Georgia Residency for Educating Amazing Teachers (GREAT)

Introduction

"Teachers are not 'finished products' when they complete a teacher education program. Strong residency and mentored induction experiences during their initial years in the classroom provide beginning teachers with invaluable support as they lay the groundwork to become accomplished teachers, A well-planned, systematic induction program for new teachers is vital to maximize their chances of being successful in any school setting."

National Commission on
Teaching and America's Future, 2003, page 20

The Georgia Residency for Educating Amazing Teachers (GREAT) will address the Absolute Priority for the Teacher Quality Partnership Grant by creating a partnership including the Southern Regional Education Board (SREB); Georgia College and State University (GCSU); and at least six high-need districts served by the Oconee Regional Education Service Agency (RESA). The partnership will produce three cohorts each with 20 residents (a total of 60 new teachers) who will be trained and will commit to serving as middle school science, and mathematics teachers in their sponsoring districts for a minimum of three years after completion of their year-long residencies. They will earn a Master of Arts in Teaching (M.A.T.) degree from GCSU by completing an 18-month, 54-credit online program. While earning their degree the resident will complete a full-year residency at a middle school in their sponsoring district under the guidance of a highly-skilled mentor and expert coach. Upon successful completion of the residency, participants will be employed in a middle school where the district will also provide two years of induction support, including mentoring and ongoing face-to-face instructional coaching.

The GREAT project addresses **Competitive Preference Priorities 1 (STEM focus) and 2 (novice applicants).** The STEM competitive preference priority is met by (1) selecting candidates with bachelor's degrees and/or work experience in STEM fields; (2) a math and science focus in GCSU coursework; (3) a STEM and project-based learning (PBL) focus in instructional coaching; (4) their residency placement in math or science classes under a skilled teacher-mentor; and (5)

specific enrichment learning opportunities for computer science and coding, with a goal that one-quarter of the residents will earn the Georgia Professional Standards Commission's (GaPSC's) new certificate endorsement in teaching computer science. The novice applicant priority is met by virtue of the fact that neither SREB or GCSU has been awarded any qualifying federal funding in the five years prior to this proposal submission.

A. Project Design

(A1) GREAT demonstrates a rationale and need for STEM Middle School Educators

It is not hyperbole to say that America will be eclipsed by other countries if it does not strengthen the STEM skills of our citizens and workforce. A weak point in developing STEM skills can be found in middle grades education. Middle grades students without exposure to STEM or development of skills in science and math will be unlikely to enroll in and even less likely succeed in advanced math and science classes, computer science classes, and AP and dual enrollment courses in STEM subjects. It is doubtful that high school students without strong science and math skills will be well-prepared for STEM studies in college.

A National Science Board survey in 2011-12 showed that while 90 percent of high school math and biology teachers have a degree in their teaching field, only 74 percent of middle school science teachers have a science degree, and only 67 percent of middle school math teachers have a math degree. A Learning Policy Institute analysis of Title II data indicates there is a perennial shortage of math and science teachers. The hiring of teachers in the United States is less selective than in many Organisation for Economic Cooperation and Development (OECD) countries that outperform it on international assessments. Because the hardest-to-staff subjects are usually math and science, when a district struggles to attract teachers it also tends to struggle in math and science student outcomes, as has happened in our partner districts (see Table 1). The findings of

the 2015 Programme for International Student Assessment showed that American students attending less advantaged schools received 30 hours less science instruction than their more advantaged peers, and scored on average 91 points lower on the assessment (OECD, 2016). GREAT is intended to address that disparity in our partners district.

The Oconee RESA (representing the partner districts) will work with SREB and GCSU in this partnership in response to teacher recruitment and retention challenges facing the region. GCSU's online MAT program enrolls students from across Georgia, and SREB also operates throughout the state. Other districts and RESA's will be recruited for the second and third cohorts, but because GCSU is located in the Oconee RESA region and has relationships with those districts, recruitment for the first cohort will begin with (but not be limited to) the Oconee districts.

Table 1: High-Need Indicators of Districts in Georgia's Oconee Service Area

District/School	SAIPE Poverty Rate[a]	School FRPL	Teacher retention (GA median = 87.6%)	% MS Teachers w/ Emergency Waivers[c]	Proficiency (GA = math 43.1; science 41.1)[d]
Baldwin/Oak Hill M.S.	31%	92.86%	78.0%	7%	M: 17.2% S: 21.7%
Hancock/Hancock Central M.S.	40%	>95%	80.9%	48%	M: 7.8% S: 17.0%
Johnson/Johnson County M.S.	31%	90.37%	82.4%	7%	M: 44.2% S: 27.6%
Putnam/Putnam County M.S.	27%	>95%	86.5%	2%	M: 38.7% S: 33.7%
Washington/T. J. Elder M.S.	32%	77.90%	90.3%	4%	M: 34.2% S: 31.8%
Wilkinson/Wilkinson County M.S.	30%	53.77%	75.8%	15%	M: 33.9% S: 56.8%

a. U.S. Census Bureau
b. Governor's Office of Student Achievement, https://gosa.georgia.gov/research-reports, 2018 Downloadable Data: Teacher Workforce Retention by District
c. Georgia Professional Standards Commission, "Emergency Waivers 2018 (1-24-2019)"
d. Governor's Office of Student Achievement, 2018 School Report Cards

The districts in the Oconee region all meet the definition of high-needs districts as defined in the federal notice, with 27-40 percent of children living in poverty according to the U.S. Census Bureau's Small Area Income and Poverty Estimates (SAIPE). While the median 2018 district-wide teacher retention rate in Georgia was 87.6 percent, five of the Oconee RESA districts reported teacher retention below that rate. Furthermore, in Wilkinson 15 percent of middle school teachers are teaching with emergency waivers, and in Hancock fully 48 percent of middle school teachers are teaching with emergency waivers.

At a time when many states are experiencing shortages of teachers for math and science, and novice teachers are leaving the profession at high rate within their first three years of teaching when placed in high-need schools, there is a need to try a new model for preparing teachers. Guha, Hyler and Darling-Hammond (2016) point out that these teacher shortages disproportionately impact schools serving our most vulnerable student populations. Nguyen and Redding's (2018) descriptive analysis of changes in demographics, qualifications, and turnover of STEM teachers, 1988-2012 confirms that placement in high-minority schools and unsupportive working conditions are correlated with STEM teachers leaving the classroom at higher rates than teachers in other subject areas — perhaps because STEM teachers have more options for employment outside education. Teaching vacancies in these schools during a time of shortage are often filled by underprepared teachers who then struggle, fail, and leave. The continual churn caused by teacher attrition is costly to districts in terms of student achievement and progress on school improvement. The GREAT partners are committed to providing all students high-quality instruction that prepares them for success in college, careers and life. Student learning will not reach the high levels necessary for success in a global economy and a technology-driven physical and social environment unless teachers have a deep understanding of the content they teach and use

instructional practices that are proven to engage students in deep learning of content and the requisite cognitive, technical and social-emotional skills. Ensuring teachers have opportunities to develop and grow their instructional expertise requires close collaboration between the university that prepares teachers and the districts and schools where they enter the profession.

Further, the GREAT partners share the conviction that the most important thing that can be done to improve student learning is to improve the teaching students receive (Hanushek, 2011; Hattie, 2012; Strong, Ward and Grant, 2013; Gitomer and Bell, 2016; Muijs and Reynolds, 2018). The nation as a whole suffers from a shortage of teachers with a strong background and experience in teaching mathematics and science. According to data compiled by the Education Commission of the States (ECS, 2019, using 2017 data) only 22 percent of 8th grade students in Georgia were taught math by teachers with an undergraduate degree in math, and only 31 percent of 8th grade students were taught science by teachers with an undergraduate degree in science. Efforts to improve teachers' knowledge and skills in the STEM fields they plan to teach can help raise student achievement. Many middle school STEM teachers feel that insufficient content or pedagogical knowledge impedes their abilities as STEM teachers (Covay Minor, Desimone, Caines and Hochberg, 2016).

Figure 1 displays our logic model. It shows the relationships among inputs, activities and strategies, outputs and outcomes for this project.

Inputs	Activities/Strategies	Outputs	Outcomes
Partnership - GCSU - SREB - Districts - RESAs Funds - TQP grant - 100% match Staff - GCSU faculty - Highly skilled mentors - SREB instructional coaches Residents - Bachelor's degree in a STEM field	- Active recruitment by SREB, GCSU and districts - Selection process agreed upon by all partners - Rigorous selection by district, GCSU and SREB - 54 credit online MAT program completed over 5 semesters - Resident living stipend equal to first-year teacher pay - Expert mentoring - Residents make long-term commitment to district - Full-year residency in grade 6-8, plus experience in grades 4-5 - Face-to-face and virtual coaching by SREB instructional coaches - Two years of continuing induction	- 54-60 well-prepared, full-time middle grades STEM teachers hired after completing residency - All are fully certified by the Georgia Professional Standards Commission (GaPSC) when they complete their MAT's. - All are teaching STEM subjects in high-need schools with a need for STEM teachers - 25% of residents earn GaPSC endorsement in computer science - Residency model is continued by GCSU and Georgia school districts	- Retention of residents is higher than the teacher retention rates for the state - Math and science EOG proficiency scores for students taught by residents are higher than proficiency scores for students taught by comparison teachers - Math and science EOG growth scores for students taught by residents are higher than growth scores for students taught by comparison teachers

Figure 1: GREAT Logic Model

(A2) Goals, objectives and outcomes are clearly specified and measurable

Table 2 shows the goals, objectives and outcomes for GREAT. Table 4 in the Evaluation Plan section includes the measures to be used to assess each goal and related objectives.

