

**Strengthening State Infrastructure for High-Impact Tutoring:
Scaling Evidence-Based Literacy Support Through Cognitive Science**

A. Significance	1
A.1 Overview	1
A.2 Evidence of Impact	3
A.3 Innovative Extension of Existing Evidence-Based Components	5
(B) Strategy to Scale	7
B.1. Unmet Demand for Broader Implementation	7
B.2. Management Plan	8
B.3. Core Strategic Partners	16
B.4. Plan to Deliver Project Services Efficiently and Effectively	18
B.5. Dissemination Plan	21
(C) Quality of the Project Design	23
C.1. Logic Model	23
C.2. Clearly Specified and Measurable Goals, Objectives, and Outcomes	25
(D) Quality of the Evaluation and other Evidence-Building	27
D.1. Evaluation Designed to Meet WWC Standards Without Reservations	27
D.2. Guidance on Effective Strategies Suitable for Replication or Testing	35
D.3. Fidelity of Implementation and Contextual Factors	37
D.4. Design for Information to Guide Replication	38
(F) References	40

A. Significance

A.1 Overview

Indiana has emerged as a national leader in literacy. The state has set ambitious goals aligned with the science of reading and enacted bold policies to achieve them. These efforts are already yielding measurable gains in student literacy outcomes. To sustain and accelerate this progress, the Indiana Department of Education (IDOE) is partnering with the University of Notre Dame (“Notre Dame”) and WestEd to apply for a Mid-Phase EIR grant under Absolute Priority 1 (Promoting Evidence-Based Literacy), with Competitive Preference Priorities 1 (Returning Education to the States) and 2 (Education Choice: High-Impact Tutoring). With this funding, Indiana will strengthen the human infrastructure that supports children’s literacy by expanding the number of caring individuals connected to schools (tutors, aides, and parents) who are trained in the science of reading. Rather than operating tutoring programs separately from schools, this initiative embeds university-based learning design teams to help schools build sustainable capacity for high-impact tutoring and evidence-based literacy support. It represents one critical component of Indiana’s broader statewide literacy strategy to improve early reading outcomes and move closer to the state’s goal of a 95% pass rate on IREAD.

Building on a successful South Bend model connecting tutors to cognitive science (Tutor-ND), IDOE will scale the Tutor Cognitive Science Connection Hub (Tutor-CogSci), a capacity-building model integrating high-impact tutoring with workforce development. Tutor-CogSci organizes college and high school students, aides, and other school-connected adults into interdisciplinary learning design teams embedded within elementary schools. It strengthens schools’ capacity to sustain effective literacy support while generating generalizable evidence for the field. Together, IDOE, Notre Dame, and WestEd will: (a) build the human infrastructure needed to meet Indiana’s reading goals at scale; (b) develop the youth-serving workforce, especially aspiring teachers, pediatricians, cognitive scientists, and parents; and (c)

ensure continuous improvement through data-driven, design-based implementation.

Indiana is uniquely positioned to tackle one of the most urgent challenges in education: ensuring that every student receives effective, relationship-focused literacy instruction tailored to individual needs. Tutor-CogSci has been refined and tested over four years in Indiana schools, producing gains in school readiness and reading achievement. Unlike outreach programs that deploy untrained “reading buddies” or “homework helpers,” Tutor-CogSci connects tutors directly to cognitive science, preparing them to support the full developmental literacy trajectory. Tutors deliver programs and practices that meet WWC’s evidence standards through iterative cycles of implementation, evaluation, and refinement. Tutors collaborate within design teams to propose, test, and improve literacy supports grounded in the science of reading. All team members gain experience with both research and practice, creating a reciprocal interface that improves student outcomes, strengthens the workforce, and advances scientific understanding.

When implemented with fidelity, high-impact tutoring produces one of the largest effect sizes in education (Fryer, 2017), yielding greater gains per dollar than preschool, direct cash transfers, or class-size reduction (Cook et al., 2014). Tutor-CogSci invests in human capacity through rigorous preparation and mentoring, avoiding the pitfalls of prior efforts that relied on underprepared tutors (Deke et al., 2012; Henrich et al., 2010). By aligning tutor training, materials, and implementation with the science, the state ensures that caring adults who work with children can deliver effective, evidence-based literacy support. University partnerships are central to this strategy. They supply well-trained, mission-aligned tutors (Makori et al., 2024) while advancing research and workforce development. Because Tutor-CogSci is embedded in a university infrastructure, it prioritizes formation, relationships, and learning outcomes rather than profit (Belsha, 2023). Through collaboration with universities and open sharing of materials and adaptations, the project will ensure fidelity, replicability, and scalable impact statewide.

If funded, this EIR project will position Indiana as a national model for how states can

partner with higher education and research institutions to align workforce development with school-based literacy support to achieve ambitious academic goals.

A.2 Evidence of Impact

Too many children are not thriving in school (President’s Executive Order on Expanding Educational Freedom and Opportunity for Families, 2025). That is true in South Bend, where only 53.7% of students in the South Bend Community School Corporation (SBCSC) passed Indiana’s third-grade reading assessment (IREAD) in 2021, compared to the statewide average of about 82%. SBCSC serves roughly 15,000 students, two-thirds of whom qualify for free or reduced-price lunch. When children are not reading proficiently by third grade, there are long-term costs for communities (ECF, 2023).

To address this challenge, Notre Dame and SBCSC launched Tutor-CogSci (locally called Tutor-ND) in 2021-22 to connect schools to cognitive science and accelerate literacy growth. Two pilot schools serving about 225 children in grades 2-4 participated. Tutors were trained and supported through university-based design teams working alongside school staff. A small group of school-selected students (N = 33) received high-impact tutoring 3-4 days per week during the school day for 20 weeks, while instructional aides and Title I paras joined training sessions and goal setting. Tutored students showed an average 65% gain in DIBELS Oral Reading Fluency (ORF), one of the most reliable predictors of later achievement (Fuchs et al., 2001; Bigozzi et al., 2017; Whitley, 2019). The broader school community also gained access to science-of-reading-aligned tools, assessments, and professional learning.

In 2022-23, the model expanded to nine SBCSC schools serving approximately 1,600 children in grades 2-4. Directly tutored students (~15 per school) achieved an average ORF gain of 87% and nearly double the growth expected from typical reading interventions. A prospective, matched comparison showed students matched on baseline demographics and fall scores performed significantly better on spring i-Ready assessments when supported by a

Tutor-CogSci-trained tutor ($p < .001$). In 2023-24, with AmeriCorps support, Tutor-CogSci added on-demand training, downloadable curriculum inserts, assessment guides, and an “Ask a Cognition Expert” service. These resources enabled expansion into Catholic schools, community centers, and new university partnerships with Boston College and the University of Dayton.

By 2024-25, Tutor-CogSci sustained high-impact tutoring across nine SBCSC schools during the school day, provided on-demand support for community-based and afterschool tutors, trained school staff to lead summer programs, and shared science-of-reading-aligned materials with families. SBCSC’s IREAD pass rate rose from 53.7% in 2021 to 70.8% in 2025—the largest gain among comparable public districts in the state. Schools supported by Tutor-CogSci increased IREAD pass by 26.4 percentage points, five times the state average over the same period. Partnering Catholic schools also posted remarkable results: St. Adalbert improved from 72% to 95.5%, Holy Cross from 83.3% to 97.4%, and St. Vincent DePaul from 88.9% to 100%.

These results unfolded alongside major state-led literacy reforms that created urgency and alignment for schools seeking evidence-based support. In 2022, the statewide Literacy Cadre began offering collaborative professional development for K-3 teachers. HEA 1558 (2023) codified the Science of Reading in state law, prohibited three-cueing as the basis of word recognition, required adoption of aligned curricula, and established new literacy endorsements for teachers. SB1, the Every Child Learns to Read Act (2024), strengthened early screening and remediation requirements for students not passing IREAD. These reforms heightened accountability and demand for evidence-based support such as Tutor-CogSci’s.

Indiana demonstrates how bold state literacy reforms can translate into measurable gains when paired with university-led capacity-building and workforce development—a model of how policy, research, and practice can work together to ensure that every child learns to read.

A.3 Innovative Extension of Existing Evidence-Based Components

Tutor-CogSci integrates three evidence-based components: (a) tutoring structured around “design principles for effective tutoring,” (b) use of evidence-based programs and practices aligned with the science of reading, and (c) a design-based implementation (Anderson & Shattuck, 2012; Brown, 1992; Bryk, 2009; Cobb et al., 2003; Penuel et al., 2011; The Design-Based Research Collective, 2003).

