mathematics, according to an official 3.0 or 4.0 rating from the WWC or an unofficial 3.0 or 4.0 rating from the i3 study team.
Source: i3 grant evaluation reports

Exhibit C.12c: Average Magnitude of Effects on Student Performance in Science for All Findings That Met WWC Standards

Grant Type	Name of Educational Strategy	Average Effect Size	Effect on Science	Number of Outcomes
Development	Learning by Making	0.380	Positive	1
Validation	Advanced ASSET Professional Development	0.370	Null	2
Scale-up	KIPP	0.331	Positive	4
Development	G2ROW STEM	0.319	Positive	1
Development	Physical Science and Engineering Invention Kit Curriculum for Middle School	0.274	Null	1
Validation	Higher Achievement	0.170	Positive	1
Development	STEM Education for the 21st Century (STEM21)	0.151	Positive	2
Development	Engineering STEM Identity (ESI)	0.136	Null	3
Validation	The English Language and Literacy Acquisition-Validation Program (ELLA-V)	0.131	Null	2
Development	Mission HydroSci (MHS)	0.116	Positive	2
Development	AP Insight	0.066	Null	8
Validation	Leadership Assistance for Science Education Reform (LASER) Model	0.046	Null	24
Development	Infusing Innovative STEM Practices Into Rigorous Education (INSPIRE)	0.030	Null	1
Development	Enhanced Units (EU)	0.010	Null	1

Grant Type	Name of Educational Strategy	Average Effect Size	Effect on Science	Number of Outcomes
Validation	Making Sense of SCIENCE	0.004	Null	5
Development	Pathways to STEM Initiative (PSI)	-0.005	Null	3
Development	Turnaround with Increased Learning Time	-0.036	Null	3
Development	Enriching Education Through Dynamic Simulation and Technology (Engi Learn)	-0.059	Null	1
Validation	Literacy-Infused Science Using Technology Innovation Opportunity (LISTO)	-0.070	Negative	6
Validation	Virginia Initiative for Science Teaching and Achievement (VISTA)	-0.073	Null	5
Development	Accomplished Teaching, Learning, and Schools (ATLAS)	-0.470	Null	1

Sample size: 21 evaluations that WWC standards for one or more student outcomes in science, according to an official 3.0 or 4.0 rating from the WWC or an unofficial 3.0 or 4.0 rating from the i3 study team.
Source: i3 grant evaluation reports

Exhibit C.12d: Average Magnitude of Effects on Student School Attendance, Progress, or Attainment for All Findings That Met WWC Standards

Grant Type	Name of Educational Strategy	Average Effect Size	Effect on School Attendance, Progress, or Attainment	Number of Outcomes
Development	Uplifting Non-cognitive Skills and Innovation through Student Opportunity Networks (UNISON)	2.180	Positive	1
Validation	College Readiness Program (CRP), formerly Advanced Placement Training and Incentive Program (APTIP)	0.885	Positive	1
Development	Facilitating Long-Term Improvements in Graduation and Higher Education for Tomorrow (FLIGHT)	0.614	Positive	2
Development	Building Assets, Reducing Risks Model (BARR)	0.285	Positive	2
Scale-up	KIPP	0.260	Positive	2
Development	Linked Learning	0.210	Positive	3
Validation	Building Assets Reducing Risks (BARR)	0.194	Positive	1
Validation	STEM Early College Expansion Project (SECEP)	0.181	Positive	9
Validation	College and Career Readiness Expansion (CCRE) Project	0.144	Positive	3
Validation	Northeast Tennessee College and Career Ready Consortium	0.115	Positive	2

Grant Type	Name of Educational Strategy	Average Effect Size	Effect on School Attendance, Progress, or Attainment	Number of Outcomes
Validation	GO College (An Enhanced Version of Talent Search)	0.089	Null	5
Validation	Diplomas Now	0.035	Null	2
Validation	Early College Expansion Partnership	0.017	Positive	7
Validation	National Institute for School Leadership's Executive Development Program	0.014	Null	1
Development	Realizing Instructional Supports for English Language Learners (Project RISE)	-0.052	Null	5
Development	New England Network for Personalization and Performance (NETWORK)	-0.089	Null	3
Development	Unconditional Education	-0.181	Negative	1
Development	Accelerating Academic Achievement in Appalachian Kentucky (A4KY)	-0.198	Negative	3
Scale-up	The National Math and Science Initiative's College Readiness Program (CRP)	-0.252	Null	1
Development	New Tech Network	-1.181	Null	9