Table 2. Goals, Objectives and Outcomes

Goal 1:	Develop and implement the GREAT Teacher Residency model, increasing the capacity of project partners to select and prepare highly qualified STEM teachers while using a continuous improvement process to make recommendations for revisions to implementation to maximize effectiveness.
Objectives	**Outcomes**
1a. Establish a strong recruitment process and a competitive selection process.	The recruitment and selection processes will produce three cohorts of 20 well-qualified residents.
1b. Increase the capacity of the GCSU MAT program, especially in computer science.	Updated MAT course syllabi that reflect a close integration with the residency and the high-priority residency practices.
1c. Develop a comprehensive two-year induction program to follow the one-year residency.	*60 trained teacher mentors in the partner districts. *Professional development support results in a 10% increase in teachers' sense of efficacy based on the TSES.
1d. SREB establishes statewide collaboration in support of teacher residency programs.	In years 4-5, SREB will hold quarterly networking meetings where information and resources are disseminated to various stakeholder groups (e.g. LEA's, teacher prep programs)
1e. Improve the fidelity of implementation for subsequent cohorts	By the end of the first cohort (Y2), GREAT program components will be implemented with 80% fidelity; 90% fidelity for Cohorts 2 and 3. (Yrs. 3 & 4)
1f. Development of high-quality, effective partnerships	Partnership rated at least 18 of 20 on partnership self-evaluation rubric. (PRISM)
Goal 2:	Increase the supply of well-prepared novice teachers with a background in STEM fields entering the teaching workforce in high-needs districts in Georgia.
Objectives	**Outcomes**
2a. Using a residency program with a 90% completion rate, prepare three cohorts of 20 new teachers. [60 participants selected, 54 completers, 10% attrition]. (GPRA 1, 2 &3)	Candidates will earn their MAT from GCSU; candidates will successfully pass GACE exam and meet all other requirements for a Georgia teaching license.
2b. At least 25% of program completers will be specifically certified to teach computer science. (GPRA 2)	Attainment of Georgia Professional Standards Commission Certification as a Computer Science educator.
2c. Retention of teachers who have completed the residency program will match or exceed retention rates for novice teachers prepared by traditional programs. (GPRA 4 & 5)	Retention rates of program completers will be higher than state and district data for all novice teachers entering the teaching workforce.

Goal 3:	Improve middle grades student achievement in science, mathematics, and reading, and increase students' awareness of and interest in STEM careers and computer science.
Objectives	**Outcomes**
3a. The students of GREAT teachers will meet or exceed district and state *proficiency* results on End of Grade assessments. (GPRA 6)	*The % of students assigned to GREAT teachers proficient on annual Math assessment will increase 5 percentage points per year in Years 3-5. *The % of students assigned to GREAT teachers proficient on annual math and science assessments will be 5 percentage points higher than comparison students each year.
3b. The students of GREAT teachers will meet or exceed district and state averages for *student growth* for their grade levels. (GPRA 6)	*The median growth percentile for students assigned to GREAT teachers will increase 3 points per year, in Years 3-5
3c. Students will possess a greater awareness of STEM and computer science fields and an increase in their intention to persist in course-taking in STEM and computer science related fields in high school.	Each year, students will report at least a 10% increase in mean scores for STEM attitudes and career interest based on the *S-STEM* Survey (Friday Institute, 2012)

(A3) Designed to build capacity and yield results extending beyond grant period

The GREAT Partnership: New and Expanded Partner Capacity

As stated in our shared purpose, each partner brings unique capabilities to this collaboratively-designed effort to prepare middle grades STEM teachers. However, equally important is how each partner's traditional role will be expanded through the development and implementation of this residency program.

The **university's role** in preparing new teachers has typically included conducting the admissions process by which candidates are enrolled in the MAT program, delivering high-quality instruction through their online MAT program, providing direct supervision of interns to support documentation that program completers meet state requirements and conferring the Master of Arts degree on those who complete MAT requirements. And, while they will continue to fulfil those roles in this program, each of those processes will be enhanced through revisions made as part of the GREAT.

In GREAT, GCSU takes on additional responsibilities such as working with SREB to align the curriculum of the MAT program with the high-priority practices that specify what an effective middle grades STEM teacher knows and is able to do, revisiting the role of the field experience supervisors so their work complements the work of the mentor and SREB's coaches and serving as a thought leader in the continuous improvement process that will generate revisions to the program design throughout the project. Finally, the university will be able to utilize the data from the external evaluation of GREAT to identify additional revisions to the MAT program of study and the content of individual courses as well as to generate new approaches to working with districts and schools in the university's service area.

Traditionally, districts have been passive consumers of teacher preparation programs–having little influence over who is admitted to the program, how prospective teachers are prepared and how field experiences are designed. GREAT engages the **partner districts** in a much more active role in that they will take the lead in recruiting candidates for the program and in identifying mentors through a process co-designed by all partners and in developing a plan for a two-year induction component. This process, although led by district staff, will involve all partners and final approval for all mentors will be a joint determination by the partners.

Districts have also committed to significantly expanding how they use mentors to support developing teachers by placing each resident with a trained and highly-effective mentor for the year-long residency. They have also agreed to release the mentors for required meetings and training. This is a noteworthy commitment on the part of the districts as an IES report on mentoring new teachers found that 69 percent of the districts they surveyed did not provide release time for mentors to work with new teachers (DeCesare, Workman, and McClelland, 2016).

These mentors will become true leaders in teacher preparation as they work with principals, district staff and university faculty to refine how teachers are developed and supported as well as planning and implementing a comprehensive, jointly-planned induction process. They will also begin building a community of learners as they share what they are learning about teacher development and how teachers grow their expertise with the faculty.

Another important resource schools and districts will gain as a result of participating in GREAT is a comprehensive teacher induction plan and enhanced capacity to implement induction for new teachers in the future. Through this project, districts will develop a cadre of mentors and new teachers who are knowledgeable about a broad array of teaching resources that are aligned to state standards and can help other teachers make more effective use of them. The Oconee RESA staff, who delivery training on navigating the GaDOE resource websites in every district in their region, can also assist mentors and new teachers to make effective use of these resources, which currently are not being used at the desired level (information gleaned from SREB's work with the Georgia Resource Project Steering Committee charged with reviewing and reporting on the quality and use of resources available at GaDOE websites). The coaches will also share teaching resources developed by SREB, including information and protocols developed in other projects focusing on STEM instruction, PBL, quality STEM projects and assignments developed by other teachers they have worked with, rubrics for assessing student work, and publications about effective teaching of STEM subjects in the middle grades.

To help in the evaluation of GREAT, districts will also collect, aggregate and share state testing data for classrooms where GREAT residents are serving as teachers, as well as student achievement data for teachers identified by the study evaluators as controls. By feeding these data

back to the university, the districts take on a new and impactful role in shaping teacher preparation so new teachers are prepared to be successful in their districts.

(A4) Exceptional approach to training math and science teachers

This project represents an exceptional approach to increasing the supply of high-quality math and science teachers in middle schools throughout central Georgia. The main components of this project include completion of:

(1) A year-long residency where teachers spend at least 50 percent of their time with a same-subject mentor, in a middle school classroom that reflects the reality of teaching in the district and school context where they are likely to be hired as full-time teachers.

(2) A MAT degree in either Middle Grade Math or Middle Grade Science

(3) Extensive, individualized coaching provided by content experts from SREB, which will occur both face-to-face and virtually, through video-based feedback on their instruction

(4) A two-year induction period following the residency, where teachers continue to receive support and feedback from mentors SREB instructional coaches.

Further, GREAT represents an exceptional approach to preparing middle grades STEM teachers because of 1) our close adherence to an evidence-based model for designing teacher residency programs, 2) the focus on instructional practices that make a positive difference in student achievement and 3) the enhancements we built into individual program components.

Evidence-based Teacher Residency Design Features

Guha, Hyler and Darling-Hammond (2016) identified eight design features that distinguished effective residency programs from most traditional teacher preparation and alternative certification programs. These features are:

1) Strong district-university partnerships.

2) High-ability, diverse candidates recruited to meet specific district hiring needs, typically in fields where there are shortages.
3) A full year of apprentice teaching under supervision.
4) Coursework about teaching and learning tightly integrated with clinical practice.
5) Carefully-selected and well-trained mentors who coteach with residents.
6) Cohorts of residents placed in "teaching schools."
7) Ongoing mentoring and support for graduates.
8) Financial support for residents in exchange for a three- to five-year teaching commitment.

The GREAT Partnership: A Shared Purpose

The purpose of our partnership is straightforward: To combine our capabilities and resources in ways that generate an impactful synergy so together we produce stronger outcomes than the partners could achieve working independently. To that end, the partnership will facilitate close communication so each partner understands the goals, needs and constraints of the others and how their own resources can best be used to enhance outcomes for all. For example, the partners will conduct a careful analysis of the hiring needs of participating districts to guide the recruitment of teacher residents so the program will help the partner districts fill vacancies in subject areas where teacher shortages exist and to supply teachers for specific school situations (e.g., schools that serve higher proportions of high-need students or schools where achievement gaps persist).