Design Principles for Effective Tutoring. Consistent with “what works” in tutoring (Nickow et al., 2020; Robinson et al., 2021), Tutor-CogSci emphasizes the following: (a) structured training and ongoing support; (b) instruction customized based on continuous progress monitoring; (c) low child-to-tutor ratios (ideally 1:1, max 3:1); (d) relationship-focused sessions delivered consistently during the school day; (e) high dosage (at least 3 times/week for 25-30 minutes/day); and (f) use of high-quality instructional materials. Tutoring models adhering to this structure reliably raise student literacy levels (e.g., Reading Corps, Markovitz et al., 2018).

Use of Evidence-Based Programs and Practices. These design principles define *how* tutoring is structured, but “high-quality instructional materials” can be subjective. Tutor-CogSci therefore aligns content with WWC Evidence Standards. Tutors study and implement WWC Practice Guide recommendations rated “strong” or “moderate” across the developmental literacy trajectory—from *Preparing Young Children for School* to *Foundational Skills to Support Reading for Understanding K-3* and *Providing Reading Interventions for Students in Grades 4-9*. To carry out these Practice Guide recommendations, tutors receive training on the developmental literacy trajectory (see Appendix [J.5](#)) and use supplemental reading programs aligned with each student’s assessed needs. Students are screened and grouped based on ORF and decoding data, and tutors implement the program most strongly supported for that need. For example, *Sound Partners* (grades K-3) provides explicit, systematic instruction in phonemic awareness, phonics, spelling, and reading fluency. It has one of the largest improvement indexes in WWC (e.g., Vadasy et al.,

2005). *Word Connections* (grades 3 and up) emphasizes multi-syllabic decoding and purposeful fluency building and has demonstrated significant gains in upper-elementary literacy achievement in a study meeting WWC Standards Without Reservations (Toste et al., 2019).

Innovative Design-Based Implementation. After matching children to the appropriate program, tutors engage in an ongoing cycle of (1) implementation, (2) analysis, and (3) redesign. Drawing from cognitive science and engineering (Anderson & Shattuck, 2012; Brown, 1992; Collins, 1992; Bryk, 2009), this process treats improvement as continuous adaptation: beginning with programs already supported by causal evidence and refining them for local reliability and fit. Tutor-CogSci provides both guardrails and flexibility because it grounds schools in evidence-based programs while enabling rapid, context-responsive adaptation.

For example, design teams supporting Sound Partners in SBCSC schools have introduced research-informed adaptations such as incorporating children’s interests, adding nonfiction texts tied to Indiana’s science standards, and including short math activities into the “custom” portion of sessions (see Appendix [G.2](#), [J.1](#), [J.2](#), and [J.3](#) for more details). In the 5-minute “custom” segment, tutors and students select from a curated set of program-aligned activities tied to Indiana Standards and student needs. This structure blends the rigor of research with the responsiveness of practice, fostering tutor leadership and professional growth while creating a built-in framework for testing innovations. Promising practices are examined systematically through A/B comparisons or rapid-cycle testing (Stone et al., 2018).

This bi-directional feedback loop ensures that research and practice continually inform one another. Design teams composed of scientists, educators, and tutors reflect evidence showing that collaboration across disciplines fosters buy-in, innovation, and sustainable solutions (NASEM, 2005; Penuel et al., 2011). The approach aligns with established principles of professional learning communities (Lakshmanan et al., 2011), promoting shared accountability and continuous improvement. As one tutor reflected, *“It is so much more collaborative than*

tutoring normally is. We have all these materials and resources at our disposal, mentors to answer our questions and troubleshoot, and peers to share our ideas with.” Tutor-CogSci extends high-impact tutoring by embedding it within a cognitive-science-informed, design-based improvement system ensuring what has worked somewhere can work reliably here and now.

(B) Strategy to Scale

B.1. Unmet Demand for Broader Implementation

As evidence of Tutor-CogSci’s success has spread, demand for participation has grown beyond current capacity. Schools and community partners have seen measurable literacy gains and are requesting expanded support. Every school in the original Tutor-ND network sought continued or increased services. Across Indiana, additional schools and community organizations have inquired about joining, including PK-8 Catholic schools, charter networks like Paramount and Success, and youth-serving organizations like the Boys & Girls Club.

Because resources are finite, Tutor-CogSci has prioritized high-need schools where IREAD pass rates are below average. To meet growing demand and build sustainable local capacity, Tutor-CogSci has progressively expanded the range of individuals who are trained and supported at the school. For example, tutors from St. Joseph High School work with students at their feeder school St. Joseph Grade School, while Washington High School students support children in the afterschool program at the Charles Black Community Center. School-based staff such as instructional aides, librarians, and the central office data team have all been trained to tutor in SBCSC. This innovation, which emerged directly from unmet demand, has multiplied impact by engaging a broader workforce and embedding expertise within schools themselves.

B.2. Management Plan

Overall Governance and Partnership Structure

The project’s management structure ensures timely, efficient, and accountable implementation of Tutor-CogSci. It clearly defines responsibilities, milestones, and

communication mechanisms across partners to achieve project goals on time and within budget. IDOE will serve as the lead applicant and fiscal agent for this project. It will provide overall oversight, accountability, and alignment with state literacy and workforce development priorities. IDOE also provides a path to sustainability via Work and Learn internships for aspiring educators and contracting models that reward impact. To reduce administrative burden, IDOE will contract with Notre Dame to manage day-to-day implementation, training, and coordination of the main hub, and with WestEd to conduct the independent, external evaluation. This structure preserves state leadership and fiscal oversight while leveraging nationally recognized expertise.

Notre Dame's Center for Educational Research and Action is the central coordinating entity for project management, shared data systems, and research-practice partnership convening. Tutor-ND manages tutor and design-team leader capacity-building, including recruitment, training, curriculum alignment with school's curriculum and the state's science-of-reading goals, progress monitoring, and ongoing professional learning through feedback cycles, workshops, and design team meetings. Tutor-ND also supports a network of regional design teams, each anchored in a collaborating university and paired with local schools. These university-school partnerships will function as "spokes" connected to the central Tutor-CogSci hub, ensuring consistency in implementation while allowing adaptation to local contexts.

WestEd operates under a separate evaluation contract, maintaining full independence in all research, analysis, and reporting functions. WestEd will establish its own data-sharing agreement with IDOE to access administrative and outcome data necessary for the evaluation. WestEd will have no role in program implementation, thereby preserving integrity of the independent evaluation. To strengthen transparency and reproducibility, Notre Dame's Center for Research on Educational Opportunity will conduct parallel analysis of de-identified data under its existing data-sharing agreement with IDOE. This arrangement allows for replication using distinct analytic files without compromising evaluator independence.

Organizational Roles and Responsibilities

IDOE. IDOE provides state-level leadership, fiscal management, policy alignment, and final approval of all training and curriculum materials. It ensures project activities support Indiana’s Science of Reading priorities and its broader achievement goals. IDOE executes contracts with Notre Dame and WestEd, identifies priority school partners, and facilitates coordination across complementary state initiatives such as the Indiana Learning Lab, the Literacy Cadre, and the EARN Internship Program. IDOE also convenes quarterly progress reviews to monitor performance and coordinate sustainability planning through its EARN Internship Program and contracting that prioritizes impact.

Notre Dame. Notre Dame directs day-to-day project operations under contract with IDOE. Through its Center for Educational Research and Action, Notre Dame manages personnel resources, maintains shared data systems for progress monitoring and continuous improvement, and oversees statewide tutor and design-team leader training. Tutor-ND serves as the main Tutor-CogSci hub responsible for standardized recruitment, training, curriculum and resource sharing, fidelity monitoring, and communications across learning design teams statewide. The Center for Research on Educational Opportunity supports data integration and transparency by conducting parallel replication analyses under its existing data sharing agreement with IDOE to strengthen reproducibility and trust.

WestEd. WestEd serves as the independent evaluator under a separate contract with IDOE. It designs and conducts the impact, implementation, and cost studies to meet WWC Standards Without Reservations. WestEd receives de-identified student-level IREAD and attendance data directly from IDOE’s Chief Information Officer, along with de-identified program implementation data from the Tutor-ND main hub linked to state outcomes through a secure data cleaning process and matching process managed by the Center for Research on Educational Opportunity under IDOE’s existing, approved data-sharing protocol. WestEd

maintains full independence in research design, data analysis, and reporting.