Sample size: 20 evaluations that WWC standards for one or more student outcomes in school attendance, progress, or attainment, according to an official 3.0 or 4.0 rating from the WWC or an unofficial 3.0 or 4.0 rating from the i3 study team.
Source: i3 grant evaluation reports

Exhibit C.12e: Average Magnitude of Effects on Student Academic Readiness, Knowledge, or Skill for All Findings That Met WWC Standards

Grant Type	Name of Educational Strategy	Average Effect Size	Effect on Academic Readiness, Knowledge, or Skill	Number of Outcomes
Development	Building Assets, Reducing Risks Model (BARR)	0.284	Positive	7
Validation	Collaborative Regional Education (CORE) Model	0.225	Null	1
Development	Accelerating Academic Achievement in Appalachian Kentucky (A4KY)	0.211	Positive	2
Validation	Higher Achievement	0.200	Positive	1
Development	Enhanced Units (EU)	0.137	Null	1
Validation	Building Assets Reducing Risks (BARR)	0.100	Positive	1
Development	Arts Achieve: Impacting Student Success in the Arts	0.095	Null	1
Validation	Child-Parent Center Education Program	0.080	Null	1
Validation	GO College (An Enhanced Version of Talent Search)	0.045	Null	1

Grant Type	Name of Educational Strategy	Average Effect Size	Effect on Academic Readiness, Knowledge, or Skill	Number of Outcomes
Validation	TNTP Teaching Fellows	0.017	Null	1
Development	12 for Life	0.015	Null	1
Validation	Northeast Tennessee College and Career Ready Consortium	-0.007	Null	3
Development	Pathways to Success	-0.010	Null	2
Validation	Collaborative Regional Education (CORE) Model	-0.015	Null	4
Development	Ounce of Prevention Fund (the Ounce) Professional Development Initiative (PDI)	-0.024	Null	2
Development	EngageMe P.L.E.A.S.E.	-0.031	Null	2
Development	Facilitating Long-Term Improvements in Graduation and Higher Education for Tomorrow (FLIGHT)	-0.053	Null	1
Development	Collaboration and Reflection to Enhance Atlanta Teacher Effectiveness (CREATE)	-0.139	Null	1
Development	New Tech Network	-0.184	Null	3

Sample size: 19 evaluations that WWC standards for one or more student outcomes in academic readiness, knowledge, or skill in content areas other than English language arts, mathematics, science, or social studies, according to an official 3.0 or 4.0 rating from the WWC or an unofficial 3.0 or 4.0 rating from the i3 study team.
Source: i3 grant evaluation reports

Exhibit C.12f: Average Magnitude of Effects on Student Performance in Social Studies for All Findings That Met WWC Standards

Grant Type	Name of Educational Strategy	Average Effect Size	Effect on Social Studies	Number of Outcomes
Development	Enhanced Units (EU)	0.332	Positive	1
Scale-up	KIPP	0.192	Positive	4
Validation	Higher Achievement	0.120	Null	1
Development	Rio Grande Valley Center for Teaching and Leading Excellence: New Teacher Training (NTT)	-0.120	Null	1

Sample size: 4 evaluations that WWC standards for one or more student outcomes in social studies, according to an official 3.0 or 4.0 rating from the WWC or an unofficial 3.0 or 4.0 rating from the i3 study team.
Source: i3 grant evaluation reports

Exhibit C.12g: Average Magnitude of Effects on Student Social-Emotional Learning and Behavior for All Findings That Met WWC Standards

Grant Type	Name of Educational Strategy	Average Effect Size	Effect on Social-Emotional Learning and Behavior	Number of Outcomes
Validation	Collaborative Regional Education (CORE) Model	0.213	Positive	1
Development	Targeted Intensive School Support Program (TISS)	0.131	Positive	1
Development	Guiding and Engaging Exceptional Teens (Get the Picture?!)	0.118	Null	1
Validation	The English Language and Literacy Acquisition-Validation Program (ELLA-V)	0.095	Null	2
Development	Enhanced Positive School Climate Model	0.034	Null	6
Validation	Families and Schools Together	0.024	Null	2
Development	Playground Physics	0.013	Null	2
Development	Pathways to Success	0.003	Null	3
Development	Unconditional Education	0.000	Null	1
Development	Enriching Education Through Dynamic Simulation and Technology (Engi Learn)	-0.039	Null	1