The Recruitment and Selection of Teacher Residents

Critical to the success of GREAT is the selection of candidates who are highly-qualified, highly-committed, have a strong STEM background, reflect the diversity of the school population and are a good fit for the community in which their residency will take place. The recruitment and selection process includes three elements: 1) an attractive package of incentives, 2) sharing

program information through multiple types of media with a large pool of potential candidates and 3) a highly-competitive multi-step selection process.

The GREAT **incentive package** is comprised of multiple components that should appeal to a broad range of potential candidates. These components compare favorably with the inducements available for other similar programs, going beyond what is provided by the typical residency program in terms of financial assistance and support for professional learning. They include the same salary and benefits provided to Georgia first-year teachers, a strong support system during the residency in the form of mentoring, coaching and university faculty supervision, a graduate degree and continued professional development and support during the first two years of employment following the residency in a well-designed induction process.

Most residency programs offer financial incentives to attract and retain high-quality candidates, but the typical incentives are limited to living stipends, student loan forgiveness, and/or tuition remittance in exchange for residents' commitment to teaching in the district for a specified period of time, typically three to five years (Guha, Hyler and Darling-Hammond, 2017).

Qualified candidates will be recent graduates with a baccalaureate degree or a mid-career professional from outside the field of education with strong content knowledge or a record of professional accomplishment. To identify a sufficiently large pool of qualified candidates, we plan to **share program information** through diverse methods. These include posting relevant information on the Websites of GCSU, the partner districts and SREB; distributing informational brochures and working with the human resources directors of the partner districts to access the recruiting resources they typically use (e.g., job-posting services like Indeed.com).

Because we believe our recruiting efforts will result in a large pool of qualified candidates, the GREAT Program **selection process** will be highly competitive; resulting in only the best candidates being selected to become teacher residents. The steps of the process are:

1) Applicants provide the following documentation of their qualifications:
    a. A bachelor's degree in a STEM or STEM-related field from an accredited college/university, with an earned GPA of 2.75 or better
    b. Two professional recommendations using the GCSU format
    c. Official transcripts from all colleges/universities attended
2) Applicants demonstrate strong STEM content knowledge or a record of professional accomplishment in a STEM or STEM-related field (as documented in college transcripts or employer's performance assessments) as well as strong written and oral communication skills (via a short essay and interview).
3) The Gallup Teacher Insight assessment will provide data that has been demonstrated as valid and reliable for screening prospective teachers.
4) Applicants self-reports on dispositions such as persistence, resourcefulness, understanding of cultural differences, belief of their efficacy for impacting students' academic success and coachability.
5) Data on applicants is reviewed by a district team. The most qualified candidates are screened into the interview phase of the selection process.
6) Selected applicants are interviewed by a joint partner panel with representatives from GCSU, the participating districts and SREB.
7) Applicants who are assessed as the most qualified submit applications to GCSU.

8) Slots are filled from those accepted into the MAT program according to the hiring needs of the participating districts and goodness of fit with the community in which each participating school is located.

Year-long Residency

GREAT Program residents will receive significantly **more hours of clinical experience** (estimated 1,410 hours) than typical teachers-in-training, primarily because they will work with their mentor teacher during pre- and post-planning days as well as other teacher workdays/student holidays. Working alongside their mentors on these days will benefit the residents by allowing them to see the critical preparation teachers make before the school year begins as well as participating in the training offered to teachers on dedicated professional development days.

While the greater length of clinical experience adds value to the residency, it is the focus on "regular, systematic opportunities to practice essential aspects of teaching, so that they may gain the necessary repertoire to teach students in ways that support their learning" (Peercy and Troyan, 2017, p. 27) that contributes significantly to the GREAT residency being an exceptional approach to teacher preparation. SREB staff and GCSU teacher preparation leaders worked jointly to identify **high-priority instructional practices** (see Appendix J Other Documents for a list of these practices and where they are addressed in the MAT courses) that will be used to ensure the MAT coursework thoroughly addresses each practice and that teacher residents have multiple opportunities to employ each practice and receive feedback on their performance.

Our focus on these high-priority practices is based on what we have learned from the last half-century of research on teacher preparation. While competency-based teacher education (when research was grounded in a behavioral model of learning) and case-based methods for teacher education (as researchers shifted their focus from teachers' behaviors to teachers' thinking and knowledge) were attempts to better prepare teachers for the complex task of teaching, neither

successfully attended to what Kennedy (1999) labeled the *problem of enactment*, or the gap between what new teachers can consider and what they are able to do. The move toward high-priority practices is an attempt to weave together novice teachers' development of meaningful knowledge about teaching with their capacity to actually enact effective teaching in the classroom. In GREAT we address the problem of enactment by ensuring residents learn to apply practices that are essential to the work of teaching, and which novices can learn to enact in their early years.

A key element of the residency is the use of video recordings to improve the quality of feedback teacher residents receive from coaches and mentors as well as the self-assessment of their classroom performance. Typically, when a university supervisor conducts observations of teacher residents it is part of their official evaluation. Using video observations can disrupt that "high stakes" mentality by changing the conversations between the residents and those supporting them. One research study has shown that when using video observations, "teachers perceived observations to be fairer and were more likely to describe a specific change in their practice resulting from their post-observation conference." (CEPR, 2015, p.4) This research also showed "allowing teachers to choose which lessons to submit did not get in the way of identifying those who were struggling…giving teachers control of the video collection and submission process…reduced teacher defensiveness." (CEPR, p.5)

Close Integration of Coursework and Clinical Practice

Close integration of university coursework and the authentic practice setting of the teacher residency is essential if teacher residents are to gain high levels of pedagogical skill. This goal is achieved through a six-step process.

1) Prior to the first online course, GCSU faculty work with SREB staff to analyze MAT program course content in terms of the high-priority residency practices (see crosswalk template in Appendix J Other Documents).

2) Appropriate course revisions are made and practices identified as needing additional depth of coverage are targeted during on-going professional development delivered by SREB instructional coaches.
3) Teacher residents and mentors review assignments from individual GCSU courses at the beginning of each term (when a new online course is started) to identify assignments involving clinical experiences and/or aligning with content to be taught in the residency classroom. (Based on the needs of individual residents; mentors and coaches may provide additional training and support for developing thematic units that integrate course assignments with middle grades content.)
4) Teacher residents and mentors embed the identified assignments into their work with students; providing authentic practice for teacher residents as a key component of their preparation.
5) Teacher residents share their learning experiences (successful and not so successful) with GCSU faculty and their fellow residents via online discussions of course assignments; obtaining additional guidance and feedback. Video recordings of how the teacher residents implemented the assignments in their classroom will be reviewed by GCSU faculty and SREB coaches to provide specific feedback to residents on their performance.
6) GCSU faculty utilize teacher residents' questions and experiences to refine their assignments for future cohorts.

In addition to aligning closely with the clinical experiences of the residency, GCSU coursework addresses several key teacher preparation content areas. These include preparing new teachers to 1) work effectively with students with disabilities, including how to contribute as a member of individualized education program teams (EDEX 6111 *Exceptional Individuals in the*

Regular Classroom); 2) provide instruction that is responsive to young adolescents' local, national, and international histories, language/dialects (EDMG 5214: Middle Grades Learners); and to understand and use research and data to modify and improve classroom instruction (EDRD 6150 Literature, Reading, and Writing in Content Fields).

In accordance with GaPSC rules for teacher preparation in the State of Georgia, math and science subject matter content is taught by the appropriate faculty of the College of Arts and Sciences in the GCSU MAT program, rather than College of Education faculty. This ensures that while pedagogy is taught by experts in teaching, the mathematics and science content is taught by professors whose primary expertise is in that content. In the summer of 2017, three faculty from the College of Arts and Sciences began teaching courses as part of the MAT program. In the summer of 2018, that number increased to five, and it is increasing to six in the summer of 2019.

Selection and Training of Mentors

The principal at each participating school plays a key role in the **selection of mentors** using the following criteria to recommend potential mentors:

1) Demonstrates knowledge of content, instruction, and assessment, including the use of formative and diagnostic assessments to improve student learning.
2) Provides instruction that engages students with different learning styles or special needs.
3) Collaborates effectively with colleagues to improve instruction.
4) Has consistently produced gains in student learning, based on multiple measures.
5) Demonstrates commitment to continued professional learning.
6) Has one or more certifications above basic teaching credentials.
7) Has sufficient classroom teaching experience to serve as a mentor.
8) Has experience in mentoring new teachers.

Formal approval of the principals' recommendations will be made by the Core Planning Team following a review of the ratings provided by the principal on the form found in Appendix J.

Mentors will be selected from math and science teachers at the participating middle schools. This is essential if mentors and residents are to have regular and ongoing opportunities to observe each other's teaching methods in real classroom settings. However, this condition limits the pool of potential mentors, particularly at smaller middle schools. To work within this constraint, the SREB coaches will tailor their support for each mentor to that person's individual needs.

SREB coaches will **train GREAT mentors** in a two-day workshop convened at GCSU. This training will be based on a model of mentoring adapted from two different perspectives. The first conceptualization is in the form of a framework suggested by Garza, Reynosa, Werner, Duchaine and Harter (2019) that describes resident and mentor actions as evolving through three distinct stages. Table 3 provides a sample of the types of actions that occur in each stage.

