University at Buffalo Teacher Residency Program (UBTR) Proposal

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GLOSSARY OF ACRONYMS

BPS – Buffalo Public Schools
BTF – Buffalo Teachers Federation (teacher union)
CAEP – Council for the Accreditation of Educator Prepaation
CAS – College of Arts and Sciences (at UB)
CDO – Chief Diversity Officer
CST – Content Specialty Test
CTSA - Buffalo Clinical and Translational Science Award
DASA – Dignity for All Students Act
EAS – Educating All Students Test
Ed.M. – Master of Education degree
edTPA – Teacher Performance Assessment required for licensure in New York and other states
ELA – English language arts
ESAAF - ETS Earth Science Assessments with Automated Feedback
ETS – Educational Testing Service
FIR – Faculty in Residence
GPRA - Government Performance and Results Act
GSE – Graduate School of Education (at UB)
HR – Human Resources
IHE – Institute of Higher Education
ISI – Interdisciplinary Science Inquiry
ITTIC - Institute on Trauma and Trauma-Informed Care
LEA – Lead Education Agency
LGBT – Lesbian, Gay, Bisexual, Transgender
MT – Mentor Teacher
NIH – National Institutes of Health
NSF – National Science Foundation
NTC – Santa Cruz New Teacher Center
NYS – New York State
NYSED – New York State Education Department
NYSUT – New York State United Teachers
PLC – Professional Learning Community
PD – Professional Development
SASS - National Center for Educational Statistics School and Staffing Survey
SC – Specialist Coach
STAR - Student Teacher Assessment Record
STEM – Science, Technology, Engineering, Mathematics
STEM+C – Science, Technology, Engineering, Math and Computer Science
STEVAL – Student Teacher Evaluation

SUNY – State University of New York
TEA – Teacher Education Associate
TEAC –Teacher Education Accreditation Council
TQP – Teacher Quality Partnership
TR – Teacher Resident
TSES - Teachers' Sense of Efficacy Scale
UB – University at Buffalo, State University of New York
TRSI – Teacher Residency Summer Institute
UBSSW – University at Buffalo School of Social Work
UBTC – University at Buffalo Teacher Residency Consortium
UBTN – University at Buffalo Teacher Network
UBTR – University at Buffalo Teacher Residency
USDOE – United States Department of Education
UTRU – Urban Teacher Residency United

PROPOSAL NARRATIVE

PART ONE

ABSTRACT

Project Title: University at Buffalo Teacher Residency (UBTR) Program

Priorities Addressed: **Absolute Priority 2:** Partnership Grants for the Establishment of Effective Teacher Residency Programs;**Competitive Preference Priority 1**:Promoting Science, Technology, Engineering, and /or Math (STEM);**Competitive Preference Priority 2**: Promoting Effective Instruction in Classrooms and Schools.

Project Goals and Expected Outcomes: The goals of this initiative are to: 1) Increase the number of learner-ready teachers in the city of Buffalo; 2) Diversify the pool of teachers in the city of Buffalo; and 3) Increase the number of teachers who stay in the teaching profession for a minimum of 5 years. The expected outcomes of this project are to increase student achievement by improving the preparation of teachers and to foster the creation of a culture of collaborative

professionalism that will improve student performance, enhance school leadership, increase teacher retention, and strengthen school-community engagement.

Brief Project Description: Consistent with models of successful teaching residencies, we propose to accomplish these goals by: 1) Establishing a 1-year teacher residency program that embeds the resident as co-teacher in a classroom setting for sustained, authentic teaching experiences as they earn state certification and a master's degree through New York State (NYS) approved programs; 2) Developing a Teacher Residency Summer Institute (TRSI) and a UBTR Consortium (UBTC) to provide initial and ongoing support for residents and all supporting personnel, including teachers and principals; and 3) Offering a paid stipend to all residents during their residency.

Target Number of Project Participants: This project will support 50 teacher residents (TRs), with the plan to support sustainable cohorts of 15-25 per year after the grant ends.

Number of Teacher Residents				
2018-19 (Planning year)	2019-20	2020-21	2021-22	2022-23
0	10	10	15	15

Key Partner Organizations: Along with the Buffalo Public Schools (BPS), key partners include the Graduate School of Education and the College of Arts and Sciences in the University at Buffalo, State University of New York.

PRIORITIES

<u>Absolute Priority 2</u>: Partnership Grants for the Establishment of Effective Teacher Residency Programs

This project involves the design and establishment of a University at Buffalo Teacher Residency program (UBTR), which involves preparation of prospective and new teachers with strong teaching skills through: 1) the creation of a model teaching residency program for individuals with strong academic and/or professional backgrounds but without teaching experience; 2) implementation of an innovative program that will ensure that participants earn a Master's degree plus NYS teaching certification within 12 months; 3) providing participants who complete application and induction requirements with living stipends for 12 months in exchange for an agreement to teach in a high-need Buffalo public school for three years.

Competitive Preference Priorities

This project meets the criteria for consideration in each of the three Competitive Priorities.

Competitive Preference Priority 1: **Promoting Science, Technology, Engineering, and /or Math (STEM)**

Teacher education programs, like UBTR, play a critical role in preparing knowledgeable educators who can draw upon the trans-disciplinary nature of computational thinking to educate their students (National Research Council, 2010). Preservice teacher education is an optimal time to develop future teachers subject matter and pedagogical knowledge necessary to successfully integrate computational thinking, including computer science, into the teaching and learning of science, technology, engineering, and/or math (STEM) (Yadav, Stephenson, & Hong, 2017).

Our innovative approach to professional development for science, technology, engineering and mathematics will include infusing the teaching of computer science

principles, including computation thinking, with a STEM + C model. Embedding the teaching of computer science in curriculum of STEM disciplines affords the teachers the opportunity to be proficient in both computer science and their discipline (Yadav, Stephenson, & Hong, 2017). The professional development for the STEM + C will be sustained across the year using varied professional development contexts: (1) summer workshops/seminars outside of the classroom; (2) virtual online modules during the school year; and (3) monthly ongoing sustained professional development centered on classrooms. We envision interdisciplinary STEM + C teams collaboratively learning and designing together in professional learning communities (PLC). Below we highlight STEM professional development in section 4a. and the infusion of computer science across the STEM disciplines in section 4b.

4a. STEM-The UBTR professional development model for STEM is rooted in the evidenced-based practices (e.g., Banilower, Heck, & Weiss, 2007; Blank, de las Alas, & Smith, C, 2007; Borko, 2004; Diamond, Maerten-RIvera, Rohrer, & Lee, 2004; Yank, Liu, & Gardella, 2018). Essential to teaching all STEM disciplines is a depth of subject matter knowledge in science, technology, engineering and/or math and the knowledge required to make the subject matter accessible to the students, often referred to as pedagogical content knowledge (Shulman, 1986). Both types of knowledge are critical components of teacher competences that impact student achievement (e.g., Diamond, Maerten-Rivera, Rohrer, & Lee, 2014). Pedagogical content knowledge emanates from three other knowledge basis: (a) subject matter knowledge; (b) pedagogical knowledge, and (c) knowledge of the context (e.g., community, school and student background). The job of a teacher is to transform the subject matter knowledge into instruction delivered to

their students in relevant and meaningful ways using their pedagogical content knowledge. The residency model, unlike the traditional semester long student teaching model, provides a sustained supportive context for the development of each component needed to advance novice teachers knowledge in each area; refining their understanding across multiple iterations. Professional development programs that are intensive and are short in duration are less effective than those that are 150 hours per year or more, thus supporting the idea that a certain amount of professional development is needed to show effects on student achievement (Yang, Liu, & Gardella, 2018).

4 b. Computer Science Our professional development model infuses the teaching of computer science principles into the STEM Disciplines (STEM+C). By taking a STEM + C approach, our residents and their students will have the opportunity to acquire a deeper understanding of computing in the world around them, solve real problems and understand human behavior through computer science concepts (PCAST, 2010). We know that a fundamental component of residency models, like UBTR, is sustained experience in the field. Research indicates that teachers who receive 49 hours of research based professional development spread over 6-12 months increase student achievement by 21 percentile points (Yoon, Duncan, Lee, Scarloss, & Shapley, 2007). Conversely, short professional development experiences lasting less than 14 hours demonstrate no significant effect on student learning (Darling-Hammond, Wei, Andree, Richardson, & Orphanos, 2009). This research points to the importance of having a sustained duration o professional development, which is the cornerstone of the UBTR model. With the goal o aligning with evidence-based practices all phases on professional development on-going support will be provided in the following areas to support the STEM+ C model:

- Providing time for residents and mentors to identify areas in their curriculum that works synergistically with the computer science curricula
- Assisting residents and mentors in draw connections between computer science principles and core curricular standards
- Providing active learning strategies, hands-on learning, and opportunities to for teachers to experience computer science activities in a supportive and collaborative learning environment (e.g., Braaten, & Perez, 2017; Cobb, 2001).

Competitive Preference Priority 2: **Promoting Effective Instruction in Classrooms and Schools**

This project specifically targets both aspects of this competitive preference priority in that it is designed to support the recruitment and retention of highly effective educators with explicit attention to increasing diversity in the teaching workforce of the Buffalo Public Schools. Program goals (increase the number of learner-ready teachers in the city of Buffalo, diversify the pool of teachers in the city of Buffalo, increase the number of teachers who stay in the profession for at least five years) demonstrate commitment to this competitive preference. A key tenet of successful teacher residency models involves attention to the development of prospective teachers from program application through orientation, during their residency, and into their teaching careers (Guha, R., Hyler, M.E., & Darling-Hammond, L., 2016;) .

