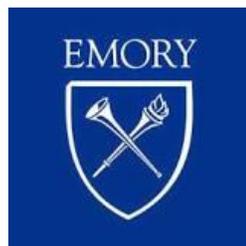
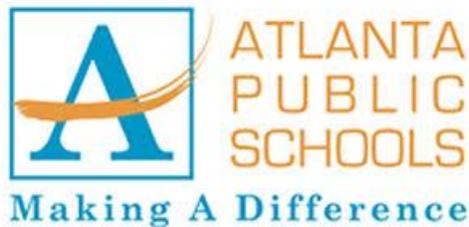


Collaboration and Reflection to Enhance Atlanta Teacher Effectiveness in Mathematics and Science (CREATE-MS) Investing in Innovation Development Grant August 11, 2014



**ATLANTA NEIGHBORHOOD
CHARTER SCHOOL**
helping students learn to use their minds well



"There is no power for change greater than a community discovering what it cares about." - Margaret J. Wheatley



Teachers at a recent Maynard Jackson cluster new teacher induction event

Absolute Priority 1(b): Improving the Effectiveness of Teachers and Leaders

Applicant: Atlanta Neighborhood Charter School

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A. SIGNIFICANCE

Overview: The proposed program, *Collaboration and Reflection to Enhance Atlanta Teacher Effectiveness in Mathematics and Science (CREATE-MS)*, merges an innovative teacher residency model with increased opportunities for teacher collaboration and reflection. The project partners will implement, monitor, evaluate, and disseminate results from a 3-year residency program for new teachers designed to increase student achievement in math and science; decrease teacher attrition; and increase teacher satisfaction and effectiveness. Additional targeted outcomes include equitable access to highly effective math and science teachers for high needs students. Overall, CREATE will enhance the induction experience for **46 new math and science teachers**; support collaboration and deepen reflection of an additional **230 teachers**; and improve the learning of **2,330 K-8 students**.

CREATE project partners include 1) Atlanta Neighborhood Charter School, a K-8 charter school and lead partner on the grant; 2) Georgia State University's College of Education (GSU COE), a college focused on preparing teachers for urban settings; 3) the Center for Education Integrating Science, Mathematics, and Computing (CEISMC), a partnership uniting the Georgia Institute of Technology with educational groups, schools, and corporations throughout the state of Georgia; 4) the School Reform Initiative (SRI), a non-profit organization committed to educational excellence and equity through supporting teachers in Critical Friends Groups (CFGs); 5) the Emory-Tibet Partnership at Emory University (ETP) a center focused on mindfulness to increase resilience in the face of workplace stress; and 6) several charter and traditional public high-needs schools within the Atlanta Public Schools district (including Atlanta Neighborhood Charter School named above as lead partner).

The extent to which the project addresses the absolute priority: The proposed initiative will address ***Absolute Priority 1: Improving the effectiveness of teachers and leaders Subpart***

B: Increasing equitable access to effective teachers for low-income and high-need students.

CREATE aims to “change how schools and classes with high concentrations of high-needs students are staffed and supported” (i3 Register) by: (1) providing an intentionally designed 3-year training ground and support system for new teachers working in high needs schools; (2) significantly changing the teaching structure of the first critical years in the field as a certified teacher; and (3) engaging new teachers in real-world mathematics and science internships.

Designed specifically to “change the operating conditions within schools” (i3 Register), CREATE will engage large percentages of teachers in its schools in CFG work and mindfulness training as the schools work to become support systems for new math and science teachers.

All CREATE schools are part of the Atlanta Public Schools (APS), a high-needs school district located in Atlanta, GA that serves 84% students of color and 75% students eligible for free or reduced-price lunch. Positioning this work specifically within the Maynard Jackson High School (MJ) “cluster” of APS addresses a 2013 needs assessment conducted there that calls for cluster-wide *collaboration within and across schools* (including tackling the charter-traditional school divide) and the cultivation of “*a culture of learning utilizing professional learning communities*”.¹ Focusing on improvements in middle level mathematics and science is also purposeful: recent MJ cluster test data (2010-11) indicate that 84% of students failed the Mathematics end-of-grade test and 73% of students failed the Biology end-of-course test (see Appendix C for additional MJ cluster data and characteristics).

A novel approach to new teacher training and induction: Studies show that there are striking differences in the qualifications of teachers across schools and that urban schools in particular have lesser-qualified teachers.² To address this issue, CREATE proposes an innovative 3-year model designed to retain highly qualified teachers in urban schools that begins in a

teacher's final year of teacher certification coursework, continues through his/her second year of teaching, and includes program components designed to overcome shortcomings typical of teacher induction. These typical shortcomings (and our proposed solutions) are described below.

The traditional student teaching model frequently does not prepare teachers adequately for their entry into the profession.³ First, schools are generally not set up as places for teacher training. Described as the “cross-purposes pitfall,” or the frequent disconnect between the responsibility of teaching and the need for critical reflection on teaching, many student teachers report feelings of frustration and isolation and engage in “survival only” mode.⁴ Adding to this, K-12 field placements are often dictated by cooperating teacher availability and administrative considerations rather than by what is best for the learning of novice *and* the veteran teachers they work with.⁵ Given that research has shown that “quality of preparation often determines the success a teacher has in the classroom...especially in the first few years in their respective roles”⁶, CREATE redesigns student teaching to include a greater focus on reflection and collaboration through the use of “Critical Friends Groups;” *carefully* matched cooperating teachers *and* mentor teachers who are paid and trained for their work; a site-based project director who acts as a liaison between university partners and CREATE schools; and mindfulness training designed to move student teachers beyond “survival only” by building their capacity for flexible thinking.