Sample size: 10 evaluations that WWC standards for one or more student outcomes in social-emotional learning and behavior according to an official 3.0 or 4.0 rating from the WWC or an unofficial 3.0 or 4.0 rating from the i3 study team.
Source: i3 grant evaluation reports

Exhibit C.12h: Average Magnitude of Effects on Teacher Outcomes for All Findings That Met WWC Standards

Grant Type	Name of Educational Strategy	Average Effect Size	Effect on Teacher Outcomes	Number of Outcomes
Development	Ounce of Prevention Fund (the Ounce) Professional Development Initiative (PDI)	0.840	Null	3
Validation	Children's Literacy Initiative (CLI) Program	0.600	Positive	2
Validation	Literacy-Infused Science Using Technology Innovation Opportunity (LISTO)	0.217	Positive	3
Validation	New Teacher Center Induction Model	0.120	Null	7
Scale-up	Children's Literacy Initiative (CLI)	0.112	Null	1
Validation	Alaska Statewide Mentor Project (ASMP) Urban Growth Opportunity (UGO) Program	-0.022	Null	10
Development	Education Connections (EdConx)	-0.053	Null	1
Development	Engineering STEM Identity (ESI)	-0.075	Null	1
Development	Collaboration and Reflection to Enhance Atlanta Teacher Effectiveness (CREATE)	-0.435	Null	2

Sample size: 9 evaluations that WWC standards for one or more teacher outcomes according to an official 3.0 or 4.0 rating from the WWC or an unofficial 3.0 or 4.0 rating from the i3 study team.
Source: i3 grant evaluation reports

C.4 Exploratory Analyses

Looking beyond the study's three guiding research questions, the study team conducted several additional exploratory analyses. One set of analyses looked at the question of whether the effects of i3 grant strategies on student academic outcomes were related to the overall grant objective or the educational level of students targeted by the educational strategies. A second analysis looked at the question of whether the effects of i3 grant strategies on student academic outcomes were related to the level of fidelity of implementation achieved by the grant in the impact study sites. A third set of analyses looked at the question of whether the extent to which the i3 grants met the expectations of the i3 Fund in fact led to the Fund achieving its overall goals. These analyses examined the relationships between the i3 Fund meeting its goals and (a) the extent to which i3 grantees successfully moved up the Department's tiered structure for evidence building; and (b) the extent to which the Department's efforts to increase the rigor of Development grant applicants' proposed evaluation designs was associated with more rigorous applicant designs. A fourth analysis explored the relationship between the evaluation technical assistance provided to the independent evaluators and the strength of Development grantee final study designs. A fifth and final analysis looked at the question of whether educational strategies with particular types of key components or objectives produced a higher share of positive effects on student outcomes than other strategies.

C.4.1 Effects of i3 Grant Strategies on Student Outcomes by Grant Characteristics

The i3 study team examined the effects of the educational strategies on student academic performance by certain grant characteristics and found no relationship. These analyses looked at two key features of the i3 grants that were potentially related to the effects on student outcomes: overall grant objectives and targeted educational levels for the strategies. Neither grant characteristic was significantly related to the effectiveness of the educational strategies.

Exhibit C.13: Effects of i3 Grant Strategies on Student Academic Outcomes, by Grant Objective

Objective	Total Number of Grants	No Student Outcome Met WWC Standards	Negative		Null		Mixed		Positive	
		Number	Number	Average Effect Size	Number	Average Effect Size	Number	Average Effect Size	Number	Average Effect Size
Improved classroom curriculum and instruction	53	6	2	-0.021	27	0.032	0	--	18	0.193
School turnaround/reform	38	12	1	-0.041	18	-0.072	1	0.064	6	0.201
Improved college readiness/access	25	9	0	--	8	-0.005	1	-0.021	7	0.268
Development of effective teachers and leaders	17	5	1	-0.075	6	-0.027	0	--	5	0.069
Enhanced family engagement with school	9	6	0	--	3	-0.041	0	--	0	--
Improved school climate and supports for students	6	0	0	--	2	0.016	1	0.020	3	0.847
All Grants	**148**	**38**	**4**	**-0.040**	**64**	**-0.011**	**3**	**0.021**	**39**	**0.242**

Note: One Validation grant with null findings and objective "Improved classroom curriculum and instructions" is included under "No student outcome met WWC standards" because the evaluation did not report sufficient information to calculate an effect size. Differences by objective in the effects of i3-funded strategies on student outcomes were not statistically significant at the .05 level ($p = 0.525$) according to a chi-squared test.
Sample size: All grants in the study: 148. Development grants: 99. Validation grants: 40. Scale-up grants: 9.
Source: Structured data from grantee evaluators and i3 grant evaluation reports.