Program recruitment will focus on cultivating a pipeline of excellent teachers whose demographic characteristics reflect the schools and communities where they will teach. Recruitment activities will focus on selecting candidates to create cohorts that are racially and ethnically diverse. To enhance instructional effectiveness, UBTR participants will

benefit from an innovative approach to program coursework involving modular engagement with content related to real-time instructional needs. Mentor teachers (MT) and specialist coaches (SC) will be prepared to provide feedback through the evidence-based model designed by the St. Cloud Academy for Co-Teaching and Collaboration. Additional program components related to teaching effectiveness include a systematic approach to professional development that involves MTs, SCs, TRs, school leaders, and university faculty addressing context-specific needs of learners through the creation of a culture of collaborative professionalism (Hargreaves & O'Connor, 2018). To improve instruction and increase retention, program alumni will benefit from five years of post-licensure professional development provided, in virtual and face-to-face formats, through the UBTR Consortium (UBTC).

Competitive Preference Priority 3: Novice Applicants

This proposal is submitted by an applicant that 1) has never received a grant or subgrant from this program; 2) has never been a member of a group application, submitted in accordance with 34 CRF 75.127-75.129, that received a grant under this program; and 3) has not had an active discretionary grant from the Federal Government in the five years prior to June 26, 2018.

I. QUALITY OF PROJECT SERVICES

Introduction and Background to the Partnership and Its Work

The UBTR proposal builds on collaborative partnerships as represented through successful national models and local initiatives. The goals of this initiative are as follows: 1) Increase the number of learner-ready teachers in the city of Buffalo; 2) Diversify the pool of

teachers in the city of Buffalo; and 3) Increase the number of teachers who stay in the teaching profession for a minimum of 5 years.

Consistent with models of successful teaching residencies, we propose to accomplish these goals by: 1) Establishing a 1-year teacher residency program that embeds the TR as co-teacher in a classroom setting for sustained, authentic teaching experiences; 2) Developing a residency Summer Institute (TRSI) that provides initial and ongoing support for residents, MTs, SCs, and building principals; and 3) Offering a paid stipend to all residents during their residency.

To ensure that the residency addresses the needs of high-needs Buffalo public schools, subjects and areas of certification of residency participants will be determined collaboratively, through intensive recruitment and selection processes developed along with BPS personnel. Currently, all programs for which the University at Buffalo (UB) offers certification are included in the residency program. This includes early childhood, elementary, middle and high school and a comprehensive range of subjects and disciplines. Although progress will be facilitated by attending to predetermined formative and summative assessment benchmarks, TRs who fail to complete the program or do not fulfill the agreement to teach in BPS schools for 3 years will be contractually obligated to repay, with interest, the stipends they received to support their residency.

During the preparation program and after completion, participants will be placed in cohorts that facilitate collaboration among peers and colleagues, as well as expert MTs[1], SCs, university faculty, and school administrators. Systemic collaborative professional development will be supported through the innovative UBTR Consortium (UBTC), which will support

[1] Mentor teachers will meet the criteria to be expert teachers who, according to the National Center for Teacher Residency are defined as a teacher who performs in the top 30% of her/his school or district.

preservice and practicing teachers and administrators at all levels of development by creating a culture of continuous improvement (Bacharach, Heck., & Dahlberg, 2012).

. The consortium will enable educators to collaborate on inquiry-based, data-driven investigations of real-time instruction that will center on student learning through Collaborative Professionalism (Hargreaves & O'Connor, 2018).

Through a variety of modes and formats on an ongoing basis, residents, program alumni, MTs, SCs, and administrators in participating schools will engage in activities designed to facilitate the development of a culture of Collaborative Professionalism (Hargreaves & O'Connor, 2018). Proven to be a "deeper and more rigorous form of professional collaboration" (1), research demonstrates that collaborative professionalism "boosts student achievement, increases teacher retention, and enhances the implementation of innovation and change" (1). Built on key tenets that include collective conceptions of autonomy, efficacy, inquiry, responsibility, and initiative, as well as mutual dialogue, joint work, and a common meaning and purpose, collaborative professionalism has the additional advantage of involving collaboration with students and big picture thinking with all stakeholders. Furthermore, collaborative professionalism supports the application of evidence-based practices with multiple forms of data, and builds collaboration within schools as well as across schools systems. It is a recursive process of continuous improvement that centers the work of teachers and school leaders, alongside of students, parents, and community members, to create context-specific approaches to educational transformation grounded in student performance. This concept of Collaborative Professionalism will serve as the theoretical framework and provide guiding principles for the UBTC.

The University at Buffalo and Buffalo Public Schools enjoy a shared vision for working together to improve opportunities for students, as exemplified by existing partnerships with the School of Dental Medicine, the School of Social Work, and the School of Engineering. Since 2013, the UB School of Dental Medicine has been a school-based dental health provider to the Buffalo Public Schools. This school-linked program referred to as the "Gateway" program, operates five days a week at Squire Hall. School buses bring approximately 15 children, who have parent/guardian permission, to the dental clinic each morning where they receive oral health treatment along with health education. Children return for subsequent visits if required. This past year, 400 children, largely from the 2nd and 3rd grades in ten Buffalo Public Schools and two Buffalo Charter Schools received treatment within the Gateway program, which recorded 615 dental visit encounters. Additionally, the School of Dental Medicine holds a Smile Education Day each year. All first and second year dental students visit local elementary schools within Erie County to speak with the children on the importance of good oral health and provide them with home dental kits. This past year dental students visited ten Buffalo Public Schools and provided training to over one thousand students primarily from the third and fifth grade. Finally, dental students actively participate on the City of Buffalo's Operation Clean Sweep and representatives from the School of Dental Medicine serve on the BPS Dental Health Committee.

The University at Buffalo School of Social Work (UBSSW) also has a strong commitment to the Buffalo Public Schools (BPS), as demonstrated through numerous initiatives and partnerships. The UBSSW Field Education Department has a long history of partnership with BPS. School social workers in the district have consistently provided high quality field practicum experiences for our students, with an average of 21 MSW students placed with the district each year. The UBSSW Institute on Trauma and Trauma-Informed Care (ITTIC) has

completed substantive work with BPS, including development of a mentor team with teachers, staff and parents at a district multi-age school (preschool through Grade 8) to increase awareness of trauma/adversity, and to begin to help facilitate a trauma-informed change process within the school. The ITTIC also provided 22 hours of training and consultation around trauma, trauma-informed care and treatment considerations for student trauma to a large group (~120) of BPS psychologists and social workers. Additionally, ITTIC representatives provided 10 hours of training to the BPS high school and elementary school wellness team members. The UBSSW has worked with the BPS to incorporate items from the Adverse Childhood Experiences Survey into the biennial Youth Risk Behavior Survey (administered to all middle and high school students). This ongoing project is tied to helping the district develop responses to risks identified in the survey. Moreover, individual UBSSW faculty members have completed work with BPS that involves: data analysis from the Youth Risk Behavior Survey, specifically looking at the health risk behaviors of high school youth identified as LGBT (this commenced in 2013, and ongoing); a pilot project to implement a 1:1 tablet program in a district elementary school, focused on family engagement and mutually beneficial school-family relationships; a local partnership to explore best practices for family engagement (by interviewing Family Support Specialists {FSS} and parents/caregivers); a current study that will determine how past parent organizing efforts helped to influence change in the BPS school board membership (the study findings will be used to inform other types of parent organizing for educational reform); a UBSSW student-led year-long program evaluation project for a district elementary school, focused on their restorative justice practice; a faculty-led team of UB students implementing a peer-support program for refugee high school students at one of the district high schools; a faculty member serving on the BPS Sexual Health Committee from 2012 to 2016.and

participated in the revision of the sex education curricula and passed a condom distribution policy. Because schools are central to community health and vitality, it is evident that many of the initiatives of the UBSSW will intersect and strengthen the efforts of UBTR. The longevity and effectiveness of these partnerships with BPS are a promising aspect of this project.

In addition, the UB's School of Engineering and Applied Sciences has established partnerships to support BPS students.

The UB Graduate School of Education (GSE) and BPS also have a strong relationship, working together in order to facilitate the educational opportunities and success of students and the development of teachers and leaders. GSE was instrumental in working to establish a FAFSA completion project, now in existence in all BPS high schools. This project enables students applying to college to receive support and counseling with respect to federal financial aid. GSE supports several federal and state pipeline projects including, Upward Bound, STEP (Science, Technology, Engineering Preparation), and Liberty Partnerships. GSE serves as the formal partner to BPS' BUILD Academy as it works to transform from a persistently struggling school into a thriving community school. GSE and BPS recently implemented a literacy mentor project to help improve the literacy skills of students for whom English is a new language. GSE

has also established an innovative Faculty In Residence (FIR) program, which provides opportunities for faculty - embedded in schools through structured release time - to share innovations and discoveries with BPS administrators, teachers, and students, and at the same time allows the faculty to observe how things work in applied settings, which generates the next set of research ideas. Finally, GSE and BPS have received support from a local foundation to lay the groundwork to establish a robust teacher residency program.