Regional Hubs. Selected university partners will serve as regional Tutor-CogSci hubs supporting multiple design teams within their geographic area. Each regional hub will be housed at a university selected through a structured RFA process in Year 1 (see Management Plan, B.2). Regional hubs will collaborate with Notre Dame to coordinate local tutor recruitment and training using the Tutor-ND established protocol and training materials, host convenings each semester, provide leadership for multiple design teams at affiliated schools, and help coordinate training for instructional aides, parents, and other community members. Regional hubs ensure fidelity to the model by using Tutor-ND provided materials and integrating all local design teams into the Tutor-ND tutor learning management system; submitting screening and progress-monitoring data (ORF and decoding scores), tutor closing tickets, and design-team meeting notes to the secure central database; and aligning local implementation with IDOE's literacy priorities. Regional hubs will serve as capacity-building support, helping schools extend the science of reading beyond teachers to ensure more of the caring individuals connected to the school (e.g., tutors, aides, parents) share a common understanding of effective literacy instruction and can reinforce it in their interactions with children.

Learning Design Teams. Each design team is led by a design-team leader and connected to a university-based cognitive science lab or course for aspiring educators. Teams typically include a mix of college students and high school interns, school-based staff (e.g., aides, reading specialists, administrative leaders, or teacher liaisons), and where appropriate, parents or community volunteers. The design-team leader coordinates tutor recruitment, progress monitoring, and local training activities, while facilitating day-to-day implementation in the school. Each regional hub includes Ph.D.-level faculty expertise in cognitive science and the science of reading to provide supervision and technical assistance to the design-team leaders. The university partner ensures that all teams remain connected to ongoing research, fidelity

standards, and data-informed improvement cycles. Design-team leaders monitor tutor “closing tickets” and provide weekly feedback to tutors. Design-team leaders meet at least three times per semester with high-impact tutors (during ~10-11 scheduled weeks of high-impact tutoring) to review data, address implementation challenges, and share insights. Design-team leaders, tutors, and all relevant school staff and volunteers are invited to hub-wide literacy convenings once per semester at the nearest partnering university.

School Districts and Community Partners. Participating schools designate a point person to coordinate with the design-team leader and ensure integration with school improvement goals. Existing MOUs between Notre Dame and participating districts establish clear expectations around data sharing, student screening and matched literacy support, scheduling, training participation, and space allocation. Principals and district leaders confirm their commitment through letters of participation, ensuring alignment with school literacy goals. The design team supports the school with capacity-building for high-impact tutoring and, as requested, hosting professional learning for school-based staff (e.g., aides, school volunteers) and providing family engagement opportunities, including parent workshops and take-home literacy packets.

University Partner Selection and RFA Process

IDOE and Notre Dame will jointly administer a structured Request for Applications (RFA) at the start of Year 1 to select the final group of university partners to serve as regional spokes. Several cognitive science research groups and faculty preparing preservice teachers at schools of education have already expressed interest (see Appendix J.6 for letters of interest). The RFA will be publicly posted on IDOE and Notre Dame websites and shared through higher-education networks. Eligible applicants must be located near Indiana elementary or K-8 schools with < 85% pass rate on IREAD. They must have: (a) expertise in the science of reading, including doctorate-level expertise in disciplines that comprise the interdisciplinary field of cognitive science (e.g., education, psychology, neuroscience); (b) demonstrated capacity and

interest to host a learning design team connected to the central Tutor-ND hub, which has multiple faculty and staff who collectively bring expertise in the science of reading and related cognitive science disciplines necessary for supporting implementation, data analysis, and continuous improvement; and (c) a history of ethical, collaborative partnerships with local schools or youth-serving community organizations.

Applicants may propose to serve as (a) a regional hub overseeing several design teams, or (b) a single design team anchored in a university lab or course. This flexibility allows smaller institutions to participate meaningfully, while larger research universities can coordinate multi-site operations. Applications will be reviewed by a joint IDOE-Notre Dame review committee using predefined criteria (e.g., geographic area, commitment to data sharing and fidelity standards, public service motivation of the PI, alignment with state literacy priorities). IDOE will have the final approval. Selected partners will enter into participation agreements outlining roles, training requirements, and expectations for data use, fidelity monitoring, and sustainability. This process ensures transparency and statewide representation. We are ready to launch as soon as the grant period begins.

Phased Implementation and Scaling

Scaling follows a structured five-year plan that allows for continuous improvement and cost-effective expansion:

Year 0-0.5: Maintain and refine 10 existing high-impact tutoring sites in high-need schools in South Bend near the main Tutor-ND hub to serve as models for training and demonstration (not part of the RCT because they are already receiving hub support for high-impact tutoring). Issue and publicize the RFA and select university partners to serve as regional hubs and learning design teams. Review applications and finalize participation agreements. Identify additional state-prioritized schools and block-randomize 68 priority sites to either full high-impact tutor capacity-building support for increasing IREAD pass rates or to

control light-touch support. Train initial hub and spoke staff, and finalize all MOUs and data-sharing agreements.

Year 0.5-1.5 (AY 1): Launch design teams in 10 new *Cohort 1* treatment schools (plus 10 matched controls receiving light-touch support). Regional hubs begin coordination with the central Notre Dame hub. Refine training systems, practice-based mentoring, and fidelity monitoring. Conduct early implementation and cost analyses.

Year 1.5-2.5 (AY 2): Expand to 12 additional *Cohort 2* treatment schools (plus 12 matched light-touch controls). Regional hubs oversee onboarding of new learning design teams and ensure consistent tutor training and fidelity monitoring.

Year 2.5-3.5 (AY 3): Expand to 12 additional *Cohort 3* treatment schools (plus 12 matched light-touch controls). Maintain high-impact tutoring across all 34 treatment schools. Extend the treatment to Cohort 1 light-touch controls, after the measurement period for Cohort 1 concludes. Conduct mid-study fidelity and impact analyses with WestEd.

Year 3.5-4.5 (AY 4): Extend the treatment to Cohort 2 light-touch controls, after the measurement period for Cohort 2 concludes. Complete the impact evaluation, disseminate results and conduct statewide public campaigns to connect schools to the main hub's open-access materials. Finalize the sustainability and state integration plan, including the cost analysis study, and detail how the model will be maintained through existing funding streams, outcomes-based contracting, and workforce development initiatives.

Year 4.5-5.0: Conduct final reporting, dissemination, and statewide convening of partners to codify replication processes for additional university-based hubs and embed the model within Indiana's long-term literacy and workforce development strategy. Identify additional funding streams to continue supporting all schools, including extending the treatment to Cohort 3 light-touch controls.

Communication, Decision-Making, and Monitoring

Milestones are tracked quarterly through shared Airtable dashboards monitored by IDOE, Notre Dame, and WestEd. Project leadership meets bi-weekly to review implementation progress and identify emerging needs. Monthly coordination calls bring together IDOE, Notre Dame, and WestEd to align on evaluation timelines, fidelity metrics, and communications. Quarterly progress reviews include written performance reports from Notre Dame to IDOE summarizing recruitment, training, fidelity, and expenditure data. Semesterly workshops or colloquia focused on the science of reading are held at each regional hub to bring together learning design teams in shared learning and discussion. Annual synchronous meetings convene all partners, including representatives from each university hub and learning design team, to review results, celebrate success, and plan adaptations.

Tutor-ND's Managing Director, in collaboration with the Center for Educational Research and Action's Impact Specialist, coordinates all communications among hubs and spokes. They are supported by three program managers, one focused on design-team and tutor training, one on the science-of-reading, and one on communications, ensuring consistent messaging and timely problem solving across all levels of the project. If recruitment, fidelity, or data-reporting benchmarks fall below predefined thresholds, the leadership team initiates corrective action within the next quarterly review cycle.

Data Management and Evaluation Coordination

Data flow follows formal data-sharing agreements among IDOE, Notre Dame, and WestEd. IDOE provides school-level data publicly, which includes disaggregated IREAD results dating back to 2018. For the evaluation, IDOE provides WestEd with de-identified student-level assessment data (e.g., IREAD) required for impact analyses via secure transfer protocols. Tutor-ND collects programmatic implementation data, including student screening and progress monitoring data, closing tickets, surveys, and fidelity rubrics, in secure systems (Airtable,

Qualtrics). The Center for Research on Educational Opportunity prepares and securely transfers de-identified Tutor-ND implementation data linked to state assessment data for WestEd’s use in the main evaluation. In parallel, they conduct independent replication analyses using a distinct de-identified dataset to enhance rigor, while preserving WestEd’s independence.