Exhibit C.14: Effects of i3 Grant Strategies on Student Academic Outcomes, by Targeted Educational Level

Targeted Educational Level	Total Number of Grants	No Student Outcome Met WWC Standards	Negative		Null		Mixed		Positive	
		Number	Number	Average Effect Size	Number	Average Effect Size	Number	Average Effect Size	Number	Average Effect Size
Elementary grades	40	11	2	-0.021	16	0.053	0	--	11	0.222
Elementary and middle grades	9	4	1	-0.041	3	-0.050	0	--	1	0.216
Middle grades	19	1	0	--	14	0.018	1	0.064	3	0.149
Middle and high school grades	20	5	0	--	9	-0.058	1	-0.021	5	0.177
High school grades	30	7	0	--	10	-0.099	0	--	13	0.370
K-12	30	10	1	-0.075	12	-0.012	1	0.020	6	0.108
All Grants	**148**	**38**	**4**	**-0.040**	**64**	**-0.011**	**3**	**0.021**	**39**	**0.242**

Note: One Validation grant with null findings that targeted high school grades is included under "No student outcome met WWC standards" because the evaluation did not report sufficient information to calculate an effect size. Differences by targeted educational level in the effects of i3-funded strategies on student outcomes were not statistically significant at the .05 level, according to a chi-squared test.
Sample size: All grants in the study: 148. Development grants: 99. Validation grants: 40. Scale-up grants: 9.
Source: Structured data from grantee evaluators and i3 grant evaluation reports.

C.4.2 Effects of i3 Grant Strategies on Student Outcomes by Fidelity of Implementation of Key Components of the Strategies

The study team examined the effects of the educational strategies on student academic performance by the level of fidelity of the implementation of the key components and again found no relationship. Note that the version of fidelity that i3 grantees were expected to measure targeted the delivery of the key components of the educational strategies, such as professional development, coaching, or new curricula. This contrasts with fidelity of implementation in terms of the behaviors of teachers and other staff and students in classrooms, schools, or communities hypothesized to lead to improvements in student success.

Exhibit C.15: Effects of i3 Grant Strategies on Student Academic Outcomes, by Fidelity

	Total Number of Grants	No Student Outcome Met WWC Standards	Negative		Null		Mixed		Positive	
		Number	Number	Average Effect Size	Number	Average Effect Size	Number	Average Effect Size	Number	Average Effect Size
Grants with high-quality fidelity measure reporting "Adequate Fidelity of Implementation of Key Components"	101	24	2	-0.035	43	-0.018	2	0.00	30	0.246
Grants with high-quality fidelity measure reporting "Below Adequate Fidelity of Implementation of Key Components"	37	10	1	-0.041	17	0.023	1	0.064	8	0.242
Grants without high quality fidelity measure	10	4	1	-0.046	4	-0.082	0	--	1	0.130
All Grants	**148**	**38**	**4**	**-0.040**	**64**	**-0.011**	**3**	**0.021**	**39**	**0.242**

Note: One Validation grant with null findings and adequate fidelity of implementation is included under "No student outcome met WWC standards" because the evaluation did not report sufficient information to calculate an effect size. Differences by fidelity of implementation in the effects of i3-funded strategies on student outcomes were not statistically significant at the .05 level, according to a chi-squared test.
Sample size: All grants in the study: 148. Development grants: 99. Validation grants: 40. Scale-up grants: 9.
Source: i3 grant evaluation reports

C.4.3 Tiered Structure for Evidence Building

The tiered evidence structure of the i3 Fund program not only allowed grantees to apply for funding that matched the level of prior evidence for their strategies, it also provided a pipeline so that lower tier grants with strategies that were effective at improving student outcomes could apply for higher tier grants, with larger award amounts, to continue to build evidence for the effectiveness of the strategy at a broader scale. This tiered structure is consistent with the ultimate goal of the i3 program, namely, to identify strategies that are effective at scale (see Looking Ahead in the report).