Profile of Partners

The Buffalo City School District is the second largest public school entity in New York State serving approximately 34,000 students in 58 schools and programs. The ethnic and racial background of students is 47% African American, 19% Latino, 9% Asian, 20% white and 4% multiracial. Approximately 21% of Buffalo's students experience special needs and receive supportive services through special education programs. Nearly 19% of the District's students speak over 80 different languages and receive some level of English Language Learner support. 76% of students in BPS are eligible for free and reduced-price lunch. Initially, UBTR will focus on five schools, concentrating TRs cohorts so that no fewer than 2 will be in a building at once. The schools we will be working with are Buffalo Elementary School of Technology PS 6 (grades P-8), BUILD Academy (grades P-8), Hamlin Park Claude & Ouida PS 74 (grades P-8), Math Science Tech Prep School (grades 5-12), and Burgard High School (9-12). Specific information regarding the needs of these schools is provided in the Needs Assessment and in Appendices C and D..

The University at Buffalo is a flagship institution in the SUNY system and a member of the Association of American Universities. UB is the largest and most comprehensive campus in the 64-campus State University of New York (SUNY) system. UB is a public, urban, doctoral-granting research institution located in Buffalo, New York that combines comprehensive undergraduate, graduate, and professional programs with one of the largest academic health

systems in the nation. More than 30,000 students study with more than 2,500 full time faculty members in 400 baccalaureate, masters, doctoral, and professional programs. With eleven schools and one college, UB offers programs in the humanities, arts, sciences, engineering, education, architecture, social work, business, and health-care professions.

The UB Graduate School of Education (GSE) is ranked #70 in the *U.S. News & World Report* rankings of top Schools of Education nationally. The School of Education is nationally accredited by the Teacher Education Accreditation Council (TEAC). Its faculty includes individuals recognized as national leaders who have attracted millions of dollars in funded research. Within GSE, the Teacher Education Institute (TEI) administers a comprehensive educator preparation program at the graduate level with certification in Early Childhood, Childhood, Bilingual Education, English as a Second Language, Sciences, Social Studies, English, Foreign Languages, and Mathematics. Students enter the programs as experts in their content area and are eager to apply effective pedagogical practices to guide the learning of PreK-12 students in our partner schools.

The UB College of Arts and Sciences (CAS) has a long history of working collaboratively with the Graduate School of Education (GSE) and local K-12 educators. This is most apparent in the work of Dr. Joe Gardella, Professor of Chemistry who has worked to reform science education, through a National Science Foundation Grant (*Interdisciplinary Science and Engineering Partnership),* by improving teachers' skills and knowledge. His notion of the STEM Ecosystem enables participants - students, teachers, and community advocates to engage in scientific inquiry that builds capacity across the board. His work has been particularly beneficial within the community schools model.

Innovative Practices Based on Knowledge from Research and Effective Practice

To ensure clinically-rich, meaningful pre-service preparation, residents will complete program coursework through modules that relate theory to practice through application of concepts during the residency year (

. This approach ensures that, through 15 months of guided apprenticeship, participants will complete requirements for certification, earn a master's degree through UB's state-approved program, and have experiences that integrate pedagogy, classroom practice, and mentoring through rigorous graduate level coursework. We envision our residency program to resemble many other existing urban teacher residency programs. One important innovation in our program will be the use of modules in place of traditional 3 credit hour coursework. Students in this program will complete 60 credit hours to earn an EdM that leads to certification as well as a masters degree. The expedited program would take place beginning in the summer and extend over the full academic year. TRs will take 15 hours of coursework (which will also include cohort/community building) during the summer, while participating in the 5-day TRSI where they will meet their mentor teacher. At the start of the school year, residents will be placed in residency, where they will co- teach alongside their MTs while taking coursework to earn licensure through the existing EdM program. At the conclusion of the residency, residents will complete an additional summer semester to meet the requirements for the EdM.

Selection and Development of Mentor Teachers and Specialist Coaches: Key to the success of the UBTR are the MTs who the residents will teach alongside for a full academic year. Therefore, identification and selection is critically important. Identifying those teachers who hold the greatest promise to serve as MTs is essential. According to the National Center for Teacher Residency (2017), an expert teacher is defined as someone who performs in the top 30% of

her/his school or district. In addition to demonstrating academic, subject competency, MTs must also exhibit the requisite dispositional skills that will lead to productive mentorship of the resident. Therefore, the identification process begins with a benchmark of academic performance. From there, selection will include recommendations, interviews, and other evidence, which could include a teaching demonstration. The precise process for selection will be negotiated with Buffalo Public Schools. In preliminary discussions with both BPS and the Buffalo Teachers Federation (BTF), all were in agreement that mutually determining the selection process would be critical. Fortunately, examples exist to guide the development of a selection process for MTs in the UBTR program. One such example can be found in the Montclair Urban Teacher Residency program. While initial identification of mentors occurs with school and district administration, the faculty and staff within the residency program observe the potential mentor teach and, in an interview, asks them to demonstrate how they would advise a resident by observing a video of someone teaching. This is just one of many existing examples from which the UBTR can draw to ensure that mentor teachers demonstrate expertise in planning and preparation, delivering appropriate instruction for diverse learning populations, collaborating in the improvement of practice, and analysis of formative and summative assessment data across multiple measures that are valid and reliable in determining the influence of teaching on student academic progress. What we know from existing programs, is that academic proficiency is necessary, but not sufficient. An ability to mentor adults (or a willingness to learn how to mentor adults) is necessary. In most cases, mentors are provided with a stipend ranging from $[redacted]. According to the National Center for Teacher Residency, in their 2014-15 survey of mentor teachers, 94% of mentors reported that mentoring residents made them more effective teachers.

In some cases, teachers may be identified as MTs because of their academic success but may need additional supports in other areas. We want to attract those teachers who have the greatest potential to be highly effective mentors. To that end, through our consortium, the university will be positioned to provide the additional support needed, either through the TRSI or through the UBTC, or other means to ensure that a mentor teacher has the tools needed for success. This might mean that a UB faculty member conducts multiple observations of the teacher in the classroom and provides guidance, advice, and mentorship. Generally speaking, all teachers will have access to a facilitated professional learning community (PLC). This will be facilitated by the program director and will provide a space in which teachers can seek support, assistance, and guidance from one another and from university faculty and staff.

While new MTs will be required to attend the TRSI, veteran MTs will be invited to attend in subsequent years. In fact, it is possible that veteran MTs teachers will be asked to serve in a leadership capacity in subsequent institutes. An additional innovation of UBTR involves the implementation of Specialist Coaches (SCs), who will meet regularly with residents during their first three years of teaching. Working through the UBTC, SCs will coordinate with novice teachers, BPS administrators, and university faculty to provide support that is ongoing, context-specific, research-based, and driven by student learning needs. By focusing on improving early career teacher effectiveness and self-efficacy and fostering a culture of collaborative professionalism, SCs will improve student performance and increase teacher retention (Darling-Hammond, Hyler, & Gardner, (2017). Moreover, the culture of collaborative professionalism fostered by the UBTC will invite participation by MTs, SCs, and teachers throughout BPS, supporting skills that will enhance student achievement across the curriculum with particular focus on the areas of literacy, STEM, and computer science.

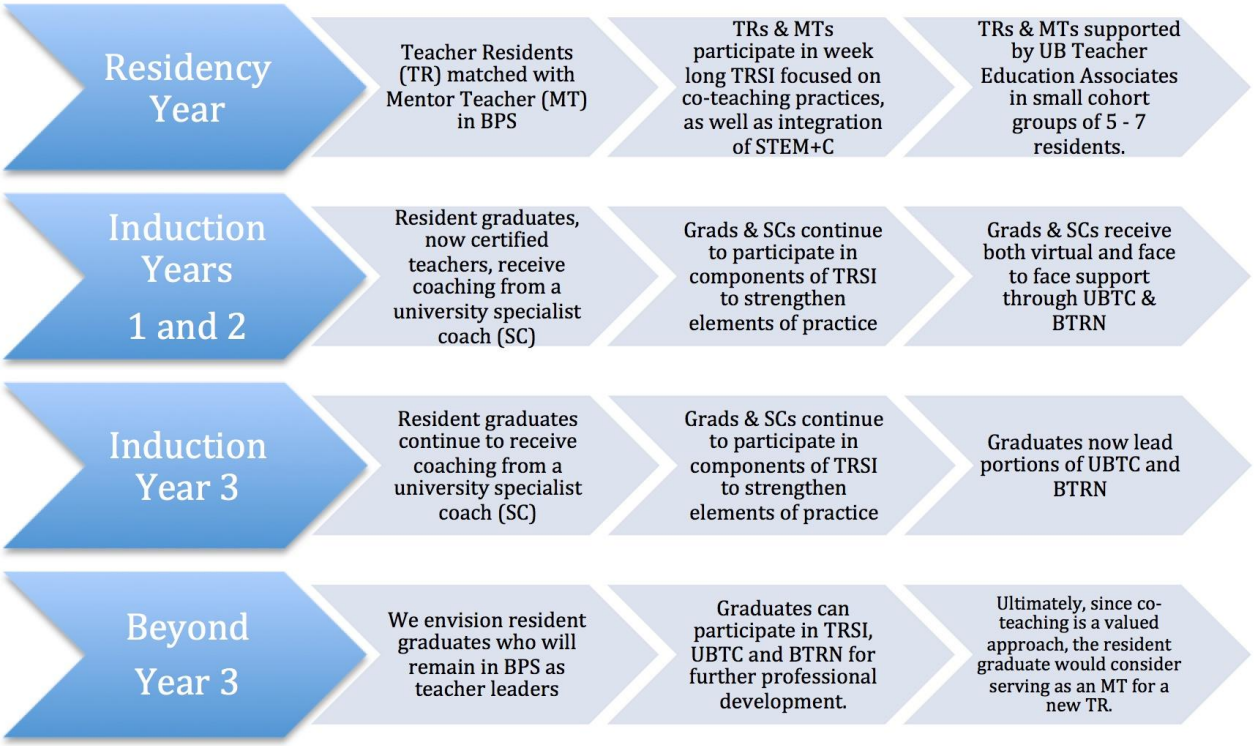
Further strengthening the experience of residents in developing expertise in instructional effectiveness in high-needs contexts, MTs and SCs will participate in professional development designed by the St. Cloud Academy for Co-Teaching and Collaboration. In addition, MTs, as well as school leaders in schools where residents are placed, will be involved in the UBTC, which will facilitate a collaborative approach to continuous improvement in teaching effectiveness and contribute to the alignment of program coursework with clinical practice. The UBTC will provide access to resources to support the development of a virtual and in-person learning community that will include residents, MTs, SCs, administrators, and university faculty. Through systemic professional development and targeted, school-based inquiry that aligns with the creation of a culture of Collaborative Professionalism, the UBTC will provide targeted, tailored professional development to partnership participants as they seek to continually improve their capacity to advance student learning(Guha, R., Hyler, M.E., & Darling-Hammond, L., 2016; National Center for Teacher Residencies, 2017) . To support collaborative professionalism through the consortium, UBTR will provide residents with 3 years of post-graduate coaching by Specialist Coaches, followed by 2 years of participation in the consortium. To cultivate a culture of shared purpose and collaborative growth, all mentor teachers and administrators in host schools will be also be able to participate in the consortium.