Feasibility and Capacity

IDOE and Notre Dame maintain an active data-sharing agreement and have a long history of collaboration on statewide data and analytic initiatives. Notre Dame and WestEd have partnered successfully on multiple IES-funded development and efficacy studies. Tutor-ND has already piloted hub-and-spoke operations with universities and nonprofits in other states to refine key programmatic components, such as design-team leader and tutor recruitment, professional learning, fidelity monitoring, and progress monitoring in both schools and community settings. These lessons are codified into standard operating procedures, training modules, observation rubrics, and secure data management workflows (Airtable, Qualtrics) that are ready for statewide adaptation and scale.

The management plan defines clear lines of authority, decision routines, and predictable reporting cadence. Start-up risk is minimized through centralized infrastructure, standard MOUs, and ready-to-launch training assets. Each organization brings proven capacity: IDOE’s statewide systems, policy innovation, and contracting authority; Notre Dame’s management of large federal projects (e.g., IES, NSF, AmeriCorps) and successful operation of the Tutor-ND capacity-building hub; and WestEd’s WWC-aligned evaluation expertise. All training assets and data systems are already operational, enabling immediate start-up for the Cohort 1 schools upon award with no dependency on future infrastructure development. Budget monitoring is integrated into quarterly reporting through shared dashboards and joint IDOE–Notre Dame financial reviews to ensure the project achieves milestones and key deliverables within budget.

B.3. Core Strategic Partners

Indiana Department of Education (IDOE, lead applicant) - Indiana is uniquely positioned to expand access to Tutor-CogSci. The IDOE has set an ambitious goal of achieving a 95% third-grade IREAD pass rate by 2027 and has enacted comprehensive science of reading legislation to support this target. It has demonstrated a strong track record of collaboration with higher education institutions on complementary initiatives. For example, IDOE partnered with the University of Indianapolis and Marian University to launch a statewide Literacy Cadre, offering collaborative professional development and school based literacy coaching for K-3 teachers. With support from the Lilly Endowment, the state strengthened alignment between its teacher preparation programs and the science of reading.

Indiana leads the nation in transparency and public accountability, publishing school-level IREAD pass rates and attendance data (disaggregated by student group) for public, charter, and nonpublic schools. These public-facing datasets enable comparisons across school choice sectors. In 2025, legislative reforms expanded the Choice Scholarship voucher program, aligning state efforts with federal Education Choice priorities (*Competitive Priority 2*).

IDOE maintains a longstanding data-sharing agreement with the Institute for Educational Initiatives at Notre Dame, originally established in 2012, and renewed through 2030. This agreement allows secure, rapid access to student data at the individual level by approved project partners and has enabled rigorous, independent research that informs education policy and benefits Hoosier students and families. IDOE's broader workforce development agenda, including the Graduation Pathways initiative and Next Level Programs of Study, underscores its investment in work-based learning, an area directly supported by this project's internships in education, cognitive science, and data science. Taken together, these policy conditions, partnerships, and infrastructure investments make Indiana an ideal launch site for a scalable tutor

capacity-building network that partners with public, charter, and private schools and generates high-quality evidence to guide policy and support replication.

Notre Dame (lead implementation partner) - Notre Dame is committed to this work and is the ideal partner to lead Indiana's tutor capacity-building hub. It is a top 25 university with a national reputation for excellence in research, teaching, and public service and has been recognized by the Carnegie Foundation for its distinguished record of community engagement. Since 2021, the university has invested well over \$1 million in institutional resources alongside a \$640,000/year AmeriCorps VGF grant (2023-2026) to establish sustainable infrastructure for high-quality tutor preparation rooted in cognitive science. These investments include dedicated faculty and staff time, technology platforms, curriculum and training support, marketing and tutor recruitment for community partners, data-informed partner consulting, and community events such as public screenings of *The Right to Read* and the *Unlocking Literacy* symposium featuring keynote speaker Mark Seidenberg. It was a founding member of the Aspiring Teachers as Tutors Network. These initiatives reflect the university's sustained commitment to expanding access to evidence-based literacy instruction and supporting the development of future educators. As lead implementation partner, Notre Dame will continue expanding its regional partnerships while codifying implementation practices into a scalable, fidelity-supported model. It will support other higher education institutions to serve as satellite hubs to implement the model in priority schools across Indiana. Notre Dame will oversee logistics, training, and continuous improvement efforts, ensuring alignment with Indiana's Science of Reading priorities.

WestEd (evaluator) - WestEd brings a nationally respected reputation for rigorous evaluation and scale-up of evidence-based educational interventions. Their involvement ensures high-quality evaluation, fidelity monitoring, and the capacity to disseminate findings to inform both state policy and national replication efforts. This project will be supported by the WestEd Learning, Technology, and Innovation Division, which includes experts in cognitive science and

educational research methods who have helped lead IES-funded National Centers and a Regional Educational Laboratory. Notre Dame and WestEd have successfully partnered on two previous IES-funded studies, including an efficacy trial that met *WWC Standards Without Reservations* (Davenport et al., 2022), which demonstrates their capacity to collaborate effectively. WestEd is fully committed to serving as the external evaluation partner for this project and has already begun co-developing the evaluation plan and fidelity monitoring systems in collaboration with Notre Dame and the IDOE.

B.4. Plan to Deliver Project Services Efficiently and Effectively

Indiana’s plan for scaling high-impact tutoring delivers services efficiently, effectively, and sustainably by combining centralized coordination with implementation that is anchored locally. The approach leverages existing university, school, and community infrastructure to create a layered system for strengthening existing human capacity in ways that deepen impact within each partnering school while minimizing duplication and maintaining quality, fidelity, and continuous improvement of each school’s individual tutoring program.

Hub-and-Spoke Infrastructure for Cost-Effective Scale. The statewide system will build on the Tutor-ND infrastructure, managed at Notre Dame, which functions as the statewide coordinating hub, with regional spokes housed at partner universities (see Appendix J.6 for letters of interest). Each spoke connects a design team with nearby schools and community organizations, providing consistent training, shared data systems, and open-access materials that reduce cost per tutor and per student. IDOE ensures policy alignment with state literacy goals, while Notre Dame oversees recruitment, training, communications, implementation support, and data monitoring across participating sites.

Workforce Development as a Core Efficiency Strategy. Unlike commercial tutoring programs that focus on service delivery, Tutor-CogSci multiplies impact by simultaneously building the future youth-serving workforce. The program recruits college students, high school

students, and instructional aides, training them through a structured sequence of modules, supervised practice, and embedded knowledge checks with feedback. Participants must complete all required onboarding, background checks, and pre-tutoring training activities before working with children and continue to receive support and feedback through design-team leader weekly monitoring of closing tickets and whole group design-team meetings. This structure ensures consistent, high-quality implementation while developing career-relevant knowledge and skills.

Tutors complete a standardized hybrid training sequence that includes asynchronous modules, live workshops, embedded checks for understanding with feedback, and participation in Science of Reading colloquia. Training covers the full developmental literacy trajectory and includes supervised practice implementing practices and programs that meet WWC evidence standards. Design-team leaders receive training on the science of reading, research-practice partnership, motivating young people, leading learning design teams, monitoring fidelity, and using student data to guide instruction. This workforce pipeline creates a steady supply of skilled educators and youth-serving professionals while reducing cost per hour of tutoring over time.

Tiered Service Model Focused on Depth and Reach. Efficiency is achieved through a two-tiered approach that focuses intensive tutoring where it is most needed, while expanding literacy capacity across the entire third-grade ecosystem. It includes: (a) Direct high-impact tutoring during the school day for students identified through standardized decoding and fluency assessments; (b) Capacity-building support for aides, school-based staff, and volunteers, who receive training and resources for progress monitoring and evidence-based literacy instruction; and (c) Parent engagement through family literacy events, individualized take-home packets aligned to student's spot on the developmental literacy trajectory, and an *Ask a Cognition Expert* service accessible to both educators and parents. This structure maximizes efficiency by serving a manageable subset of students directly in high-impact tutoring while equipping the other informal educators who support students at the school to reinforce evidence-based reading

practices aligned with the science of reading across school and home environments.