Table 3. Examples of Resident and Mentor Actions

Stage	Teacher Resident Actions	Mentor Actions
Orientation	• Begins as observer, but moves into role of co-teacher • Builds rapport with students • Acclimates to school and classroom culture • Begins to take responsibility for instruction • Observes other teachers	• Establishes self as role model; welcomes resident as co-teacher • Shares insight into school and classroom culture • Provides opportunities for resident to teach • Facilitates discussion/reflection sessions
Integration	• Participates actively as co-teacher • Engages in lesson planning with mentor • Begins to develop teacher identity • Initiates feedback/reflection sessions	• Commitment to involve resident as co-teacher • Involves resident in lesson planning • Models professional teacher identity • Gives priority to feedback/reflection sessions

Stage	Teacher Resident Actions	Mentor Actions
Application	• Assumes lead role in planning/delivery of instruction • Uses mentor feedback to improve practice • Demonstrates increasing skill in high-priority practices	• Reviews resident-developed lesson plans • Solicits explanations and explores problematic issues through a collaborative problem-solving approach

Brondyk and Searby (2013) outlined a second conceptualization of the changing nature of the resident/mentor relationship in describing how mentors sometimes need to act as the instructor transferring skills to the resident and at other times as a partner in the classroom, with the mentor as a supportive guide. As the resident develops greater capacity and insight, mentor and resident can become more equal and function more as colleagues; engaging in collaborative problem-solving. This way of thinking about mentoring suggests that mentors may need to move from one form of mentoring to another in order to meet the context-specific needs of their resident. That is, in some circumstance, the mentor may need to explain in direct fashion how a particular teaching task should be done, while at other times, the resident may work collaboratively with the mentor in developing instruction or resolving a classroom management issue.

Over the course of the residency, we anticipate the needs of the residents and their capacity for learning from interactions with their mentor will ebb and flow. Because our model reflects a blending of these two mentoring frameworks, our approach can help mentors be better prepared for the changing needs of their residents. It can help make mentors be consciously aware of how their role is likely to evolve and change throughout the residency. This metacognitive approach may help mentors become more responsive to the needs of their resident and guide the mentors in selecting just the right approach for each situation.

In addition to the direct training provided by SREB coaches, the GREAT mentors will have access to a set of online modules through the GaDOE (see overview of module content in Appendix J) designed to support mentors with task-specific advice on working with novice teachers. They cover three topics: 1) Building Trust, 2) Responding to Diverse Learners and 3) Enhancing Mentor Knowledge. Each of the three modules is made up of three lessons that contain a diverse multimedia resources. Each lesson will take approximately 60 to 90 minutes to complete.

The modules emphasize the importance of learning for ALL students. Therefore, in addition to demonstrating how to build the mentor relationship, the modules cover topics such as how to help new teachers engage English Language Learners and create lessons that are culturally responsive. They include case studies that show how mentors help teachers get beyond stereotypes and surface-level observations and look closely at their students' learning needs in data-driven ways.

Cohorts of Residents Placed in Teaching Schools

The participating schools are primarily small, rural schools where the influence of higher education institutions has not trickled down to the point where these schools reflect true "teaching schools." However, GREAT will begin to build the framework for them to become more like teaching schools through the development of a cadre of mentor teachers, a consistent focus on improving instructional practices, a more effective model of professional development and greater involvement with university faculty and expert coaches.

Induction

The goals of teacher induction are to increase retention and improve teachers' skills and self-efficacy, ultimately improving student achievement (Ingersoll, 2012). Research has produced evidence that high-quality induction programs can increase teacher effectiveness and improve student learning when implemented well (Glazerman, Isenburg, Dolfin, Bleeker, Johnson, Grider, and Jacobus, 2010; Ingersoll and Strong, 2011). Additionally, Villar and Strong (2007) found that

induction programs can return substantial financial benefits well beyond their costs by reducing costs of recruiting, hiring and orienting new teachers to the district and school culture.

While most districts offer some form of induction or mentoring, it is often a limited set of services that falls short of a "comprehensive" induction — a program of supports for novice teachers or those new to the district that is intensive, structured and sequentially delivered in response to teachers' emerging pedagogical needs. Comprehensive induction is often delivered through experienced, trained fulltime mentors and may also include a combination of school and district orientation sessions, special professional development, classroom observations, and constructive feedback through formative assessment (Glazerman et al. 2010).

More recently, Potemski and Matlach (2014), writing in a Policy Snapshot published by the Center on Great Teachers and Leaders, identified the features of an effective comprehensive induction program, based on findings reported in five studies of induction.: 1) an orientation to the district and school culture through effective principal leadership and communication; 2) instructional support that includes data-driven conversations between mentors and through peer-based professional learning communities; 3) a set of professional expectations that are aligned with school, district or state standards; and 4) ongoing professional development based on individual teacher needs.

The literature on induction reflects the goals and features of the comprehensive induction process the GREAT partners will implement for residents who complete the program's year-long residency. Our goal is to provide support for new teachers that helps them make a successful entry into the culture and context of the schools in which they are beginning their teaching career, responds to their pedagogical needs and bolsters their confidence in their ability to teach, and assists them in continuing to grow their instructional expertise. This model of induction should

ensure that they have a positive impact on student achievement and, as a consequence, are satisfied enough with their work and workplace that they remain in their schools and in an education career for the long haul. Our concept of *induction* is drawn from the work of Fulton, Yoon and Lee (2005): induction is a system of supports, people and processes that are all focused on assuring the novice teachers become effective in their work. The following paragraphs provide descriptions of 1) the structures for planning and implementing the comprehensive GREAT induction process, 2) the role of each partner in implementing the induction process and 3) the forms and focus of the supports new teachers will be given during their induction

The induction process for GREAT teachers will build on the foundation of STEM content and pedagogical course work, the extensive classroom practice during the new teacher's residency and the strong collaborative relationships the partners develop during the initial project planning and the residency so that the new teachers experience a seamless, coherent system of support and professional learning that helps them grow their teaching expertise during the early years in the classroom. The professional growth plan prepared by the resident, coach and mentor at the end of the residency becomes the launch pad for the new teacher's induction. The particular role the university faculty will play during the induction is that of advisor and ongoing resource to the mentor and new teacher.

Beginning in project year 2, SREB coaches and project staff, university faculty and designated district staff will begin working with each school hosting a resident to help the school form a New Teacher Induction Team (NTIT) and develop an induction plan based on research and criteria developed by the GREAT Core Planning Team and the existing district or school process. The NTITs will be comprised of the principal; school-based specialists/instructional coaches for math,

science or computer science; and the new teacher's assigned mentor teacher. Elements of the GREAT New Teacher Induction Process are described in detail in Appendix J Other Documents.

Financial Support in Exchange for Commitment to Teach

A study of residency programs compared the resident stipend to the average salary for first-year teachers in six districts (Silva, McKie, Knechtel, Gleason and Makowsky, 2014). Those salary data, which are for 2011–12 (in one case 2012–13), show that the living stipend in the 12 programs averaged 43 percent of the average first-year teacher's salary, with the smallest stipend 22 percent of the average salary and the largest 66 percent.

The living stipend in GREAT equals 100 percent of a first-year teacher's salary, which is approximately $39,000. Following the residency year, teacher residents will complete the certification process and become teachers of record in their sponsoring districts. Residents will commit to serving as a teacher in their sponsoring district for a minimum of three years following their initial residency (one year as resident, three years as teacher of record). Residents who do not fulfill this commitment will be required to repay any stipends received to the district.

Emphasis on Evidence-based Instructional Practices

To ensure GREAT residents are equipped with the most effective instructional practices, we reviewed the current knowledge base for STEM-related teaching practices and selected those we considered the most essential for novice teachers to master. We refer to these elements as "high-priority resident practices." We created clusters of related practices to populate the crosswalk (see Appendix J Other Documents) we will use to review the content of each course in GCSU's MAT in Middle Grades Science and Mathematics for the purpose of identifying where each practice is addressed and determining where course content and assignments should be revised to ensure GREAT residents learn and have sufficient opportunities to apply these essential skills.

The crosswalk is organized into clusters that were drawn from the NCTR's research brief entitled *High Priority Resident Practices: Six Key Practices to Prepare Teacher Candidates for Effectiveness.* Within the first cluster, there are multiple sets of related instructional practices. The first set represent widely applicable teaching strategies derived from the recommendations of the IES Practice Guide *Organizing Instruction and Study to Improve Student Learning* (2007). They include practices such as spacing opportunities for students to work with targeted content, using concrete examples to illustrate important concepts and using prompts that encourage students to pose and answer "deep-level" questions on content. Another cluster lists eight characteristics of high-quality assignments. These include aligning assignments with standards and requiring students to engage in higher cognitive demand tasks. The primary source for this cluster was Education Trust's *Checking in Update: More Assignments from Real Classrooms* (2016).

The crosswalk also includes a set of science and engineering practices drawn from Bybee (2011). This cluster includes practices such as planning and carrying out investigations, constructing explanations and designing solutions. The goal of using these science and engineering practices is to provide students with practice with the strategies utilized by professionals in STEM disciplines. These practices are effective instructional strategies and they contribute to building students' interest in STEM careers.

Technology-related practices on the crosswalk reflect the framework proposed by Koehler and Mishra (2009). The TPACK framework is based on the idea that good teaching with technology involves three core components: content, pedagogy and technology. As residents make use of technology, they integrate these components based on what they know about the content they are teaching, their understanding of instruction and their technological expertise. These technology practices require residents to 1) know how to use the available tools and applications as well as

basic coding principles (technological knowledge); 2) understand how STEM workers use technology and 3) integrate the use of technology into their day-to-day teaching.