MTs will be relieved from some aspects of their teaching duties to compensate for the additional responsibilities related to the residency, thus increasing their ability to serve as pedagogical and content area experts, teacher leaders throughout the induction process, and liaisons with school personnel, families and communities. SCs will be pedagogical experts, and may include BPS classroom teachers on special assignment, doctoral students in GSE, Teacher Education Associates (TEAs) from the UB Teacher Education Institute (TEI), and GSE Faculty

in Residence (FIR). Selection of both MTs and SCs will require clear criteria, developed in collaboration with all stakeholders, with respect to pedagogical effectiveness and subject area knowledge.

Supporting the development of MTs, SCs, and residents not only enhances the skills of exemplary teachers, but these positions also provide meaningful leadership roles that will lead to increased retention of BPS's most outstanding teachers. In addition, the thoughtful, deliberate development of leadership skills in UBTR graduates through the UBTC will ensure a strong pipeline of BPS teacher leaders for years to come. Therefore, not only will the UBTR program make a significant contribution to the knowledge base of how to prepare effective, successful teachers for urban schools that will serve as a prototype for other university-level teacher preparation programs seeking to develop context-based residency models, but it will also contribute to the knowledge base on how to develop and support teacher leaders for urban settings. Moreover, the UBTC will provide a model of how schools can move toward a culture of collaborative professionalism that supports student learning.

Model for Building Collaborative Professionalism through UBTR



Selection, Induction, and Retention of Residents: As indicated earlier, a hallmark of urban teacher residency programs is their commitment and success in recruiting people of color. This is critically important to the UBTR, as research indicates that it impacts student achievement (.. Recruitment will be the responsibility of university faculty and staff. It will be directed by the UBTR program director and supported by the Dean of the Graduate School of Education. As such, a comprehensive recruitment plan will be developed in the early part of year one to ensure this diversity. The UBTR will recruit through multiple efforts. These include recruiting students of color directly from undergraduate programs at UB. We will do this by establishing information sessions on campus to talk about the UBTR. Additionally, we will reach out to the undergraduate academic advising network to connect us directly with students of color. A multi-pronged approach also will include working through the office of the Chief Diversity Officer (CDO) to

help prioritize recruitment. The Dean will use her position to communicate information about UBTR to university leadership. Working with the CDO will communicate the centrality of the program to the university community at large. Finally, we will engage with student organizations on campus to help inform students. These organizations include academic honor societies as well as social-cultural organizations that are part of the UB Student Association. Further, utilizing the Graduate School of Education Office of Marketing and Communications, we will conduct an electronic and print information campaign that will increase knowledge and awareness of the opportunity.

In addition to on-campus outreach, we will develop a robust community-centered outreach plan. We will engage with neighborhood community centers and organizations as well as neighborhood faith-based organizations. Engaging with community leaders will enable us to build a network of recruiters. We believe this strategy will lead us to success in terms of identifying a larger pool of interested candidates who are racially, ethnically, and/or linguistically diverse. Our goal, much like existing urban teacher residency programs, is to have one-half to two-thirds of students within the program identify as underrepresented minorities. This goal is aligned with the hiring objectives of BPS and reflects the communities they serve. Recruitment goals will further support the instructional initiatives and curriculum of BPS by collaborating to ensure that residents earn licensure in areas that correspond to the hiring needs of district schools.

Selection criteria for residents will be finalized in cooperation with BPS, and will include strong content knowledge, strong verbal and written communication skills, and commitment to urban youth and public education. The selection process will involve a multidimensional application process, collaboratively developed with BPS and community partners. Knowledge,

skills, and dispositions will be assessed through multiple measures, including but not limited to a written application, interviews, demonstration lessons, on-demand writing, and participation in scenarios simulating critical incidents that candidates might experience during their residencies or early teaching careers. Candidate performance will be rated systematically by groups representing all stakeholders.

To facilitate induction and improve retention, residents will be grouped into cohorts for both coursework and in school placements. Induction activities will involve week-long Teacher TRSI for residents, expert teachers, and principals of schools in which the residency will take place. The TRSI will be required for all new residency participants (residents, mentor teachers, and principals) and will be available at no cost to returning residents, expert teachers, and principals who wish for continued professional development. Each TRSI will include a two-day intensive seminar on co-teaching. We will adopt the St. Cloud model for co-teaching and collaboration. The St. Cloud Academy for Co-Teaching & Collaboration has long been recognized for its train the trainer model for co-teaching. We will contract with St. Cloud State during the planning year to have them conduct train the trainer training. In all subsequent years, Graduate School of Education trainers will conduct the co-teaching portion of the TRSI. In addition to this two-day co-teaching workshop, the TRSI will include opportunities for residents, expert teachers, and building principals to engage in workshops and discussions on topics ranging from assessment, interventions, curricular innovation, and diversity and equity. A hallmark of the institute will be an annual keynote address by a leading research, policymaker, or practitioner of teacher residency.

In addition to the innovative, teacher preparation curriculum integrated through a modular approach for exceptional connection to practice, another critical component of the

UBTR Program will be the careful selection of schools and teachers for the residency. To ensure that residents are placed in high functioning environments, schools will have to apply to "host" cohorts of teacher residents. Host schools will participate in development activities designed to support a culture of Collaborative Professionalism (Hargreaves & O'Connor, 2018).

Professional Development Quality, Intensity, Duration, and Improvement on Practice

Taking a multi-layered approach to support, the program will provide Teacher Education Associates (TEAs) and Specialist (RCs) to work with MTs and residents. Within the host schools, TEAs will mentor the teacher residents during their year-long residency and will work with GSE faculty to deliver a portion of the teacher preparation curriculum. TEAs will be selected through a careful screening process that will include: (1) recommendations; (2) evidence of student learning gains and collaboration with colleagues to improve instruction; (3) strong content knowledge and pedagogical skills; including the ability to differentiate instruction to meet the needs of students with different learning styles; (4) use of formative and diagnostic assessments to improve student learning; (5) classroom observations; and (6) post-observation debriefing interviews.

Specialist Coaches (SCs) will work with residents during their first three years of teaching. In collaboration with district-provided early career mentors, SCs will spend one day per month with residents to strengthen the clinical connections necessary to support a strong professional network. Coordinating efforts through the UBTR Consortium, SCs will address the needs of residents through a customized approach to professional development that is aligned with the tenets of collaborative professionalism.

MTs, TEAs, and SCs will participate in the Teacher Residency Summer Institute collaborative teacher training and in monthly professional development meetings. These

meetings will be designed to: (1) continue to strengthen the mentoring/coaching skills learned during the formal St. Cloud Academy training and will include an additional component that focuses on literacy instruction across the content areas; (2) reinforce the use of formative assessment tools and mentor protocols through the ongoing examination of these artifacts of mentor/coaching practice; (3) provide a supportive environment where MTs, TEAs and SCs can discuss the challenges they face in working with residents; and (4) identify additional training needs.

In addition to the support provided during by MTs and TEAs during the residency year, SCs will continue to mentor graduates during the first three years of teaching, meeting regularly with program alumni, participating in systemic professional development, and facilitating professional learning communities focused on teacher effectiveness as related to student performance. TEAs and SCs will be essential participants in the planning and implementation of the TRSI and the UBTC, and they will help to ensure that the program reflects ideal practices in clinically-rich teacher education.

SECTION TWO: QUALITY OF PROJECT DESIGN

Proposed Project Rationale

The overarching objective of the UBTR program is, in partnership with Buffalo Public Schools, to develop and retain a district-serving pipeline of highly effective, diverse teaching professionals capable of increasing student achievement. Through piloting this approach with four cohorts in Buffalo high-need schools, the UBTR program will contribute to the knowledge base on how to prepare and retain effective, successful teachers for urban schools in mid- size cities and will serve as a prototype for other university-district partnership programs in New York and elsewhere.