While *preservice* teacher preparation, including field-based experiences, is a critical component of teacher learning and the CREATE model, *inservice* educators also need innovative induction support. Consider, for example, that nearly half of all new teachers in the U.S. exit the classroom within their first five years.⁷ In urban schools, it only takes about 3 years for half of all new teachers to leave. This rate of turnover has resulted in the number of first year teachers in

classrooms doubling across the last 20 years, a troubling statistic when one considers that a first-year teacher is on average statistically less effective than a third-year teacher.⁸ This high rate of attrition often results from challenging working conditions and the absence of a supportive professional culture. Teachers report poor matches between mentors and mentees, a lack of appropriate training for mentor teachers, and reduced levels of support during the critical second through fourth years of teaching.⁹ This body of research points to the importance of *extending* new teacher induction programs within all schools, and in particular, within high needs schools. Within the CREATE model, Yr2 and Yr3 residents continue to work with mentors and engage in CFG meetings and mindfulness training. We also provide teachers with a gradual increase in responsibilities across all three years in the program as a new teacher works alongside a veteran educator with experience teaching in urban schools in year one (as a student teacher), co-teaches with another resident in year two (as a first-year *certified* teacher), and then takes on sole responsibility of a classroom in the third and final year of the program. Taken together, these inputs work to create a supportive professional culture designed to keep high quality teachers in high-needs schools.

Advancement of theory, knowledge, & practice. CREATE not only draws on literature focused on pitfalls within preservice and inservice teacher education, but also builds on three promising areas of research in teacher induction: (1) collaboration and mindfulness, (2) content knowledge for teachers, and (3) supports for teachers.

Collaboration and Mindfulness. Recent research on student performance in language arts and math has demonstrated positive correlation between student achievement and the creation of a school culture of collaboration and collegiality.¹⁰ Similarly, the development of teachers’ “social capital”—the level and type of interaction and collaboration among teachers—has been

cited as a significant predictor of student achievement gains above and beyond teacher experience or ability in the classroom.¹¹ Adding to this, two recent national surveys found a majority of teachers reporting that collaboration has a positive impact on student achievement.¹² Researchers have also found that collaboration within professional learning communities supports teachers and school leaders in group problem-solving to address teaching challenges¹³; aids teachers in setting student learning goals¹⁴; increases teacher confidence, trust, and voice¹⁵; and builds a sense of collective responsibility for the school and student learning.¹⁶ Drawing on this literature, CREATE has incorporated “*Critical Friends Groups*” (CFGs), a special type of teacher learning community explained in detail in Section B below, into all participating CREATE schools as a support for residents and *all* other teachers. This whole-school design not only benefits individual teachers (including the mentors and other veteran educators working directly with residents) but also builds a school community ready to welcome, train, and support new teachers.

In addition to building a collaborative school culture through CFGs, CREATE also engages teachers in *mindfulness training*. Defined as “the intentional cultivation of moment by moment non-judgmental focused attention and awareness,”¹⁷ mindfulness practice involves the calm acknowledgement and acceptance of one’s thoughts, emotions, and physical sensations. For teachers, mindfulness interventions have been shown to counter components of burnout such as depersonalization, emotional exhaustion, and a sense of low personal accomplishment and also improve classroom climate and teacher-child relationships.¹⁸ Given a recent report of job-related stress among teachers,¹⁹ we believe that mindfulness training -- specifically cognitively-based compassion training (CBCT) developed at Emory University -- can lead to a healthier and more stable teacher workforce.

Content knowledge for teachers. One thing that we know in education is that teacher quality matters.²⁰ In fact, recent findings point to four key dimensions of teacher quality: teaching experience, professional certification, content knowledge, and overall academic ability.²¹ Surprisingly, many teacher residency programs focus solely on recruiting candidates with strong academic backgrounds rather than considering each of the four dimensions equally. Researchers have warned, however, that “policies designed to...encourage [only] the ‘brightest’ into the teaching profession” may be flawed, arguing that “*subject matter knowledge* and teaching skills acquired during teacher education programs matter as well.”²² Drawing on this literature, CREATE recruits preservice teachers who are already preparing to graduate and work in urban schools, providing them with avenues for continued growth in content and pedagogical knowledge over the course of the three year residency. Based on research that links teachers’ participation in content-based research internships with decreased teacher attrition and increased student achievement,²³ CREATE engages all new teachers in carefully designed **7-week summer internships with scientists in the field of mathematics and science** at Georgia Tech (GT) in order to increase teachers’ content and pedagogical knowledge while developing relationships for ongoing learning with GT faculty.

Support for teachers. The literature on teacher induction programs suggests that a system of internal and external supports during the first several years of teaching is vital to keeping early-career teachers teaching and teaching *effectively*.²⁴ Formal and informal mentorship, in particular, has been shown to increase teacher reflectiveness (and levels of satisfaction) across the teaching career²⁵ and, additionally, to increase student achievement of those teachers working with a mentor.²⁶ Veteran educators also appear to benefit from becoming mentors as they take on new leadership opportunities and improve their own classroom practices.²⁷ Drawing on this

literature, CREATE carefully pairs new teachers with **multiple mentors who are trained** in the areas of adult learning and cognitive coaching in order to enhance residents' (and their own) instructional methods and impact on student achievement.

In addition to the benefits of working with mentors, recent studies have found that opportunities for collaborative or paired-teaching during both preservice training and induction years helps build pedagogical skill among new teachers.²⁸ In reportedly successful models, both teachers in a collaborative pair are equal partners, working together as lead teachers to achieve more thoughtful planning, greater differentiation in instruction, and more individualized attention for each child. As such, CREATE has proposed a **3-year system of scaffolded inputs** designed to support early career teachers with collaborative teaching structures across varied roles as their responsibilities increase each year, including a paired-teaching experience in Year 2.