Exhibit C.16: i3 Grantees with Subsequent i3 and EIR Grant Awards at Higher Tiers of Evidence

Subsequent i3 and EIR Grant Awards	Development			Validation			Total		
	Number of Grants with Subsequent Award	Total Number of Grants with Positive Finding	Percent of Grant Type	Number of Grants with Subsequent Award	Total Number of Grants with Positive Finding	Percent of Grant Type	Number of Grants with Subsequent Award	Total Number of Grants with Positive Finding	Percent of Grant Type
Validation (i3) or Mid-phase (EIR) Grants	4	15	27	NA	NA	NA	4	15	27
Scale-up (i3) or Expansion (EIR) Grants	3	15	20	6	19	32	9	34	26
Total	**7**	**15**	**47**	**6**	**19**	**32**	**13**	**34**	**38**

Sample size: The 15 Development and 19 Validation grants in the study that had positive findings for student academic and social-emotional outcomes.

Sources: Office of Elementary and Secondary Education, U.S. Department of Education, Education and Innovation Research Awards, https://oese.ed.gov/offices/office-of-discretionary-grants-support-services/innovation-early-learning/education-innovation-and-research-eir/awards/ and Investing in Innovation (i3) Awards, https://oese.ed.gov/offices/office-of-discretionary-grants-support-services/innovation-early-learning/investing-in-innovation-i3/awards/

C.4.4 Changes Across Cohorts in Strength of Evidence of Development Grantee Evaluations

To improve the quality of the i3 Development grantee evaluations, starting with the 2015 grant competition the Department incentivized Development grant applicants to propose evaluations with sufficient rigor to meet WWC standards with reservations. To explore the relationship of this incentive and the strength of proposed Development grant applicants' evaluation designs, the i3 study team assessed the proposed evaluation designs on their potential to meet WWC standards with or without reservations. The study team conducted a chi-squared test comparing the percentage of development grants with designs having the potential to meet WWC standards across the seven cohorts of grants and for the five cohorts of grantees before 2015 versus the 2015 and 2016 cohorts combined. There was a statistically significant increase across cohorts in the share of Development grant applicants whose evaluations had the potential to meet WWC standards, and another statistically significant difference between the cohorts before and after the change in the i3 expectations for strength of proposed evaluation design.

Exhibit C.17: Strength of Evidence of Evaluation Designs Proposed by i3 Development Grantees in their Applications, by Cohort: Number and Percent of Grants

Cohort	Number of Funded Development Grants	Potential Strength of Evidence of Effectiveness Design Proposed in Grant Application			
		Would Not Meet WWC Standards as Proposed		Potential to Meet WWC Group Design Standards with Reservations or without Reservations	
		Number	Percent	Number	Percent
2010	30	11	37	19	63
2011	17	2	12	15	88
2012	12	5	42	7	58
2013	18	1	6	17	94
2014	21	2	10	19	90
2015	7	0	0	7	100
2016	10	0	0	10	100
All cohorts	**115**	**21**	**18**	**94**	**82**

Note: Differences across cohorts in the percent of Development grants with the potential to meet WWC standards were statistically significant at the 0.05 level, according to a chi-squared test (p = 0.035). Differences between the share of Development grants with the potential to meet WWC standards from 2010-2014 and the share of those grants in 2015 and 2016 were statistically significant at the 0.05 level according to a chi-squared test (p = .003)
Sample size: 115 Development grants.
Source: Department i3 Fund program records

C.4.5 Changes in Strength of Evidence in Development Grantee Evaluations from Application to Final Design

The evaluation technical assistance provided to i3 grantees was intended to ensure that the effectiveness studies were as rigorous as possible and had the potential to meet WWC evidence standards. In the grantee applications, a design was proposed for examining the effectiveness of the educational strategies. Among Development grants, only some of the designs in the applications had the potential to meet WW evidence standards. In the first year of the grant period, all grantees completed a revised evaluation design, after working closely with the technical assistance team. Among Development grants, across the seven cohorts, 21 grants proposed studies in their applications that did not have the potential to meet WWC evidence standards. For their final revised designs, only 7 grants still proposed designs that could not meet standards. The evaluation TA may have been an important factor in the increased rigor of the evaluation designs.