Program Description

Building on the medical residency model, the UBTR provides a cohort model for students experience a clinically intensive pathway to certification. TRs, MTs, SCs, and building principals are carefully selected and supported throughout the process of admission, induction, and classroom teaching. Working alongside an expert MT, residents serve as co-teacher for a full academic year in a relationship that is facilitated and supported by university-affiliated TEAs. TRs, MTs, SCs, and TEAs, as well as administrators in participating schools, are provided professional development through the Teacher Residency Summer Institute, as well as the UBTI Consortium before and during the residency year, as well as for at least 3-years after completing the program. The UBTC, essentially a network of program participants and alumni, will be guided by principles aligned with a creation of a culture of Collaborative Professionalism. Supporting recruitment of a diverse cohort by minimizing established barriers for historically marginalized students, TRs will receive a [redacted] stipend during their participation in the program. To enhance retention, SCs will mentor with graduates during their first three years of teaching, and graduates will participate in the UBTC and TRSI during their first five years of teaching. In addition, MTs, SCs, TEAs, and school leaders will participate in UBTC activities, strengthening the cultivation of a culture of collaborative professionalism proven to boost studer achievement. Ultimately, UBTR will contribute to the creation of a sustainable pipeline of learner-ready teachers who are committed to teach in BPS schools and whose demographic characteristics more closely reflect the communities in which they teach.

Statement of Problem. According to New York State United Teachers, the state is currently experiencing teacher shortages, especially in math, science, English for speakers of other languages (ESOL), and special education. Magnifying the teacher shortage problem is a

concern over teacher retention, which in many cases has reached crisis levels. Problems arising from this crisis are many, not the least of which is the cost to districts to replace teachers. On average, the cost to replace a teacher is estimated at [redacted]. Nationally, this creates a $2.2 billion problem. Further, and of even greater concern, is the academic crisis that emerges when districts cannot retain teachers. With constant turnover, schools cannot gain traction on new academic initiatives, thus preventing them from implementing innovations in teaching. While retention and staffing challenges are ubiquitous, they are greatest in urban and rural schools. The student and community populations within urban and rural school districts have been historically underserved. Therefore, it is these students who are arguably most in need of well-prepared teachers who remain in the field more than five years. It has been well documented that as the student population within the U.S. (New York being no exception) grows increasingly diverse – racially, ethnically, and linguistically, our teaching force continues to be descriptively homogeneous. Of the 32,000 students in the Buffalo Public Schools, 80% identify as a member of at least one underrepresented minority group, while just 10% of teachers identify as underrepresented minorities. The enrollment of underrepresented students in our teacher preparation programs matches this disproportion, with an average of 15 - 18% students reporting minority group status each cohort year. Decades of research suggest the positive impact, in terms of self-efficacy and learning outcomes, on students who are taught by someone with whom they can identify (for example, in terms of race or ethnicity). Therefore, a misalignment exists between our student bodies and our teaching profession.

To add an additional layer of context, interest in traditional teacher preparation programs has declined fairly significantly in the last 5-10 years. Enrollment in teacher preparation programs across our state has decreased by 40 percent since 2010, a decline of almost 30,000

potential teachers between 2009-10 and 2012-13 (TeachNY, 2016). At UB, we have experienced a similar drop in enrollment, with 50% fewer students now than in 2009-2010. In many cases, educator preparation programs (EPPs) are being replaced by alternative certification programs. Results of studies examining student learning as well as retention of teachers prepared alternatively is unbalanced, at best. Teachers prepared traditionally tend to outperform alternatively certified teachers. Teachers prepared traditionally tend to stay in the field longer (albeit not long enough). To address this problem, UB GSE has established combined programs with CAS in which students can obtain a BA in a content area and an EdM within 5-year time frame. The program will culminate in a yearlong teacher residency and will be heavily weighted toward urban school teacher preparation. While these innovative programs begin to respond to the need for highly qualified teachers, we believe more is needed.

Accordingly, to effectively recruit, prepare, and retain successful, and diverse teachers for BPS high-need urban schools, the UBTR proposal will design and establish an innovative approach to teacher preparation that addresses the weaknesses and incorporates the strengths of both traditional and alternative approaches to teacher education and licensure. The UBTR proposal borrows from highly successful existing residency programs but, uniquely, proposes an novel collaborative and systemic extended learning opportunity for residents and teachers that we believe will not only affect recruitment and student academic achievement, but also affect retention.

Research suggests that teachers prepared alternatively tend to leave the field before they've completed 5 years of teaching. In the case of teachers in high poverty schools, research indicates that attrition hovers over 50%. In contrast, teachers prepared through

residency tend to stay in the field at rates of 80-90%. This figure is even more significant because teachers prepared through residency tend to teach in high poverty schools.

While keeping teachers in the field is important and itself a worthwhile goal, ensuring that they are learner-ready on day one is also necessary. Once again, emerging evidence suggests that students prepared through a one-year teacher residency, by year three, outperform students prepared traditionally. According to the Learning Policy Institute, initial studies of existing residency programs show a positive correlation between student achievement and the manner in which students' teachers are prepared:

- When comparing student achievement between novice teachers prepared through the Urban Teacher Residency Program at Hunter College with other novice teachers, students of UTR program outperformed others on 73% of comparisons on the Board of Regents exam scores. They out performed peers by the greatest amount on Living Environment, English, Integrated Algebra, and Chemistry.
- In the Boston Teacher Residency Program, using a value-added analysis, students of BTR teachers, by their 4 th year, outperformed their peers by 7% of a standard deviation.
- Memphis Teacher Residency program – students of MTR teachers had higher student achievement gains than other novice teachers and in almost all cases,higher gains than veteran teachers on the Tennessee Comprehensive Assessment Program exam.

According to national studies of teacher residencies, 45% of U.S. teacher residents are people of color. Compared to the national average of teachers overall who are people of color (19%), this is impressive. More than two-thirds of the students enrolled in the San Francisco teacher residency are people of color. In other residency programs in Boston, Chicago, and Denver the numbers range from one-third to one-half of residents who are people of color.

Needs Assessment: Because BPS is an open enrollment district, and census data will provide information related to neighborhood and not schools, census data for BPS do not provide information that would be school specific. Therefore, we are documenting high-needs schools in BPS through the NYSED School Report Card data. 90% of Buffalo's students experience some level of extraordinary need such as poverty, attendance barriers, social adjustment challenges, homelessness, trauma, and mental illness. At the same time, Buffalo students are recognized in the community and regionally for their remarkable resilience in the face of such challenges. As more and more students graduate on time and select post-secondary options for college and career, it is apparent that Buffalo students are thriving and overcoming profound barriers to success. The recognized contributions from the National *Say Yes to Education Scholarship*, where Buffalo students are guaranteed a last tuition dollar scholarship for college, is a key strategic benefit for the nearly 2000 students who graduate each year. Say Yes is an essential asset for students by providing much more than a scholarship, including mentoring support, mental health clinics in each school, legal clinics for parents, and mobile primary health care.

Specific potential partner schools identified for this collaboration possess strong, capable leaders eager to establish innovative opportunities to participate in teacher development. They also possess the knowledge, skills, and professional commitment necessary to develop and sustain a high quality partnership with the University at Buffalo where it is most essential—inside the schoolhouse. Identified partner schools include Buffalo Elementary School of Technology PS 6 (grades P-8), BUILD Academy (grades P-8), Hamlin Park Claude & Ouida PS 74 (grades P-8), Math Science Tech Prep School (grades 5-12), and Burgard High School (9-12). All meet the criteria for high needs in terms of poverty and teacher need (demonstrated by teachers teaching out of their areas of licensure, indicating a lack of training in the subject areas in which they are designated to

teach. **Buffalo Elementary School of Technology PS 6** meets the criteria for a high-needs school in that 88% of its 509 students qualify for free or reduced lunch, 91% are identified as economically disadvantaged, and 42% are English language learners. Student performance on NYSED examinations also reveal great need, since 12% of all students tested proficient in ELA and 10% of all students tested proficient in math. In addition, 14% of teachers are teaching content outside of their certification area. **BUILD Academy** is currently in receivership, a NYSED designation forpersistently struggling and struggling schools. Of its 415 students, 90% qualify for free and reduced lunch and 91% are identified as economically disadvantaged. Student performance reflects high need, as well, sinc just 1% of all students tested proficient in the NYSED assessments in ELA and 2% of all students tested proficient on NYSED math assessments; moreover, 6% of teachers are teaching out of their areas of certification. In addition, the attendance rate is 88% and the suspension rate is 36%. **Hamlin Park PS 74** is also in receivership, a NYSED designation forpersistently struggling and struggling schools. Of its 407 students, 93% qualify for free and reduced lunch and 94% are identified as economically disadvantaged. English language learners represent 27% of the student population, and 22% of students are identified as having a disability. The overall attendance rate is 89%. Student performance reflects high need, as well, since on NYSED examinations just 11% of all students tested proficient in ELA and 2% of all students tested proficient in math. Teacher need is evident too, as 10% of teachers are teaching out of their areas of certification. In the**Math Science Tech Prep School,**78% of its 711 students qualify for free and reduced lunch, 84% identify as economically disadvantaged, and 25% are identifie as students with disability. The school reports that 40% of its student population are English language learners, and an overall graduation rate of 53%. Contributing to student achievement challenge, the school attendance rate is 79% and the suspension rate is 57%. Teacher need is demonstrated by the fact that 11% of teachers are teaching outside of their areas of licensure.