Implementation Supports and Communication Channels. Each site includes a design-team leader who coordinates with the school's designated literacy lead to manage tutoring logistics, models lessons, reviews data, and leads learning design team meetings to solve problems of practice. Design-team leaders and tutors use standardized observation rubrics and participate in design team meetings to share lessons learned and maintain consistency. Each semester the main hubs host a science of learning event designed to bring design teams together. For example, Science of Learning Sessions and Unlocking Literacy Symposium. The *Ask a Cognition Expert* dashboard provides real-time consulting support, while the central hub distributes quarterly newsletters highlighting implementation data, innovation, and success stories, ensuring statewide coordination and continuous learning.

Continuous Improvement and Data-Driven Decision Making. All learning design teams follow a design-based improvement cycle: implementation, analysis, and redesign. Tutors are required to submit standardized closing tickets after every tutoring session to capture attendance, fidelity, and placement/progress-monitoring results, enabling local learning design teams to analyze data and test small-scale refinements. Shared dashboards and reports allow efficient communication across sites while preserving flexibility for contextual innovation.

Maintaining Quality While Reducing Cost. As regional hubs mature, reliance on the central Notre Dame hub decreases and school-based staff and aides take on greater responsibility for sustaining tutoring and data review. Shared digital infrastructure for training, progress monitoring, and communication minimizes marginal costs. By embedding workforce development into tutor training, Indiana ensures that each dollar invested yields both immediate gains in literacy and long-term growth in educational capacity. If shown to be effective, the state's EARN internship support and contracting focused on impact will sustain the model beyond the grant period as a model of both school capacity-building and workforce development.

B.5. Dissemination Plan

Dissemination is one of the primary purposes of Tutor-CogSci. With the support of a dedicated Research and Practice Impact Specialist, the hub will ensure that project findings, materials, and tools reach educators, administrators, parents, researchers, and policymakers.

Statewide Campaign. IDOE and Notre Dame will launch a comprehensive campaign to build awareness and demand for the hub. Leveraging IDOE's statewide channels, including the Indiana Learning Lab, which has reached 100,000 subscribed educators, we will spotlight results and share the free, open-access resources that are approved by the IDOE for sharing broadly. These will include training modules, assessment guidance, data-based decision-making tools, and downloadable instructional routines and curriculum inserts for tutors, aides, and other volunteers. We will produce accessible briefs, videos, and digital stories that highlight how high-impact literacy tutoring improves literacy outcomes, strengthens skills in the workforce, and supports families.

Signature Literacy Events. Each spring, Notre Dame will host the *Unlocking Literacy Symposium*, where tutors, research trainees, and seasoned educators showcase evidence-based strategies. The inaugural event with leading cognitive scientist and author of *Language At the Speed of Sight*, Mark Seidenberg, last spring drew a packed house, and future symposia will aspire to the same. To extend this momentum statewide, we will partner with our regional partners to host similar events.

National Practitioner Dissemination. We will reach a national audience of practitioners through direct outreach to established contacts at IDOE, Notre Dame, and WestEd with the monthly dissemination of resources and findings via email newsletters to teachers and principals nationwide, as well as through a digital campaign leveraging over 588,400 combined social media followers.

Research Dissemination. Research findings will be shared at leading national

conferences, including the American Educational Research Association (AERA), Cognitive Science Society, Society for Research in Child Development, and Society for the Scientific Study of Reading. Manuscripts will be submitted to top journals and practitioner outlets such as *Child Development*, *Journal of Educational Psychology*, *Journal of Reading Research*, and *Educational Leadership*.

Policy Dissemination. Notre Dame's DC Office will co-lead targeted outreach to policymakers, including legislative briefings, roundtables, and contributions to national education networks. Our co-PI from Notre Dame has already co-authored [REDACTED] [REDACTED] with Deans for Impact, which demonstrates the desire and capacity to translate evidence into actionable policy. The DC office can further elevate the hub's impact by connecting project findings to federal priorities such as evidence-based tutoring, teacher workforce development, and learning recovery. They will also serve as a liaison to key congressional staff and federal agencies, ensuring that insights from our work are positioned to inform emerging legislation and funding opportunities in education. In addition, [REDACTED] from Deans for Impact, who leads the organization's policy and advocacy initiatives, will collaborate with the Notre Dame DC team to shape messaging, co-host policy discussions, and connect project findings to national and state-level education reform efforts.

Replication and Scalability Infrastructure. In addition to broad communication, the hub is intentionally designed with infrastructure needed for reliable replication and scale. A continuous improvement cycle refines standard operating procedures, training modules, fidelity rubrics, and implementation guides to ensure new partners can adopt the model consistently while adapting to local contexts. The core evidence-based components are clearly defined, and all materials and implementation checklists are provided as open-access resources. These tools ensure quality control within Indiana, and enable other states, universities, and organizations to replicate the model effectively in their own contexts.

(C) Quality of the Project Design

C.1. Logic Model

The proposed project is guided by a logic model that specifies how inputs, activities, outputs, and outcomes are linked to generate both short- and long-term impacts (see Appendix [G.1](#) for full logic model). Tutor-CogSci connects tutors to cognitive science through an approach that integrates two traditions often treated as competing in education: (a) generating robust causal evidence about “what works” using design principles for effective tutoring and WWC-rated programs, and (b) serving practitioners through design-based implementation with iterative cycles of implementation, analysis, and refinement (Brown, 1992; Bryk, 2009). By intentionally blending rigorous causal evidence with context-driven adaptation, Indiana advances an innovative model for scaling high-impact tutoring that ensures both quality and relevance.

Inputs include WWC-aligned practices for decoding and oral reading fluency, evidence-based tutoring programs (e.g., Sound Partners), structured tutor preparation, research-practice partnerships across the state, university-based learning design teams, and operational supports such as instructional coaches, transportation systems, and school-based tutoring space. These enable four core activities: (1) recruitment and onboarding of tutors whose values align with public service motivation; (2) structured training and ongoing professional development; (3) delivery of high-impact tutoring aligned with the science of reading; and (4) continuous improvement through design-based implementation, including observations, feedback loops, and A/B testing.

Outputs include numbers of tutors trained, schools and students served, sessions delivered, fidelity data, and publicly available tutor guides and adaptations disseminated through the hub. In the short term, tutors gain expertise in evidence-based literacy practices, students demonstrate measurable gains in decoding and fluency, and schools improve IREAD pass rates consistent with pilot results. Long-term outcomes include sustained literacy gains, improved

parent confidence in their children’s schools and enrollment stability, and a strengthened educator workforce equipped with knowledge of the science of reading and cognitive science.

C.2. Clearly Specified and Measurable Goals, Objectives, and Outcomes (see Appendix J.7)

Goals and Objectives	Measurable Outcomes
Goal 1: Improve literacy outcomes by expanding access to evidence-based literacy support aligned with the science of reading	
1.1. Increase the number of Indiana schools implementing structured, evidence-based literacy tutoring and progress monitoring	≥ 75 schools (100% high need defined as < 85% IREAD pass rate in 2025) connected to Tutor-CogSci by AY3; 68 schools randomly assigned in AY1 for to full treatment/light touch for evaluation; ≥ 35 schools provide high-impact literacy tutoring for at least 20 weeks/year by AY3
1.2. Ensure all hub-supported 2nd and 3rd grade students are screened and supported	≥ 90% of 2nd- and 3rd-grade students in all participating schools complete a DIBELS ORF in fall; students "not yet on track" receive progress monitoring at mid and end of year using the same measure; by end of AY4 ≥ 9,000 students served, ≥ 2,000 of which receive direct, high-impact tutoring aligned to the design-principles for effective tutoring during the school day
1.3. Increase reading achievement	≥ 85% of treatment schools demonstrate a positive year-over-year IREAD pass rate gains; ≥ 75% of treatment schools meet or exceed school-specific IREAD pass rate targets; treatment schools outperform active controls on IREAD pass rates (AY2, AY3, AY4); ≥ 75% of tutored students identified as not yet on track for passing IREAD meet or exceed ORF growth goal (+20 cwpm per 20 weeks of tutoring)
Goal 2: Strengthen Indiana's human infrastructure for sustainable, evidence-based literacy support	
2.1. Recruit and support university-based regional hubs and learning design teams	≥ 5 university faculty, centers, or labs selected through RFA process to lead regional hubs or associated learning design teams; ≥ 30 learning design teams operating by AY3 (each serving 2-4 schools)
2.2. Recruit, train, and support an excellent tutor corps and informal school-based educators (e.g., aides, volunteers, parents)	≥ 1000 tutors and informal educators trained and supported annually by AY2; ≥ 85% of high-impact tutors complete required pre-service training and pass post-training assessments 85% high-impact tutors retain through semester committed; ≥ 85% of learning design teams meet fidelity thresholds for training and data use; ≥ 4 informal educators trained and ≥ 1 family event per treatment school each academic year