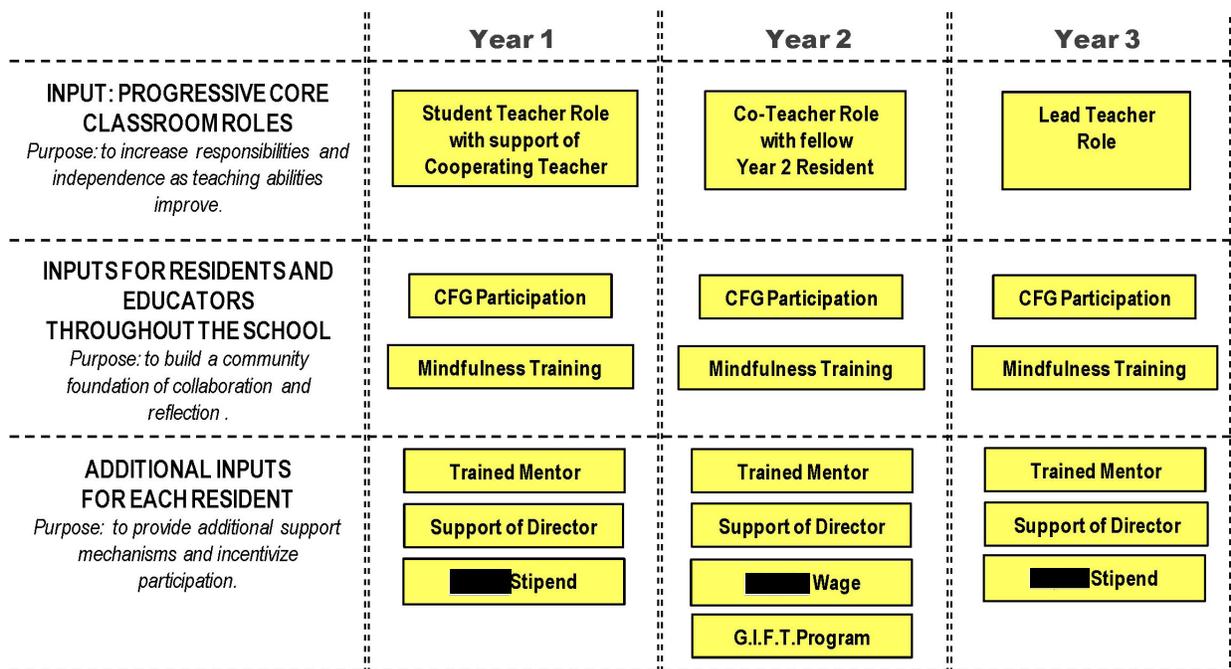
The potential contribution of CREATE to theory, knowledge, and practice. Results from the CREATE initiative will advance knowledge and understanding in the fields of preservice teacher education, teacher induction, and university-school partnerships. More specifically, results will (1) enhance our understanding of carefully structured field experiences that result from innovative school-university partnerships; (2) delineate affordances and constraints of newly designed student teaching/co-teaching models for the critical first two years in the field; and (3) add to our understanding of the impact of mentorship, CFGs, teacher research internships, and mindfulness training on retention, overall satisfaction, and effectiveness of new math and science teachers in urban settings. CREATE will not only serve as an exemplar for new practices across an entire 3-year residency program, but will also inform teacher training and induction supports within each of the critical preservice and induction years targeted in the grant. Results will be shared locally at district meetings and state and regional conferences;

presented nationally at conferences such as the Association of Teacher Educators (ATE) and the American Educational Research Association (AERA), and disseminated through international publications such as the *Journal of Teacher Education*.

B. QUALITY OF PROJECT DESIGN

The clarity and coherence of the program and its targeted outcomes. CREATE program structure, activities, and outcomes are fully detailed in the program structure diagram (figure 1 below) and the CREATE logic model (figure 2, p. [redacted]) and corresponding narrative below. The program structure diagram outlines the 3-year experience of residents and associated inputs.

Figure 1. Program structure



Input - Progressive Core Classroom Roles: As residents move through the 3-year residency model their role within the classroom changes. GSU students enter the CREATE residency for the final year of their teacher certification program. These Year 1 (Y1; student teacher) residents are placed at Atlanta Neighborhood Charter School (ANCS), Wesley International Academy (WIA) or a traditional public school in the MJ cluster for their practicum

experience. Supports are substantial as residents work in the classroom of an experienced cooperating teacher to observe, teach small groups, lead whole class sessions, and complete their university requirements. Upon graduation from their GSU teacher certification program, Y1 residents continue on as Year 2 (Y2; co-lead teacher) residents at a CREATE school. These Y2 residents are purposefully paired with each other as co-teachers who plan, teach, and reflect *together*. The lighter load and flexibility of having two teachers in one classroom allows more time for mentor-resident reflection and observations of other teachers. This arrangement is also intended to address the sense of being overwhelmed with new responsibilities that new teachers often cite as the reason they leave teaching. Finally, in Year 3 (Y3; sole lead teacher) residents become lead teachers in their own classrooms after having 2 years of supported co-teaching experiences. A major component of the CREATE design, these progressive core classroom roles provide critical supports for residents while also providing space for increased autonomy, agency and independence each year.

Input - CFG: As described above, CREATE residents are placed at ANCS, WI, or another “readied” CREATE school within the MJ cluster that has prepared itself for the arrival of residents by building a culture of collaboration through engagement in the powerful work of Critical Friends Groups (CFGs). In CFGs, educators gather together to discuss student work, educator work (such as unit plans or rubrics), and dilemmas of practice. The training schools for Y1 residents will do the advance work of sending teams of teachers to learn together at a summer CFG institute and/or the SRI winter meeting. While CFGs will ultimately be offered as a form of professional development for all teachers at all CREATE schools, the Y1 residents themselves will be placed in a CFG comprised solely of Y1 residents. Y2 and Y3 residents will continue the work of CFGs, but as part of a mixed group of educators at their placement schools. This

ongoing monthly intervention for all residents is designed to enhance pedagogical skills and build and sustain support networks for teachers.

Input - Mindfulness: Acknowledging that negative collegial and student relationships can diminish a teacher's energy for teaching, all residents will also engage in regularly scheduled "mindfulness" classes throughout their residency. Mindfulness builds emotional regulation through enhanced executive function (such as paying attention) and flexible thinking, thereby leading to improved relationships and classroom climate. The veteran educators at all schools will have the opportunity to engage in these trainings as well.