Burgard High School is the potential partner BPS school for the UBTR program. Of its 457 students, 75% qualify for free and reduced lunch, 84% are identified as economically disadvantaged, and 25% are identified as students with disabilities. In terms of instruction, 21% of teachers teach out of their certification area, and 17% of courses are taught by teachers who are working outside of their certification area. The overall attendance rate is 79% and the suspension rate is 50%, both of which contribute to the school's graduation rate of 57% and dropout rate of 12%.

Overall, each of these potential schools have higher than average poverty rates, are schools requiring academic intervention in order to attain Good Standing status with the New York State Education Department, and are continuously seeking to attract and retain irreplaceable star teachers for every one of their classrooms.

The core goals on school improvement plans include improved accountability status toward Good Standing within three (3) years, improved attendance rates for students, reduced disciplinary exclusion rates for students, and expanded access and opportunity to integrate high quality supportive services inside each school. In addition, UBTR will facilitate the ability of BPS schools to meet the characteristics of highly effective schools identified by the New York State Education Department (NYSED) through EngageNY. The seven characteristics include 1.Visionary Leaders, 2. Curricula, 3. Instructional Practices, 4. Social and Emotional Development, 5. Partnerships, 6. Pathways, 7. Cultural Competence, and 8. Cultural Responsiveness. Specifically, UBTR will contribute to the development of visionary leaders through the participation of administrators in UBTC activities. MTs, TRs, and SCs, through participation in the UBTC and TRSI, will have opportunities to develop aligned, engaging, rigorous curricula as well as instructional practices that support effective implementation.

Developing a culture of collaborative professionalism through initiatives organized by the UBTC and TRSI will enhance morale within the school community, improving the sense of belonging that is essential for supporting the social and emotional development of learners, and the partnerships fostered through UBTR will enhance connections among school personnel and community members. Finally, increasing the racial and ethnic diversity of teachers through UBTR, coupled with professional development offered through UBTR and TRSI, will strengthen educators' cultural competence and their ability to develop and deliver culturally responsive instructional experiences (

Goals, Objectives, and Outcomes

The overarching objective of the University at Buffalo Teacher Residency (UBTR) program is, in partnership with Buffalo Public Schools, to develop and retain a district-serving pipeline of highly effective, diverse teaching professionals capable of increasing student achievement. To ensure that we meet this goal, the partnership has established the following objectives that build on and greatly expand work that is already underway: (1) Desig and establish an innovative teacher preparation program for BPS high-need schools; (2) Recruit and prepare 50 highly effective teachers for BPS schools, with attention to the recruitment of candidates from diverse backgrounds; (3) Provide ongoing support for program participants, bo residents and teacher leaders, through an innovative collaborative consortium for at least five years after completion of the residency; (4) Develop and support a district-serving STEM professional development program, with specific attention to Computer Science; and (5) Strengthen the role of BPS secondary school administrators in supporting novice teachers and teacher leaders.

Objective 1: Design and establish an innovative teacher preparation program for BPS high-need schools.

The UBTR proposal will target outstanding individuals who already have a bachelor's degree (Teaching Residents) and will prepare them through an innovative teacher preparation program that culminates in a Master's of Education degree. Although students must enter the program with a 3.0 GPA or higher, our cohort GPA consistently averages about 3.3. All teacher education students' dispositions are, and will continue to be screened through an interview process and monitored throughout the program. The students are intellectually curious, able to critically-reflect, and to implement evidence-based practice in diverse settings. This is demonstrated through completion of a reflective inquiry project, where teacher candidates critically examine empirical research, collect and analyze data, and implement learned results to modify and improve classroom instruction.

The 15-month teacher preparation curriculum will integrate the research and theory behind effective teaching with a year-long residency under the mentorship of an exemplary classroom teacher **before** Teaching Residents (TRs) become the independent teacher of record. A curriculum design team comprised of University at Buffalo Graduate school of Education faculty, Assistant Dean for Teacher Education, TEAs, CAS faculty, Computer Science Faculty, BPS inst, BPS mentor teachers, and the UBTR Director will refine the curriculum in Year 1 of the grant. The first cohort of 10 TRs will begin coursework in the newly designed UBTR Program in Summer 2019, followed by a year-long residency during the 2019-2020 school year. In Years 3, 4, and 5 additional cohorts will enter the UBTR Program.

The UBTR curriculum will not be based solely on a traditional 3-credit hour course structure. Rather, the curriculum design team will work toward an innovative module approach to course delivery. The curricular scope of the modules will mostly mirror our existing curriculum, maintaining the existing quality of the curriculum described below. The manner in which the curriculum is delivered, however, will be changed to a module approach. In addition to our traditional curriculum we will integrate modules to support TR learning in STEM+C to support objective 4. The module approach holds great promise because it will provide the students with targeted practice of skills and tasks in an immersed setting, as opposed to learning theory in an abstract setting and applying skills subsequent to instruction (Janssen, Grossman, & Westbroek, 2015).

Instead of delivering our coursework through a traditional delivery system, students will begin with modules during the summer and complete them throughout the academic year. These modules are designed to meet every learning outcome on existing syllabi but the delivery will occur "just in time" throughout the semester. Modules introduced in the first summer of study will be focused primarily on theoretical knowledge and skills, shift to developing practical knowledge and skills in the fall semester, and progress to growing proficiency in implementation during the spring semester. For example, a student might complete several foundational modules on assessment during the summer or at the beginning of the academic year, but they may wait to complete their module on reading student test scores and regrouping students based on test scores until the time of year when student test data is provided to teachers.

Undergirding the module-based approach is that high-leverage teaching practices are embedded in the context of residency where students observe and then enact effective practice. This approach ensures that the outcomes of our existing curriculum is met, but the expectation is

that our students are exceeding them given they will address them on a repeated basis throughout the residency. Scaffolding the modules so that each is timely, relevant, and engaging will allow us to maintain a high threshold of quality, and also provide students with relevant experiences in which to understand and apply this knowledge. Modules will strategically be offered online and/or embedded within the schools to best meet the needs of our preservice teachers. GSE has been a leader in providing high quality online academic programs for many years, consistently ranking within the top 15 online education programs nationally. Thus, the UB curriculum team is well-positioned to take our courses and redesign them in the form of combination of in-person summer modules, online modules, and in the residency experiences. Combined, these informative, reflective, and interactive experiences should promote high degrees of teacher efficacy in our TRs (Siwatu, 2007). In essence, this is the heart of the UBTR model.

Throughout the UBTR curriculum, issues of teaching diverse and high needs students (Knapp, Addelman, Marder, McCollum, Needles, Padilla, Shields, & Zucker, 1995) will be addressed, including culturally relevant and responsive teaching (Gay, 2000; Ladsen-Billings, 1994; Irvine, 1990) and issues of diversity in classroom management (Brown, 2003; Powell, McLaughlin, Savage & Zehm, 2001). Additionally, the following competencies are important for all teachers, but imperative for teachers in high needs schools. This list is a compilation of New York State licensure requirements, the UB Student Teacher Assessment Record Clinical Evaluation instrument, and qualities of Haberman's (2005) effective teachers of children in poverty.

1. Creating and maintaining positive and safe learning environments includes developing trusting relationship with students and families, organization and appropriate assertiveness,

modeling caring and respectful interactions, promoting social development and group responsibility;

2. Planning instruction includes knowledge of subject matter content, student development, a variety of robust instructional strategies, making learning accessible to all students, the alignment of goals and objectives with state and national content standards and student development, preparing instructional options to provide flexibility;
3. Engaging and supporting students in learning includes incorporating connections to students' prior knowledge, background, experiences and interests, facilitating learning that incorporates self-direction, interaction, choice, consideration of multiple perspectives, employs critical thinking, problem solving, and meaningful objectives;
4. Assessing student learning includes creating and communicating criteria for assessing students' work, utilizing data from multiple sources to assess student learning and improve instruction; and
5. Developing as a professional includes having high expectations for all students, commitment to professional standards and ethics, commitment to supporting learning that encourages the academic, social, and personal growth of all students, collaboration with families and all other relevant parties, recognition of the importance of the social context of schooling, exhibition of sound judgment, acceptance of constructive criticism, and commitment to reflection on practice.

In addition to the competencies listed above, the UB GSE remains committed to excellent teacher preparation through intensive, immersive clinical experiences. We have an established history of developing strong working relationships with partner schools in our existing liaison model. Currently, students and university clinical faculty are immersed in liaison schools for

fieldwork focused on developing basic teaching competencies (115 hours) as well as traditional student teaching (> 80 full days) . We anticipate that the ability to facilitate mutually beneficial relationships in our existing model will be an asset as we shift our clinical experience model to teacher residency, which will include even more hours/days spanning the entire school year from start to finish.

The UB GSE teacher education curriculum is aligned with state requirements, state professional standards, as well as the Interstate Teacher Assessment and Support Consortium (InTASC) Model Core Teaching Standards. Woven throughout the curriculum are themes of access and equity to quality education for all students. Further, our programs have a strong focus on preparing preservice teachers to understand and use research and data to modify and improve classroom instruction with a particular focus on meeting the needs of students with disabilities and English language learners (ELLs).