Exhibit C.18: Strength of Evidence of Development Grantee Evaluation Designs from i3 Grant Application to Final Design

Cohort	Number of Grants with Application Designs Whose Potential Strength of Evidence Would Not Meet WWC Standards	Number of Grants with Final Study Designs Whose Potential Strength of Evidence Would Meet WWC Standards
2010	11	9
2011	2	2
2012	5	2
2013	1	0
2014	2	1
2015	0	NA
2016	0	NA
All cohorts	**21**	**14**

Sample size: 115 Development grants awarded by the i3 program.
Sources: Department i3 Fund program records and structured data from grantee evaluators.

C.4.6 Relationship of i3 Grantee Educational Strategies and Effects on Student Outcomes

To understand whether strategies with particular characteristics implemented by i3 grants were more likely than those with other characteristics to produce positive effects on student outcomes, the i3 study team used statistical regression analyses to look for evidence of any relationship between various characteristics and positive findings. These analyses used three different regression analyses. Each analysis model included the educational level targeted by the i3 grant strategy, but the models differed with respect to which other characteristics they included (top panel of Exhibit C.19). These characteristics included the grant objective, types of key components, mediators and targeted short-term non-academic outcomes in grantee logic models, and the targeted student outcomes. The bottom panel of Exhibit C.19 shows the likelihood ratio test which indicates whether knowing the values of the characteristics included in the model improves the accuracy with which we can predict that a strategy will improve student outcomes. In this bottom panel, none of the three regression models yielded evidence of a statistically significant relationship between the characteristics of grantee educational strategies and positive findings.

With 148 evidence strategies that vary widely across measured characteristics, it is perhaps unsurprising that the likelihood ratio test is not significant. There are more than 28 million possible combinations of objective (six possible values), key components (11 indicators, not mutually exclusive), targeted educational level (six possible values), mediators (three indicators, not mutually exclusive), targeted short-term non-academic outcomes (three indicators, not mutually exclusive), and targeted student outcome (six possible values). Not

detecting evidence of a relationship between these characteristics and positive findings does not mean that such a relationship does not exist. Detecting such a relationship might require a much larger sample of strategies.

The likelihood ratio test results indicate that the estimated coefficients, which describe the relationship between each characteristic in the model and positive effects on student outcomes, are suspect. If the model as a whole does not improve the accuracy with which we can predict that a strategy will improve student outcomes, then the estimates generated by that model cannot offer insight into what kind of strategies improve student outcomes. Statistically significant coefficients are likely due to the multiple comparison problem described in section B.5.5. The presentation of analysis results therefore omits the full analysis results from the model.

Exhibit C.19: Results of Regression Models Exploring Potential Relationships Between Characteristics of i3 Grantee Educational Strategies and Effects on Student Outcomes

	Model 1	Model 2	Model 3
Covariates			
Objective	●	●	
Key components	●	●	
Targeted educational level	●	●	●
Mediators	●		●
Targeted short-term non-academic outcomes	●		●
Targeted student outcome	●		●
Likelihood Ratio Test of Model Fit			
Chi-squared	34.32	28.35	13.82
Degrees of Freedom	30	20	13
p-value	0.27	0.10	0.39

Sample size: Grants in the study sample: 148.
Source: i3 grant evaluation reports

ENDNOTES

[1] Consolidated Appropriations Act, 2010, Section 307, Division D, (Public Law 111-117)

[2] Projects were allowed to serve early learners (infants, toddlers, or preschoolers) so long as project services were extended into kindergarten or later years. Projects were also allowed to serve postsecondary students so long as project services were provided to these students during the secondary grades or earlier.

[3] For the first three cohorts of the grant competition, 2010 through 2012, the Department required applicants for Development grants to provide a "reasonable hypothesis" for the proposed strategy rather than "evidence of promise or strong theory" required in subsequent years. A reasonable hypothesis was defined as (1) Evidence that the proposed strategy, or one similar to it, has been attempted previously, albeit on a limited scale or in a limited setting, and yielded promising results that suggest that more formal and systematic study is warranted; or (2) a rationale for the proposed strategy that is based on research findings or reasonable hypotheses, including related research or theories in education and other sectors.