Input - Multiple Forms of Mentorship: CREATE residents are offered multiple layers of mentorship across all years of the residency. Different from traditional student teaching models, where conflicts with mentors might leave student teachers "lost at sea",²⁹ CREATE Year 1 residents are mentored by: a cooperating teacher (CT) with whom they share a classroom and interact daily; a mentor teacher outside of their placement classroom with whom they meet at least twice monthly; and a project director who acts as a liaison between GSU, the residents, the veteran educators, and participating schools in the cluster and is called upon as needed. Y2 and Y3 residents continue this mentorship work with their assigned mentor and the project director. All veteran educators who provide mentorship described above opt into the work (no veteran educators are required to take on the work of mentoring) and are trained and paid for the time they spend as CREATE veteran educators. An application and interview process for residents and CTs enables the project director and school principals to identify the "best fit" pairings.

Input - GIFT: In order to ensure that the teacher residents are also building content knowledge, Y2 residents work as paid summer interns in the Georgia Intern Fellowships for Teachers (GIFT) program. As GIFT Fellows, Y2 residents "experience how industrial scientists

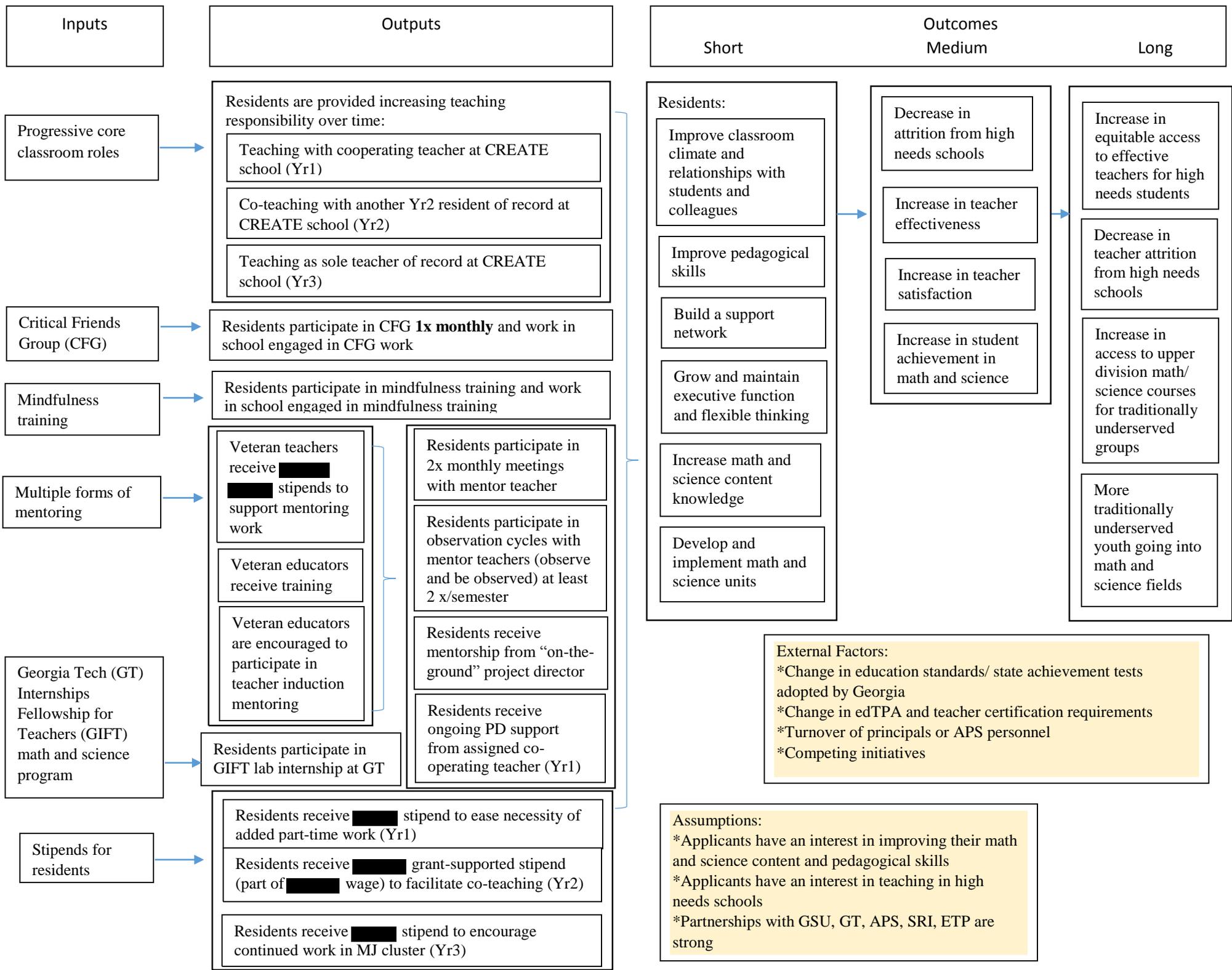
approach problems, design experiments, interpret data, and communicate findings”

(<https://www.ceismc.gatech.edu/GIFT>); have opportunities for hands-on engagement with math and science content; and receive support from Georgia Tech professors for developing integrated math and science curricula for use in their shared classrooms. It is expected that the professors who host the resident interns will extend the collaboration throughout the Y2 co-teaching experience. The GIFT professors will also be invited to join a CFG at their Y2 resident’s school, learning about curriculum implementation and reflecting on teaching alongside the residents with whom they worked the previous summer.