Goal 3: Foster continuous improvement and cost efficiency through data use	
3.1. Engage learning-design teams in data-driven improvement cycles	85% of tutors attend ≥ 3 design team meetings per 10 weeks of scheduled high-impact tutoring; $\geq 85\%$ complete $\geq 85\%$ of session closing tickets; annual cost analysis memo (ingredients method) with targets $\leq \$1,000$ per student served and $\leq \$4,000$ per student matched with high-impact tutor
3.2. Use program data to evaluate and improve program quality and cost	85% of tutors complete their end of semester feedback survey; 85% of tutors complete their mid-semester progress reports; 85% of tutors complete at least 85% of their closing tickets after each session; annual cost analysis memo using the ingredients method with recommended action items to achieve or maintain costs of $\leq \$1,000$ per learner served (inclusive of all hub-supported students) and $\leq \$4,000$ per student receiving direct, high-impact tutoring
Goal 4: Conduct a rigorous, independent evaluation and disseminate findings to enable scaling and replication	
4.1. Implement an independent impact evaluation meeting WWC Standards Without Reservations (including specifying key components, mediators, outcomes, fidelity thresholds)	IRB addendum approval and study pre-registration by start of AY1 (yes/no); ≥ 34 treatment and 34 light-touch control schools included in impact analysis; mid-study analysis by Year 3; final evaluation by Year 5.
4.2. Generate replicable knowledge and scaling guidance	Annual implementation and fidelity reports produced by WestEd (yes/no); annual cost-effectiveness memo and scaling recommendations submitted to Notre Dame and IDOE (yes/no); final evaluation report publicly available within 12 months of study completion (yes/no)

(D) Quality of the Evaluation and other Evidence-Building

D.1. Evaluation Designed to Meet WWC Standards Without Reservations

WestEd will serve as the independent third-party evaluator and brings extensive experience conducting rigorous, large-scale studies that meet WWC standards without reservations (e.g., Davenport et al., 2023). The WestEd team will design and execute the random assignment, collect all administrative data, and conduct all analyses, ensuring the evaluation is independent from program implementation.

The core hypothesis is that Tutor-CogSci, which strengthens schools' human infrastructure for high-impact tutoring and informal literacy support aligned with the science of reading, will improve Grade 3 reading outcomes. The evaluation will answer critical questions about the impact and implementation of Tutor-CogSci with two confirmatory research questions. The confirmatory questions ask (RQ1) What is the impact of Tutor-CogSci on IREAD pass rates by the end of third grade compared to schools not yet implementing the full model? (RQ2) Among 2nd and 3rd grade students who score below benchmark on the beginning-of-year Dynamic Indicators of Basic Early Literacy Skills (DIBELS) Oral Reading Fluency (ORF) subtest, what is the impact of Tutor-CogSci school on end-of-year ORF performance, relative to students at schools not yet implementing the full model? The study is designed to meet WWC 5.0 standards without reservations.

Evaluation Design.

Outcome Measures. The primary confirmatory outcome measure is the IREAD. The IREAD is Indiana's high-stakes, pass/fail third-grade reading assessment that determines promotion eligibility. The IREAD measures phonics, vocabulary, and reading comprehension. Because the IREAD measures both alphabetic (phonics) and comprehension (vocabulary and reading comprehension), the WWC classifies the IREAD as an outcome in the general reading achievement domain (WWC, 2014). All students initially take the IREAD in March of second grade and receive classifications of "at risk", "on track", or "pass" at that time. Students who did not pass in second grade re-take the IREAD in March of third grade, and again in May or June (sometimes both) if they still have not passed. As a state standardized measure, the IREAD is considered valid and reliable by WWC.

The co-primary outcome measure is the DIBELS ORF subtest. Schools participating in Tutor-CogSci routinely administer it as a screening measure to second and third graders. The DIBELS ORF subtest is a standardized, individually-administered measure of a student's ability

to read passages aloud (University of Oregon, 2023). The WWC classifies the ORF subtest as an outcome in the reading fluency domain (WWC, 2014). The ORF subtest has demonstrated strong reliability, with alternate form reliability ranging from 0.95-0.97 and test-retest reliability above 0.87 for second and third grades (University of Oregon, 2018). The ORF subtest was developed by the University of Oregon, is widely used as a district-wide early literacy diagnostic measure, and meets WWC face validity, reliability, and independence criteria for outcome measures.

Both the IREAD and ORF will be administered to students in all participating schools (treatment and control) following routine standardized and diagnostic testing procedures, ensuring consistent data collection across the treatment and control conditions.

Sample Design, Condition Assignment, and Controlling for Confounding Factors. The study will define four Tutor-CogSci regions in Indiana and recruit three successive cohorts of schools to participate in the study in each region. This method of study recruitment will ensure representation across Indiana, from urban Indianapolis to rural southern Indiana.

Our target sample size is 68 schools, divided across three cohorts and the four regions. WestEd will treat each region as a block, recruit at least four schools per cohort per region, and randomly assign half of study schools within each region and cohort to treatment and half to control. School is the appropriate unit of assignment because Tutor-CogSci is a school-level treatment that connects a university-based design team to the school, embeds high-impact tutoring into the regular school day, coordinates with school literary leaders, involves school-level systems for identifying and monitoring students, and provides training and resources for instructional aides, other school-based staff, volunteers, and parents. This method of recruitment and randomization ensures that $N = 1$ and time are not confounding factors.

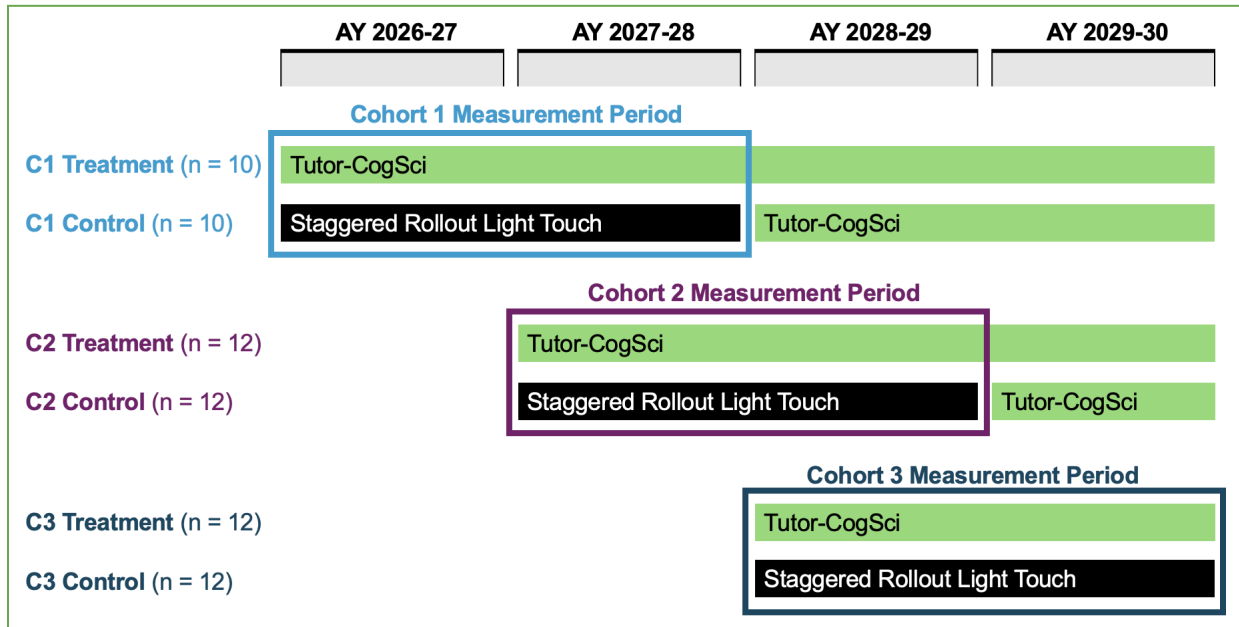
We conducted a power analysis using the PowerUpR R package (Bulus et al., 2021) and a two-level cluster-randomized design with treatment at Level 2 (school). Due to the small number of regions, we have chosen not to model the region as a third level, instead accounting for both

region and cohort as fixed effects at Level 2. We consulted the IREAD technical report (Indiana Department of Education, 2023), the DIBELS technical manual (University of Oregon, 2018), and the Variance Almanac (Hedges & Hedberg, n.d.) to derive reasonable estimates for power analysis parameters. We estimated the proportion of variance in the outcome between schools (ρ_2) to be 0.15, the proportion of Level 1 (student) variance explained by Level 1 covariates (R_1^2) to be 0.8 and the proportion of Level 2 (school) variance explained by Level 2 covariates (R_2^2) to be 0.5. We estimate that participating schools will have an average of 70 students in each grade. Using an alpha threshold of 0.05 and 80% power, our target sample size yields a minimum detectable effect size (MDES) of 0.19, which is smaller than effect sizes from prior studies of literacy tutoring programs, suggesting this study is sufficiently powered (Nickow et al., 2020; Vadasy et al., 2011).