[4] For the first three cohorts of the grant competition, 2010 through 2012, the Department required applicants for Development grants to provide a "reasonable hypothesis" for the proposed strategy rather than "evidence of promise or strong theory" required in subsequent years. A reasonable hypothesis was defined as (1) Evidence that the proposed strategy, or one similar to it, has been attempted previously, albeit on a limited scale or in a limited setting, and yielded promising results that suggest that more formal and systematic study is warranted; or (2) a rationale for the proposed strategy that is based on research findings or reasonable hypotheses, including related research or theories in education and other sectors.

[5] The What Works Clearinghouse (WWC), an initiative of the U.S. Department of Education's Institute of Education Sciences (IES) created in 2002, reviews research on education programs, products, practices, and policies to identify high-quality studies and summarize findings about what works in education. To this end, the WWC establishes standards and procedures to distinguish weaker studies from those that are well-designed and well-conducted. The latter kinds of studies provide credible evidence that any effects found resulted from the strategies tested rather than from other potential sources.

[6] Independent evaluation means that the evaluation is designed and carried out independent of, but in coordination with, any employees of the entities who develop a process, product, strategy, or practice and are implementing it. See: Final Priorities, Requirements, Definitions, and Selection Criteria—Investing in Innovation Fund; Applications for New Awards; Investing in Innovation Fund, Development Grants; Rule and Notice, 78 Fed. Reg. 18704 (March 27, 2013)

[7] In August 2021, the first six cohorts of i3 grants had completed the five-year grant period and the last cohort of grants (FY 2016) were in the last quarter of their five-year grant period.

[8] See, for example, the U.S. Department of Education (2010, March 12). Office of Innovation and Improvement; Overview Information: Investing in Innovation Fund; Notice Inviting Applications for New Awards for Fiscal Year (FY) 2010, Federal Register, 75(48). https://www.govinfo.gov/content/pkg/FR-2010-03-12/pdf/2010-5139.pdf

[9] The What Works Clearinghouse (WWC), an initiative of the U.S. Department of Education's Institute of Education Sciences (IES) created in 2002, reviews research on education programs, products, practices, and policies to identify high-quality studies and summarize findings about what works in education. To this end, the WWC establishes standards and procedures to distinguish weaker studies from those that are well-designed and well-conducted. The latter kinds of studies provide credible evidence that any effects found resulted from the strategies tested rather than from other potential sources.

[10] Version 3.0 of the WWC Standards and Procedures Handbook were in effect from March 2014 to September 2017. Version 4.0 of the WWC Standards and Procedures Handbook took effect in October 2017. Some reviews for i3 evaluations completed before May 2017, were conducted under evidence review protocols other than the RISP, including the Teacher Training, Evaluation, and Compensation, Beginning Reading, and the Transition to College Evidence review protocols available here: https://ies.ed.gov/ncee/wwc/Protocols

[11] Version 4.0 and 3.0 of the WWC Procedures and Standards Handbook are available at https://ies.ed.gov/ncee/wwc/Handbooks. The RISP is available at https://ies.ed.gov/ncee/wwc/Document/262

[12] The WWC's Data From Study Reviews is available here: https://ies.ed.gov/ncee/wwc/StudyFindings. Data used for this report were downloaded in June 2021. When these data included more than one official WWC review, the study team prioritized the review conducted under version 4.0 of the WWC Standards and the RISP, because the RISP includes guidance for the broadest set of findings.

[13] Unofficial reviews for i3 evaluations completed prior to May 2017 are available at https://ies.ed.gov/ncee/projects/evaluation/i3data_files.asp

[14] When an evaluator obtained data such as achievement test scores, student attendance, or grade point average that districts or states routinely collect, the data were considered to be independent, even if officials from the state or local education agency were part of the grant team.

[15] The selection criterion "Quality of the Project Evaluation" was worth up to 20 points in the FY 2015 and FY 2016 Development grant competitions. One of three factors under this selection criterion in those two competitions was "the extent to which the methods of evaluation will, if well-implemented, produce evidence about the project's effectiveness that would meet the What Works Clearinghouse Evidence standards with reservations."

[16] Not shown in Exhibits C.12a-C.12h are two other evaluations that met WWC standards for outcomes in two other content areas. One Development grantee's evaluation found that the Targeted Intensive School Support Program (TISS) strategy had a null effect on school leader outcomes (one outcome, effect size = 0.195). One Validation grantee's evaluation found that New Teacher Center Induction Model had a null effect on school environment outcomes (two outcomes, average effect size = -0.088).