Unique Enhancements to Residency Program Components

Each of the components of GREAT has features that represent important enhancements compared to how those components are structured in traditional teacher preparation programs. These will have significant payoffs in the future in terms of each partner's effectiveness. A number of these unique features have been described earlier in this proposal, but a concise list of the features that contribute to making GREAT an exceptional approach appears below.

- Joint partner analysis of graduate coursework ensures that **evidence-based instructional practices** are thoroughly treated and that course assignments provide multiple opportunities for teacher residents to engage in these practices during the residency.
- Mentors continue to increase their knowledge and skill in supporting their residents through **on-going professional development** such as the Mentor Modules, attendance at SREB's Summer Conference and learning directly from SREB instructional coaches.
- Teacher residents receive **feedback** from SREB's coaches as well as their mentor and university supervisor. The coach and mentor serve in a non-evaluative capacity and therefore, the resident can be more open about critical issues and concerns.
- Teacher residents receive **enhanced financial support**; making the program more attractive to highly-qualified candidates and increasing the likelihood teacher residents will be able to continue to completion of the program.
- As teacher residents take on greater responsibility for instruction, they will make **video recordings of selected lessons** and upload those videos so they can be reviewed by their mentors and coaches. This process can accelerate the coaches' efforts to get to know the

residents and their strengths and weaknesses compared to relying solely on on-site coaching visits to observe residents in action.

- Revised GCSU course offerings will allow teacher residents to complete the requirements for Georgia's **Computer Science Endorsement**.
- Maintaining the relationships among residents, mentors and coaches during the **two-year induction process** will allow deeper analysis and more targeted assistance because they will not have to spend time getting to know the teacher's capabilities and areas of need.
- Mentors enjoy **on-going support** from SREB coaches and a "mentor hotline" that can be used to access advice on mentor-resident issues that require immediate attention.

B. Adequacy of Resources

(B1) The adequacy of support and resources from SREB and Other Partners

Founded in 1948 as America's first interstate compact for education, the Southern Regional Education Board (SREB) is a non-profit, nonpartisan organization formed by Southern governors and legislators who recognized that states working together could achieve more to improve public education than they could alone. SREB is led by a board that includes governors and their appointees (legislators, educators and other leaders) from the compact states — Alabama, Arkansas, Delaware, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia.

SREB has sufficient financial and human resources to deliver the services described herein. SREB currently has 121 employees located in 19 states. Seventy-two percent of SREB's employees (87 of 121) hold advanced degrees. SREB is headquartered in Atlanta, Georgia, and currently carries out school improvement work in 30 states. In the last fiscal year SREB's program revenue exceeded $27 million, and net assets exceeded $26 million.

For more than 30 years, SREB has partnered with states, districts and schools to identify and implement strategies that engage and empower young people to put what they learn in the classroom to work in the real world. SREB helps districts and schools identify barriers to achieving their college and career-readiness goals and take ownership of the strategies and solutions they need to increase the percentage of students who graduate high school college and career ready. SREB school improvement frameworks help schools make successful transitions by:

- Aligning instruction with grade-level college- and career-readiness standards;
- Connecting classroom learning with real-world problems;
- Using instructional time to meet students' unique needs;
- Empowering teachers to co-plan instruction and assignments within and across disciplines;
- Offering developmentally appropriate career exploration;
- Personalizing learning to reflect students' interests; and
- Accelerating credential and degree attainment.

SREB has extensive experience in providing high-quality professional development for middle grades teachers and school leaders that focuses on practices linked to the improvement of student achievement, as well as coaching, planning and supporting the district-wide implementation of new instructional practices and large-scale middle school reform efforts. In GREAT, SREB will expand its role to include collaborating with GCSU to strengthen the STEM components of its MAT program and the pedagogical elements of the MAT courses. This effort will include a joint faculty-SREB analysis of course syllabi to determine alignment between course content and the high-priority practices that reflect what effective middle grades STEM teachers should know and be able to do. SREB plans to extend this type of collaboration with

other teacher preparation programs and develop a network of universities that are seeking to improve the quality of their programs and the effectiveness of the teachers they produce.

SREB's role includes executing the communication plan so all members of the partnership are kept fully apprised of all program requirements and milestones. We will also provide mentors with two days of training during the summer before the residency year for each cohort, as well as ongoing support and professional development throughout the residency and the induction. This support will include weekly instructional coaching to residents and mentors.

SREB will serve as the fiscal and reporting agent for the project throughout the grant period and, SREB will provide, using grant funds, 100 percent of each resident's salary stipend during the residency year, while sponsoring districts cover the resident's health benefits.

SREB will work to build long-lasting relationships among the other partners as part of the "bridger" function through which a partner facilitates communication and understanding across diverse partner organizations. Goldring and Sims (2005) found that "the bridger role" or "boundary spanner" was central to the process of creating successful partnership structures that promote effective interorganizational relationships.

SREB Personnel

Each member of the team has a well-defined role and functions well in a team environment. Their background and responsibilities are listed below. The program director and project manager are both experienced in managing large and complex training programs. A project management team meeting will be held monthly either in Atlanta or Milledgeville, attended by SREB staff listed here, GCSU's MAT program director, and key faculty. The external evaluator will attend virtually when the agenda pertains to the project evaluation. District liaisons will be invited to attend but not required to do so. Resumes for the GREAT team are included in Appendix B.

GREAT Project Management Team

Dan Mollette, *Program Director*, will oversee all project activities and manage GREAT, and serve as primary point of contact with partners including GCSU and the districts. A former director of mathematics, and project lead for several multimillion-dollar projects, Mollette has worked with schools and districts in over 16 states coordinating PD, budgets, and personnel management.

Jon Schmidt-Davis, *Project Manager*, will oversee day-to-day operations of the project. SREB's Program Director – Learning-Centered Leadership since 2012, he is a former teacher, education researcher, and state department consultant with over 20 years' experience in K-12 education. He has designed, led, and delivered PD in nine of the SREB states, including directing a $7 million multi-year program in Florida that trained more than 100 turnaround leaders in that state.

Dr. Betty Fry-Ahearn, SREB team member, brings to the project team more than five decades experience in education, including: seven years as a classroom teacher; four years as principal of Florida's largest elementary school; many years as a consultant, bureau chief and director for the Florida state education agency and the Southeast Regional Vision for Education. While at the Florida Department of Education Dr. Fry oversaw all teacher preparation, training and licensure for the state.

University Resources

GCSU College of Education has a stable, experienced and sufficient faculty to draw upon for providing the GREAT course work. Since the program is delivered online, university facilities will not be taxed. The grant budget will provide funds for GCSU to create and fill one new faculty position that is dedicated full time to assisting implementation of GREAT. The grant will include funds to support GCSU faculty in the revision of courses for the GREAT MAT program. The grant provides funds also for the upgrading of the GCSU STEM Lab where faculty can make

instructional videos for MAT students demonstrating various problem-based STEM lessons aligned with specific Georgia math or science standards, allowing the residents to view and store these video resources, and refer to them often during their induction period. This resource, lasting well beyond the completion of the residency, will serve to support them as they begin their teaching career.

Oconee RESA Resources

Georgia RESAs are funded by state, local, federal, and grant funds. State funding is appropriated by the General Assembly and is allocated by a formula that considers RESA membership and size. Member school systems contribute to the operation of each RESA through locally-determined membership fees and charges for specific services. A portion of the partner districts allocations and feeds will be used to support services that the RESA provides in conjunction with GREAT.

(B2) The relevance and demonstrated commitment of each partner to the implementation and success of the project.

The GREAT Partnership: A Shared Purpose

The purpose of our partnership is straightforward: To combine our capabilities and resources in ways that generate an impactful synergy so together we produce stronger outcomes than the partners could achieve working independently. To that end, the partnership is intended to facilitate close communication so each partner understands the goals, needs and constraints of the others and how their own resources can best be used to enhance outcomes for all. For example, the partners will conduct an analysis of the hiring needs of the districts to guide the recruitment of residents so the program will help the districts fill vacancies where teacher shortages exist and to supply teachers for schools that serve higher proportions of high-need students.

About the Partners

Georgia College and State University (GCSU) is a public liberal arts university located in Milledgeville, Georgia. GCSU was founded in 1889 and is part of the University System of Georgia. It currently enrolls approximately 7,000 students — roughly 6,000 undergraduate students and 1,000 graduate students. GCSU has been ranked by U.S. News & World Report as the 10th best public school in the south region, and as having the 5th best undergraduate teaching program in the region, as well as being ranked the #5 Most Innovative School in the region. GCSU's MAT program has a robust STEM concentration.

GCSU's most recent CAEP accreditation reports show it compares favorably with other educator preparation programs in the state. GCSU 2019 MAT program completers outperformed both state and national results on Pearson's edTPA teacher certification assessments, with GCSU averages of 48.8 for the Mathematics edTPA (compared with 45.3 for the state and 44.8 for the nation), and 48.4 for the science edTPA (compared with 46 for the state and 45.8 for the nation). The Middle Grades MAT program has had a 91 percent graduation rate since 2013 (74/81), and CAEP data show that 99 percent of GCSU's completers meet licensing requirements. 2018 College of Education graduates at GCSU have gone on to teach in 35 of Georgia's 159 counties.