Schools randomly assigned to receive the treatment will receive all features of Tutor-CogSci, including science-of-reading trained tutors providing high dosage tutoring with ratios of no more than 1:3 tutor to student ratios, implementation feedback cycles, “Ask a Cognition Expert,” shared data systems, professional learning opportunities for instructional aides and school-based staff, and parent resources. Schools randomly assigned to the control (staggered rollout light touch) condition, will have access to business-as-usual literacy instruction and assessments (IREAD/ ORF) and will have access to all the Tutor-CogSci publicly available online resources and support, but will not receive additional on-site capacity building for recruiting, training, and supporting high-impact tutors with university-based design team until the post-study period.

Figure 1 shows the anticipated size and timeline of study participation for each cohort. For each cohort, the study measurement period will span two years. Schools assigned to the treatment condition will join Tutor-CogSci at the beginning of their study participation. Schools

assigned to the control condition will be part of the staggered rollout process but will not receive the full support for implementing high-impact tutoring until after the measurement period is over.

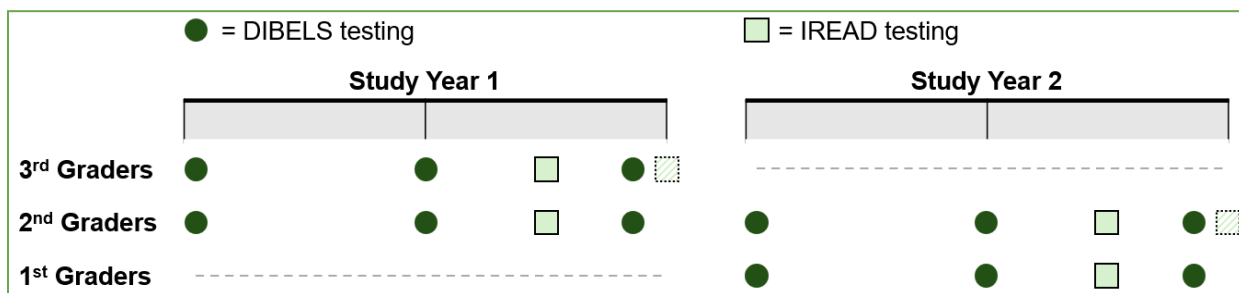


Note: Figure 1 above shows only the analytic sample for the formal RCT evaluation.

Study schools will meet three eligibility criteria: (a) serve grades K-3 including at least 40 third-grade students, (b) fall within the service area of a participating hub, and (c) have historical IREAD pass rates below 85%. Based on Indiana's commitment to literacy improvement and the high stakes created by recent legislation requiring retention for students not passing IREAD, we anticipate strong participation.

Testing Procedures and Timeline for Study Schools.

Figure 2 shows the study enrollment and testing timeline for each participating school.



Students who are enrolled in third grade at the beginning of their school's study participation will take the ORF in Fall of that first year. These students take the ORF again in Winter, the IREAD in March, and the ORF again in Spring. Students who did not pass the IREAD in March will take the IREAD again in May and/or June. Students who are enrolled in second grade at the beginning of their school's study participation will take the ORF in Fall of that first year. Students who have not reached the ORF benchmark at this first administration will be enrolled in the study and followed for two years. These students will take another ORF in Winter, the IREAD in March, then the ORF again in Spring. In the second study year, these students will follow the third grade testing schedule.

Students who are enrolled in first grade at the beginning of their school's study participation will take the ORF in Fall of the second measurement year, as second graders. Those who have not reached the ORF benchmark at this administration will be enrolled in the study and followed to the end of second grade. These students will follow the second grade testing.

[Monitoring for Attrition and Compositional Change](#)

WestEd will monitor for both cluster-level (school-level) and individual-level (student-level) attrition. Given state-level commitment, the school-based intervention, and the exclusive use of administrative data for the outcome analysis, we expect school-level and individual-level attrition to be low. We will collect school rosters of students in Grades 2-3 at the start of the measurement period along with students' IREAD and ORF scores from all schools. ORF will be collected each fall, winter, and spring to measure growth in reading fluency, while IREAD will be collected each June after the final third grade administration as the primary outcome measure. In the second year of the measurement period, a new class of students will join the study at each school, having progressed from Grade 1 to Grade 2. In order to minimize the risk of bias from joiners, we will also collect all Grade 1 rosters from every participating school at the beginning of the measurement period so we can verify which students were already

enrolled at the time of randomization. Nonetheless, the WWC considers the risk of bias from joiners to be low because the school is the unit of assignment.

We will track student-level attrition, whether it be through students leaving the school or missing outcome data, and assess the level of representativeness of the students who contribute outcome data at each school. Although this study is designed to meet WWC standards without reservations, random assignment could be compromised in the rare cases of high attrition. We will calculate both overall attrition rates and differential attrition between treatment and control conditions. Per WWC 5.0 standards, overall attrition below 10% presents low risk of bias. If overall attrition falls between 10-20% and differential attrition is less than 10 percentage points, we will conduct baseline equivalence tests using standardized mean differences ($SMD < 0.05$ indicating equivalence) on IREAD pass rates and DIBELS ORF scores. If attrition thresholds are exceeded and baseline equivalence cannot be established, we will adjust for baseline performance in the analytic models and report these as sensitivity analyses rather than primary confirmatory analyses.

Estimating the Treatment Effect

We will use an intent-to-treat (ITT) analysis, analyzing students and schools in their originally-assigned conditions, regardless of their level of participation in the Tutor-CogSci. Only students with complete data will be included in the analytic sample. In general, we will use the below two-level hierarchical linear model with students at Level 1 (i) and schools at Level 2 (j) to estimate the treatment effect.

Level 1:

$$Outcome = \beta_{0j} + \beta_{1j}BaselineORF_{ij} + \beta_{2j}Grade_{ij} + \sum \beta_{Dj}Demographics_{ij} + \varepsilon_{ij}$$

Level 2:

$$\beta_{0j} = \gamma_{00} + \gamma_{01}Tx_j + \gamma_{02}IREADPass_j + \gamma_{03}TitleI_j + \sum \gamma_{0C}Cohort_j + \sum \gamma_{0R}Region_j + \eta_{0j}$$

In this model, γ_{01} represents the average treatment effect of Tutor-CogSci, controlling for baseline characteristics and accounting for regional and temporal variation through block and cohort fixed effects. *Outcome* represents the outcome of interest. *Baseline* represents a student's first DIBELS ORF raw score. *Grade* represents the student's grade. *Demographics* is a vector of covariates selected for their associations with English reading skills (e.g., special education status, eligibility for free/reduced lunch), to increase the predictive power of our model (Indiana State Board of Education, 2025). *Tx* is a dichotomous variable indicating the school's condition assignment. *IREADPass* is the proportion of 3rd grade students at the school who passed the IREAD in the spring prior to beginning study participation. *TitleI* is a dichotomous indicator for the school's Title I status. *Cohort* is a vector of two dummy-coded indicators for the school's study cohort. *Region* is a vector of three dummy-coded indicators for the school's region. Random effects at each level are represented by ε and η .

RQ1. What is the impact of Tutor-CogSci on passing IREAD by the end of third grade compared to schools not yet implementing the full model? To answer RQ1, we will analyze IREAD 3rd grade pass rates at the end of each school year. The reference sample for this analysis will be all 3rd graders who appeared on school rosters at the beginning of their school's measurement period. We will adapt the above 2-level model to a hierarchical generalized linear model (HGLM) to account for the binary outcome (passed/did not pass). We will replace *Outcome* with a logit link function to connect the probability of passing with the predictors and removing the student-level error term. We will also add a term to Level 1 to indicate whether the student passed the IREAD as a second grader.