Input - Stipends for Residents: Stipends throughout the induction period are offered to all residents. Y1 residents receive [REDACTED] to offset tuition costs and reduce the need for part-time work outside of their student-teaching field experiences. Y2 residents are paid a cumulative wage of [REDACTED] (through a [REDACTED] stipend from the grant, a [REDACTED] stipend from their CREATE school, and [REDACTED] for their GIFT internships), earning a salary comparable to other first-year teachers in APS [REDACTED] while benefiting from the opportunity to share a classroom and teaching responsibilities with another resident. This financial arrangement is also appealing to the schools where Y2 residents are placed; the schools are gaining two first year teachers for less than the price of one and the teacher-to-student ratio in those classrooms will be lower, allowing for more personalized instruction. Finally, in spring of their co-teaching year, residents are supported in securing positions as lead math or science teachers at a CREATE school for their third year of residency, very possibly at the same school where they completed their co-teaching Y2 experience. Different from other residency models, Year 3 residents are offered a [REDACTED] stipend if they remain a teacher at a MJ cluster school (instead of having to pay back stipend money if they decide to leave). This is purposeful--we want highly qualified residents to accept

jobs in CREATE schools because they *want* to work in these schools and not because they feel financially obligated to stay. Continual teacher turnover in CREATE and other urban schools leads to low social capital and obligating teachers to work there who would rather leave would undermine the work of the CREATE program.

The CREATE project goals are to increase student achievement and engagement in math and science; decrease teacher attrition from high-needs schools; and increase teacher satisfaction and effectiveness. The logic model (p. 15) summarizes the 6 project inputs and associated outputs described above (columns 1 and 2) and additionally outlines targeted short-term outcomes for teachers and medium and long term outcomes for teachers *and* students (column 3). Short term outcomes for residents include improving classroom climate and relationships with students and colleagues; improving pedagogical skills; building a support network; growing and maintaining executive function and flexible thinking; increasing math and science content knowledge; and developing and implementing math and science units. Medium term goals target both teachers *and* students, with goals for teachers including decreased attrition from high needs schools and an increase in teacher effectiveness and satisfaction, while goals for students include increased achievement in math and science. Finally, long term goals are focused mostly on students: an increase in equitable access to effective teachers, an increase in access to upper division math and science courses, and more students going into math and science fields. Additionally, long term goals for teachers include a decrease in teacher attrition. While it is tempting to match individual inputs and outputs with project outcomes, we refrain from making those direct matches. Instead we view the CREATE model inputs as interacting supports and structures that collectively, and through overlapping mechanisms, contribute to the short, medium, and long term outcomes of the project.



Identification of potential risks to project success and steps to mitigate those risks. One potential risk to project success is teacher resistance to CFG work. This opposition tends to grow from teachers’ prior experiences with ineffective professional development initiatives that has resulted in a desire to guard their time. To counter this effect, CREATE personnel will work with school administrators *and* teachers to find a mutually acceptable schedule and principals will be encouraged to offer opportunities for other professional development. CFG summer institutes will be scheduled to maximize convenience and will include stipends to encourage attendance.

A second potential risk to project success is the difficulty of coordinating schedules for mentor trainings and meetings. This ever-present challenge is likely to be exacerbated by the fact that different schools use different schedules and principals vary in their scheduling flexibility. To mitigate potential conflicts, in 2016-17 and 2017-18, when the residents and their mentors span multiple schools for the first time, there will be three project implementation personnel on-hand across schools to maximize CREATE’s ability to schedule with all teachers needs in mind. Other external factors and assumptions are included in the logic model on p. 15.

C. QUALITY OF MANAGEMENT PLAN AND PERSONNEL

Key responsibilities, objectives, and performance targets. The CREATE advisory team--consisting of Project Director, Project Coordinators, researchers, a representative from each Atlanta Public School, Georgia State University, CEISMC, School Reform Initiative, and the Emory-Tibet Partnership--will meet monthly throughout the duration of the grant period to manage the development and implementation of the project. In addition to those monthly team meetings, table 1 below outlines major milestones in the management of the project.

Table 1. CREATE Milestones Project Director = PDir; Project Coordinator =PCoor

Milestone	Responsible Party	2015-16 SY	2016-17 SY	2017-18 SY	2018-19 SY
Hire Project Coordinator	PDir & CREATE	Spring prior to			

	advisory team	SY start			
CREATE implementation retreat to develop project	PDir & PCoor	Spring prior to SY start	Spring prior to SY start	Spring prior to SY start	
CREATE advisory team meetings	PDir	Monthly during SY	Monthly during SY	Monthly during SY	Monthly during SY
Recruit and select Y1 residents	PDir & PCoor	Spring prior to SY start	Spring prior to SY start		
Select and train mentors, CTs, and CFG coaches	PDir & PCoor, School Leaders & SRI consultants	Spring/summer prior to SY start			
Form Y1 resident CFGs	Project Director	Fall	Fall		
Offer CFG institute trainings to prepare schools to receive residents	PDir & PCoor and SRI consultants	Summer prior to SY start	Summer prior to SY start	Summer prior to SY start	
Form CT - resident pairings	PDir & PCoor, School Leaders, & SRI consultants	Summer prior to SY start	Summer prior to SY start		
Mentor - resident meetings	PDir & Mentors	Regularly during SY	Regularly during SY	Regularly during SY	Regularly during SY
Mindfulness training for residents & other teachers	PDir & ETP	Fall/spring	Fall/spring	Fall/spring	Fall/spring
Veteran educators attend SRI Winter Meeting	PDir & SRI	Winter	Winter	Winter	Winter
Prepare Y1 residents for transition to Y2 - determine school placement site and co-teaching partnerships	PDir, PCoor & School Leaders	Spring	Spring		
Rising Y2 residents participate in math/science internship	PDir & CEISMIC at Georgia Tech		Summer prior to SY start	Summer prior to SY start	
Prepare Y2 residents for transition to year Y3 role as lead classroom teacher	PDir, PCoor & School Leaders		Spring	Spring	
CREATE year-end retreat with all partners to review progress from year	PDir & PCoor	Summer following SY	Summer following SY	Summer following SY	

Project Assessment. The CREATE implementation team will assess progress towards annual performance targets in a variety of areas outlined in table 2. For each annual target, the baseline will be established based on data from the 2014-15 school year prior to implementation.