The promotion, participation, and progress of students with disabilities in the general education curriculum, as well as preparation with knowledge and skills to work collaboratively with colleagues are specifically addressed in a stand alone course (LAI 574), common to all teacher education students. Specifically, coursework incorporates effective practices for planning and designing co-teaching and collaboration with peers, categories of disabilities, identification and remediation of disabilities in conjunction with individualized education program teams, individualizing instruction, and applying positive behavioral supports and interventions to address student and classroom management needs. Students are required to make adaptations and adjustments based on universal design elements within lesson and unit plans to support diverse learners.

Further, in instructional strategies coursework (LAI 694/698), students examine features of cultural and linguistic diversity in classrooms and implement strategies for creating the culturally inclusive classroom that values diversity and supports student success. Each program area includes information and research-based instruction on ELLs and their needs regarding academic vocabulary, writing instruction, and oral work in the classroom. This information is extended through targeted observations during field experience and in the seminar attached to the student teaching. Students also are required to research and analyze two web sites which address the needs of ELLs and/or special needs students. Throughout their clinical experiences, all students are asked to assess the learning of classes and, in confidential case studies, the learning of specific students. They are required to both indicate the degree of content mastery and to provide alternatives and ideas to improve that mastery. Additionally, students are encouraged to develop their own assessment instruments as diagnostic tools and to create additional or different activities to enhance learning. Through lesson analysis and data examination students learn to reflect on learning outcomes and to modify instruction and activities. Literacy instruction is also provided in each content area methods class as a foundational skill; in addition, every student is required to take LAI 514, Language, Cognition, and Writing Across the Curriculum, which gives additional and targeted strategies regarding comprehension, decoding skills, and writing instruction.

As part of state licensure, our students take the Educating All Students (EAS) Exam which assesses student competency of diverse student populations, English Language Learners, students with disabilities and other learning needs, teacher responsibilities, and school-home relationships. For the 2016 - 17 cohort year, UB had a 100% passing rate on the EAS exam. In 2015-16, 96% students passed and in 2014-15, 100% passed. Additionally, students take

Content Specialty exams (100% pass rate) and the edTPA (83% pass rate). The UBTR curriculum will build on this strong foundation to ensure that TRs are well prepared to meet the needs of all learners through research-based strategies and data analysis, as well as meeting the requirements for licensure exams.

The chart below summarizes the UBTR program components that will focus on the needs of BPS, an analysis of teaching and learning in the urban context, the New York State Standards of Learning, and the skills and dispositions needed to succeed in high-needs schools.

UBTR Program Components	
Length of Residency plus Masters Degree	15 months
Program Competencies	The UBTR teacher preparation curriculum will not be based on a traditional 3-credit hour course structure, but rather delivered through theory to practice modules. Program completers will still demonstrate competencies in the following areas: • content-specific pedagogy • New York Standards of Learning and BPS curriculum • culturally relevant and responsive teaching • motivation techniques • differentiated instruction • classroom management models • literacy/reading across the content area • needs of ELLs and students with disabilities • use of research and data to modify and improve instruction • caring relationships with students
Assessment Tool for Residents	UB Student Teaching Assessment Record (STAR) for residents; NYSUT's Teacher Practice Rubric aligned to New York State Teaching Standards for subsequent years of induction support
Program Components	**Year 1: June-August:** Introductory theoretical modules including developmental characteristics of students, instructional strategies, classroom management, and lesson planning; work in BPS summer school classes or take content courses, depending on the need. Intensive week-long TRSI. **September-June:** Five days a week in host school with MT; continue EdM program and progression through targeted modules; develop teaching portfolio, consisting of performance-based assessments aligned with program and New York Standards of

	Learning, participate in monthly, ongoing professional development sessions in STEM+C. **July - August (2nd summer):** Residents complete EdM. **Years 2- 3:** Graduates have a full-time, paid teaching position with induction support from a UBTR specialist coach, the UBTC, and BTRN (described in Objective 3) **Year 4:** Graduates continue their job with same induction supports, graduates take on leadership roles within the UBTC and BTRN.
Resident Weekly Schedule	Five days a week with an MT; graduate classes held one afternoon per week; online study and implementation of modular coursework.
New York Certification Requirements	B.A. degree; pass edTPA, Content Specialty Exam (CST), and Educating All Students Exam (EAS); complete approved program; fingerprinting; completion of child abuse training, school violence prevention training, and DASA training.
Degree Earned	Master's of Education (after 15 months)
Incentives for Residents	$18,000 living stipend
Service Commitment	At least 3 years in an BPS high-need secondary school

Objective 2: Recruit and prepare 50 highly effective teachers for BPS secondary schools.

A hallmark of urban teacher residency programs is their commitment and success in recruiting people of color. This is critically important to the UBTR. Recruitment will be the responsibility of university faculty and staff, with support from the UBTR district liaison. It will be directed by the UBTR program director and supported by the Dean of the Graduate School of Education. As such, a comprehensive recruitment plan will be developed in the early part of year one to ensure this diversity. The UBTR will recruit through multiple efforts. These include recruiting students of color directly from undergraduate programs at UB. We will do this by establishing information sessions on campus to talk about the UBTR. Additionally, we will reach out to the undergraduate academic advising network to connect us directly with students of color. A multi-pronged approach will also include working through the office of the Chief Diversity Officer (CDO) to help prioritize recruitment. The Dean will use her position to communicate information about UBTR to university leadership. Working with the CDO will communicate the centrality of the program to the university community at large. Finally, we will engage with

student organizations on campus to help inform students. These organizations include academic honor societies as well as social-cultural organizations that are part of the UB Student Association. Further, utilizing the Graduate School of Education Office of Marketing and Communications, we will conduct an electronic and print information campaign that will increase knowledge and awareness of the opportunity.

In addition to on-campus outreach, we will develop a robust community centered outreach. We will engage with neighborhood community centers and organizations as well as neighborhood faith-based organizations. Engaging with community leaders will enable us to build a network of recruiters. We believe this strategy will lead us to success in terms of identifying a larger pool of interested candidates who are racially, ethnically, and/or linguistically diverse. Our goal, much like existing urban teacher residency programs, is to have one-half to two-thirds of students within the program identify as underrepresented minorities. The UB Teacher Education Institute (TEI), UB GSE's teacher preparation office, currently employs a rigorous vetting system to select teacher candidates. This includes an examination of transcripts as well as an interview that seeks to get a sense of students' interests and dispositions toward teaching and learning and equity. We will use TEI as an integral part of our vetting process.

According to the Learning Policy Institute, salary and compensation is one of the leading reasons teachers leave the profession. The generally low pay for teaching serves as a disincentive for many to go into the profession. If one adds to that the prospect of tuition related debt, the disincentive is further enhanced. Low prospects for professional compensation make the trade-off to incur debt during education a large enough disincentive to recruit and attract future teachers. Further, given the intensive nature of the residency program, it would be very

difficult for residents to work during their year in residency. As such, compensating the residents with an annual stipend will be critical to our efforts to recruit a diverse pool of residents. Please see attachment for further detail. According to the Bureau of Labor Statistics, teacher aides in the city of Buffalo earn on average [redacted]. Our stipend is comparable to that of a teacher aide.

In exchange, UBTR graduates will be expected to serve for at least three years in an BPS high-need school. At the beginning of, and upon completion of, each year of service, graduates will need to submit documentation from the BPS Office of HR certifying that they are teaching in an eligible school. Those who do not complete the three-year service commitment will be required to repay the living stipend with interest. Specific details on repayment rates and conditions will be worked out by the partnership during Year 1 of the grant. All repayment dollars will be used to carry out additional UBTR activities.

Four cohorts of TRs will be selected each year to begin the 15-month UBTR preparation program, starting in 2010-2011. In addition to an overall cohort approach, TRs will be placed in host schools in cohort groups of 5-7 TRs so that participants can work together and receive additional support on a daily basis.

A deliberate decision was made to keep the cohort groups small. To ensure sustainability, UBTR partners want to ensure that we build the capacity to offer a high-quality residency program before attempting to scale up. Further, lessons learned from a five-year review of the Boston Teacher Residency Program point to the importance of working with fewer host schools (Berry, Montgomery & Snyder, 2009). In order to impact individual school buildings, we have designed the UBTR program to be highly impactful in fewer schools. Therefore, we imagine approximately 4-8 residents per school building. In so doing, we build a

community of advocates, champions, and exemplars of effective teaching. As reported above, in a 2014-15

survey by NCTR, 94% of teachers serving as expert teachers stated that they felt that mentoring made them more effective. Effectively, we can impact school-wide change with just one cohort of 4-8 students in one school building. In the budget that accompanies this narrative, we budget for 10 residents during year two, 10 in year three, and 15 in years four and five. Smaller cohorts will also enable GSE to carefully study the impact of the residency model by comparing graduates of GSE's traditional preparation programs (which will continue during the project implementation years) and graduates of the UBTR Program. With powerful data, GSE and BPS can seek additional funding to sustain and grow the UBTR Program at the end of the grant period.

Objective 3: Provide ongoing support for program participants, both residents and teacher leaders, through an innovative collaborative consortium for at least the first five years of their teaching careers

The benefits of providing mentoring/coaching support for beginning teachers has been well-documented in national research. It is in beginning teachers' second year that we have witnessed a rapid growth in their knowledge and skills and an ability to focus on evidence of their students' learning, rather than on their own teaching behaviors.