RQ2. Among 2nd and 3rd grade students who score below benchmark on beginning-of-year ORF, what is the impact of Tutor-CogSci school on end-of-year ORF performance, relative to students at schools not yet implementing the full model? To answer RQ2, we will analyze spring DIBELS ORF performance at the end of each school year. This

analysis will only include those 2nd and 3rd graders who appeared on rosters at the beginning of the school's measurement period and who did not meet the ORF benchmark on the fall test administration. We will analyze students' raw scores using the model described above. We will also estimate the effect of treatment on whether students met the ORF benchmark (a binary outcome) by replacing *Outcome* with a logit link function to connect the probability of meeting the benchmark with the predictors. We will also remove the student-level error term.

D.2. Guidance on Effective Strategies Suitable for Replication or Testing

The evaluation is explicitly designed to generate actionable guidance for replicating, adapting, and scaling Tutor-CogSci across contexts. WestEd's comprehensive implementation study will document core components, sources of variation, and conditions for success, to ensure the findings yield practical guidance for the field and replication in other states.

Implementation Research Design

Our mixed-methods implementation study uses multiple data sources to capture the full complexity of the treatment. Closing tickets completed by tutors after each session and reviewed by design-team leaders weekly will track dosage, content, grouping configurations, and student engagement. Quantitative measures will be complemented by qualitative data from semi-structured interviews with hub coordinators (n=4 per year), school principals (n=12 per year), and focus groups with tutors at each hub site (yearly). To understand adaptation and variation, we will purposefully sample schools representing different contexts, e.g., large urban districts versus small rural districts and higher versus lower baseline achievement. Within each context, we will document how core components are maintained or adapted and examine associations with implementation quality and outcomes. We will also conduct yearly site visits to a random sample of schools for observations and to identify any other potential contextual factors affecting implementation. Together, these methods will produce an empirically-grounded understanding of how the model functions across settings and the factors that affect replication.

Documenting Core Components

Our implementation study will produce detailed specifications of essential program elements throughout each stage of the hub implementation. Initially we will capture information related to the hub infrastructure (e.g, design-team leader-to-tutor ratios across different contexts), physical space requirements, technology needs for data management and communication, and partnership structures between universities and schools. Cost analyses will capture personnel, materials, training, and overhead expenses, enabling future sites to project budgets accurately. Next, the evaluation will codify tutor recruitment strategies that successfully engage university students, high school students, and community members. Once tutors are engaged, we will document the initial training curriculum aligned with the science of reading, including modules on phonemic awareness, phonics, fluency, vocabulary, and comprehension and will capture training effectiveness through competency assessments. Once tutors are working with students, we will specify the essential elements of effective tutoring sessions: lesson structure (warm-up, explicit instruction, guided practice, assessment), curriculum alignment with Indiana’s Science of Reading goals, differentiation strategies based on student skill levels, and progress monitoring protocols. We will identify which components are fixed versus flexible, enabling appropriate local adaptation. Finally, we will monitor the hubs’ quality assurance and continuous improvement processes that maintain quality at scale.

Replication Guidance Products

Building on implementation findings, the main Tutor-CogSci hub will create practical tools for replication such as implementation guides for state education agencies, districts, schools, and hub coordinators, each tailored to their specific roles and decisions. These playbooks will include planning tools, sample agreements, job descriptions, training materials, and troubleshooting guides based on common implementation challenges observed during the evaluation. The guides will include a framework for making informed adaptations while

maintaining core components, including decision trees for common scenarios (e.g., “If you cannot recruit enough university students, here’s how to adapt using community volunteers while maintaining quality”).

D.3. Fidelity of Implementation and Contextual Factors

We will monitor fidelity at seven levels using explicit thresholds that function both as implementation guardrails and analytic mediators. The Tutor-CogSci shared data system will capture training completion, closing tickets (i.e., session logs), assignment coverage, and design-team leader observations. Quarterly fidelity composites will support local improvement cycles and exploratory mediation analyses linking fidelity to impacts.

Level	Indicator	Threshold
Tutor Training	Tutor certification pass rate	≥85% initial; ≥90% refreshers
Training and Support for Informal Educators at School	Number of informal educators (e.g., instructional aides, librarian, parent volunteers) Completing hub-supported science-of-reading training	≥ 4 caring individuals connected to school complete at least one training per academic year
Parent Support	Number of science-of-reading-focused family literacy events (e.g., parent nights, workshops, or equivalent engagements)	≥ 1 event per year with sign-in logs
Identification & Assignment	Percentage of top-priority students identified by screening assigned a high-impact tutor	100% of top 10 priority students assigned a tutor within 4 weeks of school’s list submission
Dosage	Minimum cumulative hours of tutoring per eligible student matched with a high-impact tutor	≥15 hours per academic year
Quality	Observation ratings on the design-team leader rubric aligned with Science of Reading	≥80% at “meets” or higher
Data Use	Cadence of hub dashboard review by site and team leads (data-to-action cycles)	Monthly (≥ 3 reviews per 10 weeks of scheduled high-impact tutoring)

Using Fidelity Data

The fidelity data will serve three critical purposes related to enabling continuous improvement, understanding impact variation, and offering replication guidance. Monthly fidelity reports will identify sites falling below thresholds, triggering differentiated support. For example, a site with low attendance may receive family engagement resources, while a site with low instructional quality receives additional coaching support. Fidelity data can also enable analyses of implementation-outcome relationships. We will conduct threshold analyses to identify minimum fidelity levels associated with positive impacts, moderation analyses to examine whether fidelity levels moderate treatment effects, and mediation analyses to understand whether specific fidelity dimensions explain outcome variation. Finally, by linking fidelity profiles to outcomes, we will provide evidence-based implementation standards—not arbitrary requirements but empirically validated thresholds for success.

D.4. Design for Information to Guide Replication

Our evaluation design prioritizes generating credible, actionable information that enables successful replication while advancing scientific knowledge about tutoring effectiveness. The evaluation will yield causal evidence of impact and a codified implementation model that guides adoption and scaling in other contexts.

To ensure credibility and transparency, before randomization, we will preregister our study protocol with the ICPSR's Registry of Efficacy and Effectiveness studies (<https://sreereg.icpsr.umich.edu/sreereg/>), and publish our statistical analysis plan, preventing post-hoc decision-making that could bias results. All instruments will undergo testing and pilot validation before use. Analysis code will be version-controlled and made publicly available, enabling complete reproducibility. Upon study completion, de-identified data will be archived with ICPSR, facilitating future meta-analyses and secondary research.

To determine cost effectiveness, we will use the ingredients method (Belfield, Bowden, & Levin 2018) and will comprehensively document all resources required for implementation including personnel costs (tutors, hub coordinators, design-team leaders, training time), curriculum and materials, assessment licenses, etc. The detailed costs will enable state, district, and school leaders to make informed resource allocation decisions and project budgets for local implementation.

Scalability and Sustainability Analysis

The evaluation will examine critical scaling factors of workforce pipeline and infrastructure requirements. For the workforce pipeline we will analyze the tutor recruitment sources, retention rates, and career pathways to inform workforce development strategies. We will document how many tutors are needed statewide (approximately 3,000 for universal coverage of struggling readers) and assess whether the Tutor-CogSci model can supply this workforce. To examine infrastructure requirements we will document the minimum viable infrastructure at school, district, and state levels to guide scaling decisions. This includes datashystems, professional development capacity, and quality assurance mechanisms.

Knowledge Products and Dissemination (from the evaluation)

We will disseminate findings from our study through: (a) Technical report meeting WWC Version 5.0 reporting standards; (b) Peer-reviewed manuscripts for Journal of Educational Psychology, Reading Research Quarterly; and (c) Conference presentations at AERA, SREE, CCSSO and IES Principal Investigators meetings.

Building Evidence for Broader Impact

Our evaluation will contribute to the broader evidence base in several areas. We will contribute to advance understanding of whether and how high-impact tutoring effects demonstrated in small studies can be achieved at scale. By systematically studying a tutoring workforce that integrates university students, high school students, school-based support staff,

and community members, we will provide evidence about sustainable staffing models for educational interventions. The evaluation offers rare evidence about state education agency leadership of evidence-based interventions, informing federal and state policy about appropriate roles and capacities. And finally, the documentation of university-school-state collaboration will provide models for leveraging higher education resources for K-12 improvement.

Through this comprehensive evaluation approach, Indiana will not only determine whether the Tutor-CogSci achieves its intended outcomes but will also generate the knowledge necessary for successful replication nationwide.

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