Table 2. Performance targets

Annual Performance Target	Data Collection Method	Periodic Progress Monitoring for Target
Increase overall teacher effectiveness for residents as they proceed through the residency (baseline established for each resident in year 2 of residency)	TAPS component of TKES from final summative evaluation for each resident in years 2 and 3 of residency as measured by Georgia Department of Education guidelines (evaluations completed by TKES credentialed administrators at each CREATE school site)	TAPS component of TKES in mid-year formative evaluation for each resident as measured by Georgia Professional Standards Commission guidelines (evaluations completed by TKES credentialed administrators at each CREATE school site)
Decrease annual teacher attrition from CREATE school sites (baseline established for each school site in year immediately preceding involvement as CREATE site)	Teacher attrition data collected from each school in July annually	Mid-year surveys to teachers at CREATE school sites asking about intentions to return to school for following school year
Increase overall teacher satisfaction (baseline established for each school site the year prior and in first year of involvement as CREATE site)	Average of results from quarterly teacher satisfaction surveys taken over course of each school year	Results from each individual quarterly teacher satisfaction survey
Increase overall teacher attendance (baseline established for each school site in year immediately preceding involvement as CREATE site)	Annual average daily teacher attendance data collected from each school in July annually	Quarterly average daily teacher attendance data collected from each school
Increase student achievement in math and science (baseline established for each school site in year immediately preceding involvement as CREATE site)	Average mean scale score on Scantron Global Performance Series (or other single district wide test) in Math in grades K-2 Average mean scale score on Georgia Milestones Tests (or other single statewide test) in Math and Science for each school in grades 3-8	Data from fall and winter administrations of Scantron Global Performance Series (or other single district wide test) in grades K-8

The adequacy of procedures for ensuring feedback and continuous improvement. The CREATE advisory team will analyze the periodic progress-monitoring data and qualitative research conducted throughout the project during its monthly team meetings and make program adjustments and improvements as needed. The GSU research team will mitigate problems by communicating interview, focus group, and observational findings (anonymously) to the team.

Additionally, the TES survey used by the evaluator (details below in section D) will provide formative feedback so that the entire team, including representatives from all the different collaborating entities, can examine and address other issues as they arise. During the annual CREATE implementation retreat, performance relative to annual targets will be evaluated and adjustments made as needed to insure the success of the project in meeting its goals.

The extent of the demonstrated commitment of key partners and evidence of support.

CREATE represents a powerful collaboration across education sectors (district/charter, K-12, higher education) in Atlanta with a common commitment to improving teachers’ capacity to affect higher levels of learning in their students. Letters of support and in-kind commitments from each of these collaborators can be seen in Appendix J.

Table 3. Collaborator Commitments

Partner	Overview of Commitment
Atlanta Neighborhood Charter School	<ul style="list-style-type: none"> - serve as site for training residents - participate in selecting CTs, mentors, CFG coaches, placement of residents - designate individual for CREATE advisory team meetings - send teams to CFG summer institutes
Wesley International Academy	<ul style="list-style-type: none"> - serve as site for residents - participate in selecting cooperating teachers, mentors, CFG coaches, and placement of residents - designate individual for CREATE advisory team meetings - send teams to CFG summer institutes
Atlanta Public Schools	<ul style="list-style-type: none"> - provide additional schools to serve as sites for residents - support principals at school sites in: selecting cooperating teachers, mentors, CFG coaches, and placement of residents - designate individual for CREATE advisory team meetings - send teams from APS schools to CFG summer institutes
Georgia State University	<ul style="list-style-type: none"> - designate individual for CREATE advisory team meetings - provide faculty to lead qualitative data collection and analysis - work with project director on field placements and student teaching requirements for year 1 residents
The Center for Education Integrating Science, Mathematics, and Computing at Georgia Tech	<ul style="list-style-type: none"> - facilitate summer internships for residents in GIFT program - engage GIFT professors in ongoing work at CREATE schools overseeing implementation of curriculum - identify math/science professors interested in participating in school CFGs - designate individual for CREATE advisory team meetings

School Reform Initiative	<ul style="list-style-type: none"> - provide support to implementation of CFGs through CFG national facilitators, including running summer CFG institutes - provide scholarships for individuals from CREATE school sites to attend SRI Winter Meeting annually - designate individuals for CREATE advisory team meetings
Emory-Tibet Partnership	<ul style="list-style-type: none"> - facilitate mindfulness training for residents & teachers at CREATE school - designate individual for CREATE advisory team meetings

Project Director—Elizabeth Hearn, Ed. S., Director New Teacher Residency Project (NTRP): Elizabeth brings several years of experience as a researcher at Harvard Medical School and Emory University’s Department of Psychiatry together with 14 years of experience teaching middle school science to her work as the project director. She has also been the project director for the \$1M Race to the Top - Georgia Innovation Fund grant awarded in 2012 that developed the New Teacher Residency Project (NTRP; a pilot study), which has exceeded its goals for the development, support, and retention of new K-8 teachers. Elizabeth met 100% of accounting and efficacy reporting deadlines for the Governor’s Office of Student Achievement (GOSA) and has met all program objectives under budget. See appendix G for a letter of support from GOSA that specifies Mrs. Hearn’s stellar record.

D. QUALITY OF PROJECT EVALUATION

Overview of the Evaluation. Empirical Education will conduct the evaluation for this project. Empirical has extensive experience conducting large-scale, rigorous, experimental and quasi-experimental impact evaluations as well as formative and process evaluations and is currently leading three evaluations for i3 2010 (validation), 2011 (development), and 2012 (development). Vitas for Empirical the evaluation team are included in Appendix F. The evaluation will apply mixed methods to assess the key components of the logic model, including *presence of inputs*, such as participation in CFG and multiple levels of mentorship; *impacts on proximal and intermediate outcomes*, such as improved pedagogical skills for teachers; *impacts*

on distal outcomes, such as teacher retention and students’ achievement in math and science; and mediating effects of specific intermediate processes on the distal outcomes.

The program evaluation will assess the impact of CREATE on approximately 50 teachers and their students. Outcomes will be compared to matched cases not receiving the intervention. Confirmatory impacts will be assessed in Years 2-4. The basic roll-out of the program is below.