Dr. Nancy B. Mizelle is a Full Professor of Middle Grades Education at Georgia College in Milledgeville, Georgia. She received her B.A. in English from Meredith College and M.Ed. in Reading Education from Clemson University and her Ed. D. in Elementary Education from the University of Georgia. She has spent more than 30 years teaching in public schools and higher education, including the last19 years in the Georgia College Middle Grades teacher preparation program. At Georgia College she also has served as Middle Grades Program Coordinator and Chair of the Department of Early Childhood and Middle Grades Education. Dr. Mizelle's research

focuses on young adolescents' motivation and literacy learning and middle level teacher preparation. She reviews for *Research in Middle Level Education, Middle Grades Research Journal* and *Middle School Journal,* as well as the Council for the Accreditation of Educator Preparation (CAEP)/Association for Middle Level Education (AMLE) Specialized Professional Association (SPA) and Georgia's Schools to Watch program.

Dr. Miriam Jordan, GC Science and Secondary Education Instructor, brings balanced experience to this endeavor. Holding degrees in biology and science education, with extensive 7-12 science teaching experience, she has investigated school culture/change in relation to effective science instruction; led a site-based school improvement team to implement a criterion-based scheduling innovation, successfully increasing engagement, attendance, and achievement across content areas. As a GaDOE science implementation specialist, she helped schools with struggling science programs make impressive gains in science scores. She coordinated the proposal and implementation for two Mathematics and Science Partnership grants and is currently working with the local middle school administrators and teachers to reorganize their STEAM program.

District Partners

The six districts that have agreed to partner in the GREAT project are all served by the Oconee RESA. Each of these districts serves a rural Georgia county, is the only district in the county, and each has a single grades 6-8 middle school. The partner districts and schools are: Baldwin County Public Schools (Oak Hill M.S.); Hancock County Schools (Hancock Central M.S.); Johnson County Schools (Johnson County M.S); Putnam County Charter School System [the district as a whole has a charter from the state] (Putnam County M.S.); Washington County Public Schools (T. J. Elder M.S.); Wilkinson County Schools (Wilkinson County M.S.). The schools range in size

from 254 (Hancock Central) to 1141 students (Oak Hill in Baldwin), and collectively serve 3252 students in grades 6-8. The partnership, including the roles and responsibilities of the parties as described in this narrative, was presented to the districts through the RESA, and the board of the RESA, comprised of the superintendents and their representatives, voted to participate, as described in the letter of support included in Appendix I. Districts have received and are in agreement with the sample MOU included in Appendix I.

C. Management Plan

The Management Plan shows important project tasks and activities and milestones. A timeline that displays the flow of activities across the five years of the project appears in Appendix J Other Documents.

Goal 1:	Develop and implement the GREAT Teacher Residency model, increasing the capacity of project partners to select and prepare highly qualified STEM teachers while using a continuous improvement process to make recommendations for revisions to implementation to maximize effectiveness.
Objectives	
1a. Establish a strong recruitment process and a competitive selection process.	
1b. Increase the capacity of the GCSU MAT program, especially in computer science.	
1c. Develop a comprehensive two-year induction program to follow the one-year residency.	
1d. SREB establishes statewide collaboration in support of teacher residency programs.	
1e. Improve the fidelity of implementation for subsequent cohorts	
1f. Development of high-quality, cost-effective partnerships	

Activity–**Key Milestones in Bold** *Frequency in Italics*	Objective(s)	Start	End	Responsibility
Draft/update an informational message for recruiting residents for use by universities and school districts in Georgia. *Repeat for each cohort.*	1a	10/16/2019	10/23/2019	Project Manager
Maintain open communications among partners to identify and proactively address issues and concerns related to the implementation of GREAT. *Repeat for each cohort.*	1e	10/16/2019	6/30/2025	All Partners
Review the implementation plan with all partners in a joint partner session. Obtain input and make revisions as appropriate. *Quarterly throughout the program.*	1f	10/16/2019	6/30/2025	Project Manager

Activity–**Key Milestones in Bold** *Frequency in Italics*	Objective(s)	Start	End	Responsibility
Integrate Code.org materials and activities into curriculum for ED 5202 Technology for Teachers.	1b	2/10/2020	3/20/2020	GCSU Faculty
Analyze MAT course content in terms of high-priority residency practices and suggest revisions; including additional classroom-based assignments.	1b	2/10/2020	4/30/2020	Joint GCSU + SREB
Make improvements to the GCSU STEM lab to upgrade capabilities for making demonstration videos of problem-based STEM lessons for viewing by GREAT residents and others.	1b	4/6/2020	5/22/2020	Joint GCSU + SREB
Advertise openings for Cohort 1, listing the required documentation and submittals. Collect applicant documents and conduct initial screening. *Repeat for each cohort.*	1a	2/10/2020	6/19/2020	District Contact
Review monitoring data to update partners on the progress of implementation and to identify issues early and take proactive preventive measures. *Quarterly throughout the program.*	1f	3/9/2020	6/30/2025	Project Manager
Review qualifications and submittals for candidates recommended by each district and select Cohort 1 residents. *Repeat for each cohort.*	1a	5/4/2020	5/29/2020	Joint GCSU + SREB
Process GCSU admission materials for Cohort 1 residents. *Repeat for each cohort.*	1a	6/17/2020	7/10/2020	GCSU
Review process and outcomes of initial selection process and suggest improvements for future cohorts. *Repeat after each selection process.*	1a, 1e	7/20/2020	7/31/2020	All Partners
Collect feedback from residents on course content and assignments; make revisions as appropriate for future cohorts. *Repeat for each cohort.*	1b	8/10/2020	12/10/2021	Joint GCSU + SREB
Convene partners to generate potential revisions to the structure and implementation of the residency. Incorporate lessons learned and suggested revisions into the implementation plan for the next cohort. *Repeat for each cohort.*	1e, 1f	9/7/2020	7/28/2023	All Partners
Collect and review data on the performance of mentors and residents; including observations by the coaches, performance on course assignments and input from the principal. *Repeat for each cohort.*	1e	9/7/2020	6/30/2025	All Partners

Activity–**Key Milestones in Bold** *Frequency in Italics*	Objective(s)	Start	End	Responsibility
Communicate Induction process timeline and expectations to residents, mentors and principals at schools where program completers will begin as teacher of record following the residency. *Repeat for each cohort.*	1c	2/22/2021	5/7/2021	District Contact
Form New Teacher Induction Teams (NTIT) and formulate a "learning plan" to guide and support continued growth of new teachers throughout the two-year Induction process. *During pre-planning each year; revised at end of first semester.*	1c	7/12/2021	8/13/2021	Mentors
Principals schedule mentor and new teacher into common planning time to facilitate continued support for the new teachers.	1c	8/9/2021	9/3/2021	District Contact
Mentors meet with new teachers at least once each week for 90 minutes to support lesson and unit planning; engage in problem-solving. *Throughout Induction process.*	1c	8/23/2021	5/27/2022	Mentors
Mentors ensure new teacher is appropriately involved in PLC and school improvement activities. *Throughout Induction process.*	1c	8/23/2021	5/27/2022	Mentors
Coaches continue supporting mentors and new teachers during the induction process. *Throughout Induction process.*	1c	8/23/2021	5/27/2022	Coaches
Monitor Induction process activities, collecting feedback from new teachers, mentors and principals; process feedback and share with District Contacts. *Repeat for each cohort as they become teachers of record.*	1c, 1e	8/23/2021	5/27/2022	Project Manager
Incorporate recommended revisions to the Induction process. *Repeat for each cohort.*	1c, 1e	6/7/2022	8/19/2022	District Contact
Conduct quarterly statewide networking meetings where information and resources are disseminated to various stakeholder groups (e.g. LEA's, teacher prep programs). *During Years 4 and 5 of the project.*	1d, 1f	6/7/2022	6/28/2024	Project Manager

Goal 2:	Increase the supply of well-prepared novice teachers with a background in STEM fields entering the teaching workforce in high-needs districts in Georgia.
Objectives	
2a. Using a residency program with a 90% completion rate, prepare three cohorts of 20 new teachers. [60 participants selected, 54 completers allowing for 10% attrition]. (GPRA 1, 2 &3)	
2b. At least 25% of program completers will be specifically certified to teach computer science. (GPRA 2)	
2c. Retention of teachers who have completed the residency program will match or exceed retention rates for novice teachers prepared by traditional programs. (GPRA 4 & 5)	

Activity–**Key Milestones in Bold** *Frequency in Italics*	Objective(s)	Start	End	Responsibility
Train mentors in evidence-based mentoring strategies. *Repeat for new mentors prior to start of next cohort.*	2a, 2c	1/20/2020	8/7/2020	Coaches
Provide mentors access to Mentor Modules and other mentor training materials including selected articles. *Repeat for new mentors prior to start of next cohort.*	2a, 2c	1/20/2020	5/31/2021	Coaches
Monitor quality of residents' assignments and report any issues to the relevant coach and university supervisor. *Repeat for each cohort.*	2a	6/8/2020	8/13/2021	GCSU Faculty
Track performance issues and other concerns that might impact retention of residents; address issues promptly with appropriate action plans to support residents who might be struggling. *Repeat for each cohort.*	2a, 2c	7/6/2020	6/30/2021	All Partners
Confer with principal during on-site coaching visits to obtain feedback on resident and mentor performance. *Repeat for each cohort.*	2a	8/10/2020	5/31/2021	Coaches
Identify residents who are interested in pursuing computer science certification and arrange for additional coursework and/or other professional development activities to meet state certification requirements. *Repeat for each cohort.*	2b	8/10/2020	6/30/2021	Coaches
Provide professional development for residents pursuing certification in computer science.	2b	8/10/2020	6/30/2021	Coaches

Activity–**Key Milestones in Bold** *Frequency in Italics*	Objective(s)	Start	End	Responsibility
Monitor residents use of Code.org materials and provide coaching support for residents pursuing certification in computer science. *Repeat for each cohort.*	2b	8/10/2020	6/30/2021	Coaches
Review mentor/resident relationships and reassign mentors if necessary. *Repeat for each cohort*	2a, 2c	8/12/2020	9/1/2020	Coaches
Schedule and conduct on-site and virtual coaching visits. *Repeat for each cohort.*	2a	8/24/2020	6/30/2021	Coaches
Train mentors and residents in use of video recording equipment, including how to upload videos for review. *Repeat for each cohort.*	2a	9/7/2020	9/30/2020	Coaches
Provide training and support for STEM-related instructional practices (e.g., project-based learning) during coaching visits. *Repeat for each cohort.*	2a	9/7/2020	5/31/2021	Coaches
Ensure mentors and residents are uploading video recordings of classroom instruction as planned. *Repeat for each cohort.*	2a	10/1/2020	5/31/2021	Project Manager
Provide feedback on video recordings of classroom instruction. *Repeat for each cohort.*	2a	10/1/2020	5/31/2021	Coaches
Conduct a progress check on residents who are seeking the computer science endorsement; determine status and next steps. *Repeat for each cohort.*	2b	2/15/2021	3/12/2021	Coaches
Provide a comprehensive induction process to support new teachers from all three cohorts. in the first two years of their teaching career. *Throughout the Induction Process.*	2c	8/16/2021	6/14/2024	All Partners

Goal 3:	Improve middle grades student achievement in science, mathematics, and reading, and increase students' awareness of and interest in STEM careers and computer science.
Objectives	
3a. The students of GREAT teachers will meet or exceed district and state *proficiency* results on End of Grade assessments. (GPRA 6)	
3b. The students of GREAT teachers will meet or exceed district and state averages for *student growth* for their grade levels. (GPRA 6)	
3c. Students will possess a greater awareness of computer science fields and an increase in their intention to persist in course-taking in a computer science related field in high school.	

Activity–**Key Milestones in Bold** *Frequency in Italics*	Objective(s)	Start	End	Responsibility
Provide instruction and assignments in MAT courses that are closely aligned with the clinical experience of the residents. *Repeat for each cohort.*	3a, 3b	6/8/2020	8/13/2021	GCSU Faculty
Observe residents' classroom instruction during on-site coaching visits and through video recordings of instruction and provide feedback on the residents' use of evidence-based instructional practices. *Repeat for each cohort.*	3a, 3b	8/24/2020	6/11/2021	Coaches
Monitor residents' use of high-priority residency practices as identified on the crosswalk and provide feedback as appropriate. *Repeat for each cohort.*	3a, 3b	8/24/2020	6/11/2021	Coaches
Provide feedback on residents' use of Code.org materials and other classroom activities that support increasing students' interest in computer science. *Repeat for each cohort.*	3c	8/24/2020	6/11/2021	Coaches

D. Project Evaluation

The plan for data analysis embedded in this project includes both a process evaluation as well as an outcome evaluation and analyses for each are described under separate headings below. Observed outcomes are often mediated by the fidelity with which an intervention is implemented so it is extremely important to document and analyze this process (e.g. formative) along with the expected outcomes (e.g., summative). The process evaluation will include analysis of data related to the fidelity of implementation, and feasibility of the resources developed and field tested in Years 1-2, where the outcome (summative) evaluation will continue to measure fidelity of implementation, along with teacher effectiveness, teacher retention and certification, and student achievement during Years 3-5.

(i) The methods of evaluation will provide valid and reliable data on relevant outcomes.

Process Evaluation (Objectives 1a,1b,1c,1d)- This portion of the evaluation is based, in part, on Guskey's (2000) model for the evaluation of professional development interventions which includes five distinct levels designed to "recognize the various factors that influence the relationship" between professional development activities and changes in student outcomes (p.78). Semi-annual site visits and periodic brief surveys of teachers' and mentors' perceptions will provide useful formative data for project staff, and will be summarized in quarterly updates and detailed annual reports provided by the evaluation team. Intervention fidelity measures will be developed in Year 1, consistent with guidelines used throughout the field of educational interventions. (Nelson et al., 2012) Initial satisfaction ratings will be used to improve program delivery and design. Guskey's Level 4 - "Participant use of knowledge and skills" - is used to document and improve upon the implementation of PD content to facilitate participants' effective use of new knowledge and skill. Data collected from classroom observation measures and teacher

interviews will be used to inform program content and structure. Qualitative data on the "actor-oriented perspective" (Penuel et al., 2011) will be collected to document the instructional decisions teachers make as they apply the PD and adapt the feedback to their classroom practice. In addition, studying "*teachers' unanticipated interpretations of curriculum purposes and structures are useful for redesigning embedded support for teacher learning and PD*" (p.756). Data will be collected via interviews on how teachers engage with the professional development support, and the fidelity with which they make use of the strategies. This data will be used by the project mentors and SREB coaches, to design and shape the residency's coaching content and video feedback structure to best meet the needs of the GREAT teachers.

Outcome Evaluation– A portion of the outcome evaluation focusing on student achievement outcomes will utilize a quasi-experimental design by selecting matched comparison teachers from within the same district (or region, if district is small) as each of our GREAT participants. This design will meet WWC evidence standards, and also meet Tier 2 ESSA standards for **'moderate evidence'**. The portion of the outcome evaluation focused on other teacher and student outcomes will utilize correlational analyses and should meet Tier 3 ESSA standards for '**promising evidence'**. Each portion is described separately below.

***Data sources for Quasi-experimental (between groups)* analysis (Objectives 3a & 3b)**:

Data collected will measure domains specified in the evidence review protocol for *Teacher Training, Evaluation and Compensation – Version 3.1* published by the U.S. DOE's What Works Clearinghouse in 2015. This document is a guide for researchers measuring the effects of professional development interventions such as ours.

Student achievement in math and science - The Georgia Milestones End-of-Grade (EOG) Assessment is the state-required annual ESSA assessment administered to every grade level 3rd-8th

in Math and administered to grades 5th and 8th in Science. The Georgia Milestones End-of-Course (EOC) Assessment is administered in courses for which students can earn high school credit. In some districts, courses such as high school Algebra I and high school Physical Science or Biology may be offered to 8th grade students who would be required to complete the EOC assessment. In these cases, we will use the EOC assessment to measure student outcomes. The high stakes nature of these tests will ensure their validity and reliability as well as the integrity and consistency of administration across multiple sites. For both project and comparison teachers, data will be reported in terms of proficiency levels and scale scores. Because a vertical scale does not exist across grade levels for these Georgia assessments, and the GREAT teacher residents will each be assigned to different grade levels during the induction period, it is important to generate *z*-scores based on the state mean and standard deviation for each test and grade level. The evaluators will also verify that the project and control students do not differ by more than ¼ of the pooled standard deviation (e.g. Hedges' g <.25) in order to establish baseline equivalence and determine whether an adjustment is necessary in the outcome analysis to account for pre-intervention differences between project and comparison groups in the analytic sample. As stated above, the comparison group will be comprised of students who are assigned to similarly experienced teachers who have not participated in the residency program. Hierarchical linear modeling will be used to account for the clustered nature of the students. Level 2 (teacher) covariates will include treatment status, along with years of experience, where Level 1 (student) covariates will include a dichotomous measure of economic disadvantage, and (where necessary) prior year's *z*-score on same subject assessment to adjust for any pre-intervention differences in ability.

****Student growth percentile***s – Georgia DOE utilizes a student growth model and provides student growth percentiles (SGP) for each student in each subject area tested each year. SGPs describe the

amount of growth a student has demonstrated relative to academically-similar students from across the state. SGPs are statistical, regression-based quantities used to characterize the growth of students on state-mandated assessments by creating growth norms that model the relationship between students' current and prior achievement scores. Growth percentiles range from 1 to 99, with lower percentiles indicating lower academic growth and higher percentiles indicating higher academic growth. With SGPs, all students – regardless of their achievement level – have the opportunity to demonstrate all levels of growth. The percentiles are also grouped into one of three categories: low, typical and high growth. This will enable us to aggregate student growth scores to the teacher level and use them as a measure of teacher performance, in terms of the proportion of students making typical or high growth, as well as the median growth percentile for each teachers, as reflected in Objective 3b. In years 3-5 of the grant, this information will be aggregated to the teacher level to determine whether students assigned to GREAT project teachers show stronger growth each year compared to students assigned to non-project teachers in the same district or region. The GaDOE only reports students' growth percentiles associated with Math assessments so we would not be able to complete this analysis for 8th grade Science assessments.