Table 5: Program Roll-out

School Year	2015/16 Year 1	2016/17 Year 2	2017/18 Year 3	2018/19 Year 4
Teacher Cohort 1 (N~18)	Yr 1 residency Outcomes: -Surveys -Pride Teaching Environment Survey (TES)	Yr2 residency Outcomes: -Surveys -ACHIEVEMENT* -Teacher effectiveness -TES	Yr 3 lead teacher residency Outcomes: -Surveys -RETENTION* -TES	
Teacher Cohort 2 (N~28)		Yr 1 residency Outcomes: -Surveys -TES	Yr 2 residency Outcomes: -Surveys -ACHIEVEMENT* -Effectiveness -TES	Yr 3 lead teacher residency Outcomes: -Surveys -RETENTION* -TES

*Outcomes used in confirmatory impact analyses

As seen in Figure A, 18 new teacher candidates join the residency program in 15/16 (Cohort 1) and 28 join in 16/17 (Cohort 2) (a new training school will be added in 16/17, resulting in more teachers.) Impacts will be assessed only on Cohorts 1 and 2 given the length of the program, the period of the grant, and the time required to conduct analysis. Impacts on achievement and teacher effectiveness will be assessed after two years (Spring 16/17 for Cohort 1 and Spring 17/18 for Cohort 2, with results combined across cohorts), while impacts on teacher retention will be assessed after three years. (It will not be possible to assess impacts on teacher effectiveness and achievement after three years for the combined Cohort 1 and 2 sample given that outcomes for Cohort 2 will not be available until 4-5 months before the end of the grant.) From January through August 2015, Empirical will work closely with the program developers,

APS, Georgia State University College of Education (GSU COE), and other partners to provide preliminary feedback concerning the development of program inputs and to mobilize the data collection processes. ***The implementation study*** will span the length of the grant and, consistent with the requirements of the National Evaluation of i3, will establish measurable indicators of implementation for each key program component (see inputs in the logic model, Figure 2), as well as thresholds for assessing fidelity of implementation. The indicators and criteria, thus established, will be used with the impact evaluation to provide feedback concerning fidelity of implementation. Additionally, researchers at GSU will conduct a qualitative study to inform project implementation on a bi-annual basis and provide context for interpretation of the impact study. Qualitative research questions will be continuously evolving, but initial questions include:

1. *What are the experiences of teacher residents, veteran educators, and other teachers and administrators at CREATE schools during the 3-year residency cycle?*
2. *According to residents and administrators, what are benefits and drawback of CREATE?*
3. *How well do schools and non-profit partners work together to implement CREATE?*

The GSU research team will observe and document various components of CREATE including CFG meetings, mentor trainings, GIFT internships, and mindfulness trainings. Focus groups will be conducted twice annually with resident participants and non-participant groups. The GSU research team will also conduct focus groups with mentors, CTs, and CFG coaches. Finally, key informant interviews will be conducted with CREATE staff and school personnel on an annual basis. Finally, program participants may be invited to participate in more frequent interviews and observations for the purposes of more closely documenting the experience of residents.

The impact study will use a nonequivalent comparison group design³⁰ to estimate regression-adjusted average impacts of the program. The primary research questions are:

1. *Is there a positive impact of the Collaboration and Reflection to Enhance Atlanta Teacher Effectiveness (CREATE) program on retention of novice teachers three years after the start of the teacher induction program?*

2. *Is there a positive impact of the CREATE program on achievement of students of novice teachers in mathematics and science in grades 3-8, as measured by the Georgia Milestones Assessment System?*

Additional secondary questions will examine: (a) CREATE's impact on teacher effectiveness, as measured by Teacher Assessment of Performance Standards (TAPS) scores, (b) CREATE's impact on teacher-reported levels of satisfaction, motivation, efficacy, support, and short and long-term career intention (TES survey), (c) whether student's pretest and socio-economic status (measured by eligibility for free/reduced price lunch) moderate impacts on student achievement, and (d) whether impact on teacher effectiveness mediates subsequent impact on achievement.

The outcome measures: The evaluation relies on several key sources of data, utilizing, where available, established, reliable, and previously validated instruments, as well as teacher survey responses. (We describe the outcome measures and their psychometric properties, where available, in Appendix J). *Teacher retention* will be assessed for the full K-8 teacher sample based on whether a novice teacher is actively teaching by the end of the third year of the program. We will supplement direct counts of retention with the Pride Teaching Environment Survey (TES) because it assesses factors shown to be related to the likelihood that a teacher will remain in the education profession, including: levels of teacher satisfaction, motivation, self-efficacy, support, career goals and intentions, school climate, and the teaching experience.³¹

Student achievement in math and science will be assessed in grades 3-8 using the Georgia Milestones Assessment System (commitments for provision of data can be seen in Appendix G, pp. 1 and 4). It is not known at this time whether this test will be vertically scaled. If it is not, outcomes will be z-transformed within-grade and analyzed together. Psychometric properties of the instruments are not yet available. *Teacher effectiveness* will be assessed using ratings on the TAPS dimensions, including professional knowledge, instructional strategies, and creating a positive learning environment. Additional surveys will be deployed to CREATE residents and

comparison group teachers about supports in Y1, collaboration and mentorship activities.

Power analysis: We assume 46 CREATE teachers at baseline (Cohorts 1 and 2 combined), that three teachers will be lost in each of the three years; and 200 matched controls at baseline (Cohorts 1 and 2 combined), with 24 lost in each of the three years. This reflects expected different retention rates in the two conditions. We calculate minimum detectable effect size (MDES) for impacts on achievement (after 2 years) and teacher retention (after 3 years).