Data sources for correlational or descriptive analysis (within groups):

Teachers' pedagogical and content knowledge **(Objective 2a)** -- This project will carefully document the progress of GREAT residents through the M.A.T. program at GCSU, credits earned and assessment outcomes. **(GPRA 3)** Two standardized assessments required for certification in Georgia are the EdTPA and the GACE. Scores on these tests will be carefully documented as well since they are integral to the achievement of two performance measures. **(GPRA 1 & 2)** The Georgia Professional Standards Commission has established an edTPA passing standard for Middle Grades Math and Middle Grades Science; the passing score is 38. Stanford Center for

Assessment, Learning, and Equity (SCALE) developed edTPA. The validity of the instrument has been well-established through substantive advice and feedback from teachers and teacher educators. The design and review teams have included hundreds of university faculty, national subject-matter organization representatives (e.g., NCTM, NCTE, NSTA, etc.), and K–12 teachers. edTPA is a performance-based, subject-specific assessment used by teacher preparation programs throughout the U.S. to emphasize, measure and support the skills and knowledge that all teachers need from Day 1 in the classroom. The assessment features a common architecture focused on three tasks: Planning, Instruction, and Assessment. edTPA requires aspiring teachers to demonstrate readiness to teach through lesson plans designed to support their students' strengths and needs; engage real students in ambitious learning; analyze whether their students are learning, and adjust their instruction to become more effective. Teacher candidates submit unedited video recordings of themselves at work in a real classroom as part of a portfolio that is scored by highly trained educators. edTPA builds on decades of teacher performance assessment development and research regarding teaching skills and practices that improve student learning. Georgia Assessment for the Certification of Educators® (GACE) is Georgia's state-approved educator certification assessment program. The purpose of the GACE is to help the Georgia Professional Standards Commission (GaPSC) ensure that candidates have the knowledge and skills needed to perform the job of an educator in Georgia's public schools. These computer-delivered assessments have been developed by the GaPSC and Educational Testing Service (ETS).

***Teachers' Sense of Efficacy (Objective 1c) –** The Teachers' Sense of Efficacy Scale (TSES) is designed to see what creates the most difficulties for teachers in daily school activities. (Tschannen-Moran & Woolfolk, 2001) This is an important construct to measure as recent research has shown that "contextual factors such as the teaching resources and interpersonal

support available were found to be much more salient in the self-efficacy beliefs of novice teachers." (Tschannen-Moran & Hoy, 2007) This widely used, empirically validated survey will be administered to each GREAT resident at least three times during the grant in order to measure trends over time – pre-residency, post-residency and at the end of their 1st year of induction. Where possible within the grant timeframe, we will administer it again to Cohorts 1 & 2 at the conclusion of the 2nd year of their induction program. Three moderately correlated factors have been consistently found in the TSES**.** These are teachers' efficacy in: Student Engagement, Instructional Practices, and Classroom Management.

****Employment retention*** – **(Objective 2c, GPRA 4 & 5)**- Descriptive statistics will be reported on teacher retention among our GREAT teachers, as well as other novice middle school teachers in these same districts and regions. Personnel records will provide accurate data on which teachers remain in the same school or transfer to another school within the district. Though GREAT teachers will commit to remaining in their district for a minimum of three years as a condition of their participation in the residency, we will maintain accurate records documenting cases of attrition and specify reasons when/if any residents leave the program before the end of the residency or during the induction program.

****Students' STEM engagement*** **(Objective 3c)** - Students will also complete the *Student Attitudes Toward STEM* (S-STEM) survey designed to measure changes in students' confidence and efficacy in STEM subjects, 21st century learning skills, and interest in STEM careers. (Friday Institute, 2014) A 2-page document detailing the extensive validity evidence and reliability (i.e. Cronbach's alpha) for each construct ranging from .84 to .91 is provided in Appendix J. The S-STEM survey invites students to give information about their attitudes toward science, technology, engineering, and mathematics subjects, postsecondary pathways, self-assessment of

their aptitude in STEM courses, and their STEM-related career interests. T-tests will be used to measure changes from pre to post within students assigned to GREAT teachers during a given school year. S-STEM surveys will also be administered to students in math/science courses taught by non-participating teachers to determine whether there is a correlation between a teacher's participation in the GREAT project and larger increases in their students' STEM engagement.

(ii) The methods of evaluation are thorough, feasible, and appropriate to the goals, objectives, and expected outcomes of the proposed project.

<table>
<tr><td>Goal 1:</td><td colspan="2">Develop and implement the GREAT Teacher Residency model, increasing the capacity of project partners to select and prepare highly qualified STEM teachers while using a continuous improvement process to make recommendations for revisions to implementation.</td></tr>
<tr><th>Objectives</th><th>Formative Evaluation methodology</th><th>Timeline</th></tr>
<tr><td>1a. Establish a strong recruitment process and a competitive selection process.</td><td rowspan="2">*Through semi-annual site visits, quarterly project meetings and interviews with GREAT residents, qualitative analysis will be used to identify barriers and accelerators to implementation.
*Counts of applicants will be tracked to support recruitment efforts</td><td rowspan="2">Beginning in Spring 2020 thru end of Year 2 of the grant</td></tr>
<tr><td>1b. Increase the capacity of the GCSU MAT program, especially in computer science.</td></tr>
<tr><td>1c. Develop a comprehensive two-year induction program to follow the one-year residency.</td><td>Fidelity index will be created to measure the quality of the induction program designed in each district. Data will be used to inform project staff about support needed to improve induction program delivery. Interviews with GREAT teacher inductees will also be used.</td><td>Site visits annually in Yrs 3-5</td></tr>
<tr><td>1d. SREB establishes statewide collaboration in support of teacher residency programs.</td><td rowspan="3">*Stakeholder surveys will be used to collect data on perceived strengths and weaknesses across multiple cohorts, through descriptive statistics and thematic analysis of open-ended items. (Boyatzis, 1998)
* PRISM rubric will be used to measure the depth and quality of the partnerships between SREB, GCSU and partner districts. (see Appendix J for further description)</td><td rowspan="3">Surveys to all stakeholder groups beginning end of Yr 2 (Fall 2021);
PRISM rubric administered annually in January</td></tr>
<tr><td>1e. Improve the fidelity of implementation for subsequent cohorts</td></tr>
<tr><td>1f. Development of high-quality, effective partnerships</td></tr>
</table>

Goal 2:	Increase the supply of well-prepared novice teachers with a background in STEM fields entering the teaching workforce in high-needs districts in Georgia.	
Objectives	**Summative Evaluation methodology**	**Frequency**
2d. Prepare three cohorts of 20 new teachers. [60 participants selected, with < 10% attrition]. **(GPRA 1, 2 &3)**	*Degree completion at GCSU documented by artifact analysis, transcript evaluation. *Residency completion will be documented through a checklist of required components, completed through site visits and interviews with mentors and project staff.	Ongoing throughout Years 2, 3, and 4
2e. At least 25% of program completers will be specifically certified to teach computer science. **(GPRA 2)**	Descriptive statistics on the # of residents meeting state certification requirements for the Computer Science endorsement.	Annually, beginning of Yrs 3-5
2f. Retention of teachers who have completed the residency program will match or exceed retention rates for novice teachers prepared by traditional programs. **(GPRA 4 & 5)**	Personnel records will be used to calculate retention rates of program completers compared with regional and district data for all novice teachers entering the teaching workforce	Annually in Yrs 2-5

Goal 3:	Improve middle grades student achievement in science, mathematics, and reading, and increase students' awareness of and interest in STEM careers and computer science.	
Objectives	**Summative Evaluation methodology**	**Frequency**
3d. The students of GREAT teachers will meet or exceed district and state *proficiency* results on End of Grade assessments in math and science. **(GPRA 6)**	*Longitudinal analysis of scale scores and performance levels to measure improvement over time within treatment group *Binary logistic regression using proficiency levels to determine whether treatment students have higher likelihood of achievement proficiency then students assigned to comparison teachers.	Annually, beginning in year 3
3e. The students of GREAT teachers will meet or exceed district and state averages for *student growth* for their grade levels. **(GPRA 6)**	*Longitudinal analysis of student growth percentiles to measure improvement over time within treatment group *Binary logistic regression using growth levels (low, typical or high) to determine whether treatment students have higher likelihood of showing "high" growth then students assigned to comparison teachers.	Annually, beginning in year 3
3f. The students of GREAT teachers will show increased awareness of STEM fields and demonstrate an increase in their intention to persist in course-taking in a computer science field	Each year, students will report at least a 10% increase in mean scores for STEM attitudes and career interest based on the *S-STEM* Survey (Friday Institute, 2014)	Semiannually (pre/post) in Yrs 3-5

Table 4. GPRA Performance Measures included in the evaluation plan

GREAT Resident COHORT	***1***	***2***	***3***
School Year completing residency	***2020/21***	***2021/22***	***2022/23***
Performance Measure 1: Certification/Licensure. The percentage of program graduates who have attained initial State certification/ licensure by passing all necessary licensure/ certification assessments (i.e. edTPA, GACE) within one year of program completion.	X	X	X
Performance Measure 2: STEM Graduation. The percentage of math/science program graduates that attain initial certification/licensure by passing all necessary licensure/certification assessments within one year of program completion.	X	X	X
Performance Measure 3: One-Year Persistence. The percentage of program participants who were enrolled in the postsecondary program in the previous grant reporting period, did not graduate, and persisted in the postsecondary program in the current grant reporting period.	X	X	X
Performance Measure 4: One-Year Employment Retention. The percentage of program completers who were employed for the first time as teachers of record in the preceding year by the partner high-need LEA and were retained for the current school year.	X	X	
Performance Measure 5: Three-Year Employment Retention. The percentage of program completers who *were employed* by the partner high-need LEA for three consecutive years *after initial employment.*	X	X	
Performance Measure 6: Student Learning. The percentage of grantees that report improved aggregate learning outcomes of students taught by new teachers.	X	X	X

References cited in this proposal can be found in Appendix J Other Documents.