Achievement: we obtained parameter values (R-squared, and ICC) from Hedges and Hedberg,³² Xu and Nichols,³³ and Westine, Spybrook and Taylor.³⁴ We assumed a conservative value for the ICC of .19, a cluster(teacher)-level R-squared of .70, a student-level R-squared of .40, and 25 students per teacher. Limiting to grades 3-8, and figuring in attrition, results in 27 treatment and 101 control teachers after 2 years. Assuming power of 80% and Type-1 error of .05, and using equation 4 (p. 34) from Bloom, Richburg-Hayes, and Black,³⁵ with a harmonic mean of 43 teachers per conditions, the MDES for impact on achievement is .18 standard deviation units – which is a plausible magnitude given an intensive 2-year treatment. Retention: Given the assumptions stated above about rates of teacher attrition in the two conditions, power to detect the difference between conditions in proportion of teachers retained after 3 years is 74%. (This is slightly lower than the preferred level of power of 80%, but is the best possible given available sample sizes and assuming realistic rates of teacher attrition over three years.) The TES survey will supplement this result by allowing assessment of impact on variables that are predictive of longer-term retention. With the resources of the grant, implementation of the program is limited to five to seven schools. Given the relatively small school N, we will treat schools as a fixed effect and model sampling variation at the teacher level, which is reflected in the power analysis.

The quasi experimental design: The matched comparison group will be drawn from the

pool of candidates also receiving teacher induction training through GSU but who are not part of CREATE (participants in the standard teacher certification program). Teachers in the traditional program are expected to have similar backgrounds and teaching aspirations as those in CREATE. GSU expects approximately 28 candidates to enter CREATE annually (18 the first year) and 100 per year to enter the traditional program. A teacher survey will be administered at baseline to all teacher candidates applying to the GSU COE certification year and will include questions about candidates' college major and GPA, prior science and math training, comfort level with teaching math and science, and motivations for entering the teaching profession. Using responses to the baseline surveys, we will use propensity score matching (subclassification, one-to-one matching with replacement) to identify the matched comparison group of teachers (methods described in Dehejia and Wahba³⁶ and Bloom, Michalopoulos and Hill³⁷). A logistic regression model will be used to generate estimated propensity scores. Various researchers have pointed out that the quality of covariates used for matching makes a bigger difference in avoiding selection bias than the specific matching algorithm.³⁸ In particular, matching on “productive covariates” that reflect individual interests and motivational characteristics – such as the ones measured with the baseline survey – is critical for limiting selection bias.³⁹ After the matched comparison group is identified, the teacher N's in each group will serve as the “baseline” numbers used to assess teacher retention/attrition over the next three years. We expect treatment teachers to be placed in APS CREATE schools and controls to be placed in other APS schools, with some going to districts elsewhere in the state. School demographic data (e.g., Title 1 status, proportion of students on free/reduced lunch, school-level pretest and other characteristics) will be collected from the state student data system to compare the characteristics of schools in the two conditions.

Analysis: Implementation and achieved relative strength: To answer questions about

implementation, the research team will assess both intervention fidelity and achieved relative strength of the intervention-control contrast.⁴⁰ Intervention fidelity indexes the extent to which the program model is faithfully reproduced at project sites and requires data only from treatment group. Achieved relative strength refers to the degree to which the intervention model, in practice, differs from the supports and pedagogical model(s) underlying the business-as-usual comparison condition and, therefore, requires equivalent data from both treatment and comparison groups. Use of additional mentor teachers, site-based project directors, mindfulness training, and participation in CFG and GIFT are characteristics of the treatment but not the control group, indicating a strong treatment-control contrast. It will be meaningful to compare the level of support and collaboration that teachers in both groups receive/ participate in.

Analysis of primary research questions: With the subclassification approach, we will create five subclasses based on the quintile distribution of estimated treatment group propensity scores, and conduct specification tests to assess balance within subclasses on covariates until an adequate number of strata is arrived at (see Michalopoulos, Bloom and Hill⁴¹ for full description of method.) We will then conduct within-stratum regressions and take a weighted sum over the strata to arrive at average impact estimates (weights being set to the proportion of treatment teachers in each stratum). For teacher effectiveness we will use linear regressions with TAPS scores as the outcome variable and teacher characteristics (baseline survey responses), student demographics (class and school level), and student background variables (class averages of pretest) as covariates. For student achievement outcomes, we will regress individual student scores against the indicator of treatment status, student covariates (e.g., pretest), and teacher covariates (e.g., baseline survey responses); also, we will include a teacher random effect to adjust for clustering of students in teachers. In the analysis of retention, logistic regression will

be used to estimate the log odds of retention in the teaching profession in each condition, as well as a difference between conditions in the probability of retention, three years after entry into the GSU induction program (outcomes: 1=retained, 0=not-retained) with the same covariates as above. Fixed effects will be used in all impact analyses to indicate school membership. (The model specifications for estimating impacts on achievement and retention are included in Appendix J). *Other analyses*: Differential impacts will be assessed by adding a term for the interaction between the indicator of treatment status and the hypothesized moderator to the regression model. We will examine the moderating effects of student attributes (pretest and eligibility for free or reduced price lunch) on impacts on achievement. We will assess whether impact on teacher effectiveness mediates impact on achievement. Mediator analyses will be conducted within a multilevel framework.⁴² We will also use a principal stratification approach to assess the mediating processes.⁴³ Software used to conduct the mediation analyses will include *Remediation*⁴⁴ and *mediation* in R.⁴⁵ Researchers will also use approaches for estimating impact under conditions where the program is adequately implemented⁴⁶ that build on the literature on program-related subgroups.⁴⁷ Researchers will also conduct a series of sensitivity analyses to test robustness of benchmark impact estimates for the primary research question, including the use of simple alternatives such as hierarchical models to estimate impacts on the treated and matched comparison group. If treatment and comparison teachers are placed in schools that have very different compositions, we will test whether impacts replicate when we limit the teacher samples in both conditions to very similar schools, if the sample size allows. We do not expect control teachers to be placed in CREATE schools or treatment teachers to be placed in non-CREATE schools; however, we will monitor for this, document occurrence, and apply Local Average Treatment Effect (LATE) analyses to address the problem of crossovers should it arise.⁴⁸

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