For these reasons, after the year-long residency, the UBTR proposal will provide continued and ongoing support for program participants through the UBTC. In order to impact student learning at a school-wide level, in a way that is sustainable, UBTC, which will be the virtual and physical location for current and former residents and teachers to receive and offer ongoing support, professional development, and insight beyond the project period/stipend

compensation. Effectively, this will become the Buffalo Teacher Residency Network (BTRN). It will be a space where current or former residents and teachers can receive assistance, share ideas that work, or solicit advice on a project or lesson. It will function on two levels: it will be a virtual professional learning community (facilitated by the program director and described earlier); and it will also be physical, located at the University at Buffalo North Campus within the Teacher Education Institute.

Support for residents during their early career will be provided in four distinct ways. First, we propose to train Specialist Coaches who will serve as mentors to UBTR graduates as they embark on their new careers. SCs will be recruited based on cohort needs and can include BPS teachers on special assignment, TEAs, GSE graduates, and FIR. The number of SCs hired will be based upon the number and needs of UBTR graduates. The amount of release time, full or partial, will be based upon the needs of BPS in terms of the content area and number of UBTR graduates hired at the school. The SCs will receive the same training as MTs and will also participate in regular professional development meetings and in the UBTC to continue to strengthen their mentoring skills and reinforce the use of formative assessment tools and mentor protocols. SCs will be expected to meet regularly with their mentees to observe and coach the beginning teacher, assist with planning and analyzing student work and designing classroom management plans, teach demonstration lessons, facilitate communication with administration and parents, and assist in providing resources that might be needed. The beginning teacher, with the help of his/her SC, will develop an individual learning plan that focuses on content knowledge and teaching skills in which the beginning teacher needs to grow. The goals for the plan are based on professional teaching standards. Over the course of the year, the beginning

teacher and SC will periodically review the plan, collect and analyze evidence of growth in goal areas, and prepare for summative evaluations by school administrators.

A second form of support provided to UBTR graduates will be professional learning communities (PLCs) facilitated through participation in the UBTC. Because the residency year is structured to provide a collegial, collaborative environment among residents and faculty in the host schools, residents come to expect and depend upon this type of support. However, after the residency year, participants may find themselves teaching in schools that do not have this kind of supportive environment. Evaluations of the Boston and Chicago residency programs have found that this lack of a collaborative, collegial environment has had a negative impact on the performance and job satisfaction of their graduates (A. Listak, personal communication, May 7, 2009). The benefits of PLCs are also well documented in the literature. PLCs emerge from research on school reform efforts that take teacher learning seriously (Louis & Kruse, 1995; McLaughlin & Talbert, 2001). This professional capacity-building research has found that what teachers do outside the classroom affects the extent to which school reform efforts are successful, and, more importantly can impact instruction in positive ways (Bryk, Camburn & Louis, 1999; Louis & Kruse, 1995; McLaughlin & Talbert, 2001; Talbert, Scharff & Lin, 2008). Several features of these communities stand out: (1) they are democratic—power is distributed fairly evenly and participation is voluntary; (2) they are focused on teaching practice rather than administrative issues; and (3) they are deftly facilitated. Facilitation of these meetings is important because it provides a structure, including regular meeting times, meeting protocols, and a safe space that is insulated from the day-to-day business of schools (Bryk et al., 1999; Louis & Kruse, 1995; McLaughlin & Talbert, 2001). We propose to facilitate the formation of PLCs by providing space and a regular meeting time for UBTR graduates at a convenient central

location. We will also provide an experienced facilitator to run these meetings. The exact content of the meetings will not be pre-established, but the facilitator will help to guide the group to focus on issues of practice that are consistent with UBTR goals.

A third form of support for UBTR graduates will be participation in the TRSI. During these week-long workshops/seminars, participants, which will include veteran and novice teachers and administrators, will practice collaborative professionalism in order to (1) increase their subject matter mastery; (2) develop materials that motivate students; (3) develop curricular models that fit their needs; and (4) exercise intellectual independence. Expert educators from BPS and GSE will design and lead these seminars. The UBTR graduates will participate in customized sessions during their first three years of teaching, and will be given priority in registering for workshops in years 4, and 5. In addition, as the UBTR participants matriculate through the program, if significant content or pedagogical needs are identified, these needs will inform the development of the content focus of the TRSI.

The fourth form of support involves providing support for UBTR alumni continuing their participation in the UBTC during their fourth and fifth years of teaching. As the BTRN grows, and as alumni become more experienced and skilled, it is expected that graduates will increasingly take on leadership roles in in their schools and in the UBTC, strengthening the BTRN.

Objective 4: Develop and support a sustainable, district serving, STEM professional development program.

The professional development for science, technology, engineering and mathematics plus computer science (STEM + C) will be created and sustained using varied professional development contexts: (1) summer workshops/seminars outside of the classroom; (2) virtual

online modules during the school year; and (3) monthly ongoing sustained professional development centered on classrooms. We envision interdisciplinary STEM + C teams collaboratively learning and designing together in professional learning communities (PLCs). One important innovative component of the professional development is that the teaching of computer science principles will be infused across the teaching of the STEM disciplines. Below we discuss STEM professional development in section 4a. and the infusion of computer science across the STEM disciplines in section 4b. Although we discuss STEM and Computer Science separately, we envision the infusion and integration of Computer Science into STEM.

4a. STEM Professional Development: Essential to teaching all STEM disciplines is a depth of subject matter knowledge in science, technology, engineering and/or math *and* the knowledge required to make the subject matter accessible to the students, often referred to as pedagogical content knowledge (Shulman, 1986). Both types of knowledge are critical components of teacher competences that impact student achievement (e.g., Diamond, Maerten-Rivera, Rohrer, & Lee, 2014). Pedagogical content knowledge emanates from three other knowledge bases: (a) subject matter knowledge; (b) pedagogical knowledge, and (c) knowledge of the context (e.g., community, school and student background). The job of a teacher is to use their pedagogical content knowledge to transform the subject matter knowledge into instruction delivered to students in relevant and meaningful ways. The residency model, unlike the traditional semester-long student teaching model, provides a sustained supportive context for the development of each component needed to advance novice teachers knowledge in each area, providing opportunities for refining their understanding across multiple iterations. Professional development programs that are intensive and are short in duration are less effective than those

that are 150 hours per year or more, thus supporting the idea that a certain amount of professional development is needed to show effects on student achievement (Yang, Liu, & Gardella, 2018).

To illustrate the benefits of distributing professional development over extended time and in varied professional development contexts, we take one pedagogical concept to explain what the STEM professional development might look like. It is important for TRs in engineering and science to develop the ability to implement an inquiry based learning approach so that the focus of science instruction is on conceptual understanding and thinking instead of memorization of facts and procedures (Bybee, 1995). UBTR is proposing an approach called Interdisciplinary Science Inquiry (ISI) as pedagogical framework for teaching through an inquiry approach. The ISI framework is centered on the universality of science and the connection between science and mathematics and engineering. According to Yang, Liu, and Gardella (2018), the ISI pedagogical practice aligns with science inquiry, science and engineering practices and interdisciplinary concepts in science. Given that it will be important to provide active learning opportunities for residents and mentors to experience ISI, UBCR will support professional development provided in the summer workshops/seminars for TRs, MTs, SCs, and administrators. Through UBTC and TRSI, participants will have the opportunity to engage in professional development, specific to their urban context, where they will increase their understanding of the ISI pedagogical approach, subject matter, materials that motivate the students, and instruction that aligns with curriculum and standards. The summer professional development will provide a base to launch the virtual models and monthly sustained professional development for ISI. For instance, it is through these modules that they can reference previous content related to ISI and be introduced to new subject matter and pedagogical techniques to deepen their learning. Also embedded in the

UBTR model across school year will be monthly on-going professional development sessions where refinement of subject matter knowledge and pedagogical practices can be learned and new information can be shared all in concert with one another. Most beneficial is the network to that will support the implementation of year-long PLCs. Through this one example, we illustrate how each phase of the sustained professional development supports learners as they deepen their practices and knowledge in STEM related disciplines.

4b. Computer Science Professional Development

In the UBTR model, our goal is to infuse the teaching of computer science content into the STEM Disciplines (STEM+C). By taking a STEM + C approach, TRs and their students will have the opportunity to acquire a deeper understanding of computing in the world around them, solve real problems, and understand human behavior through computer science concepts (PCAST, 2010). We know that a fundamental component of residency models such as UBTR is sustained experience in the field. Research indicates that teachers who receive 49 hours of research-based professional development spread over 6-12 months increase student achievement by 21 percentile points (Yoon, Duncan, Lee, Scarloss, & Shapley, 2007). Conversely, short professional development experiences lasting less than 14 hours demonstrate no significant effect on student learning (Darling-Hammond, Wei, Andree, Richardson, & Orphanos, 2009). This research points to the importance of having a sustained duration of professional development, which is the cornerstone of the UBTR model. It is through these collaborative sustained PD experiences that residents will have the opportunity to deepen their subject matter knowledge of computer science principles (creativity, abstraction, data, algorithms, programming, internet & impact) and pedagogical techniques (Mouza, Pollock, Pusecker, Guidry, Ching, Atlas, & Harvey, 2016). Mouza et al (2016) also found that teachers incorporate

new learning practices into their teaching when the professional development simultaneously focused on subject matter and pedagogy through a focus on curricula and lesson/unit design.

The same three professional learning contexts will be used for the infusion of computer science teaching in the STEM disciplines. The first interaction between the TRs, MTs, SCs, and building principals will be at the TR Summer Institute (TRSI). The equivalent of one full day of computer science training will be conducted. This training will be split across two half days (two blocks per day). The purpose of this training will be to provide (1) a comprehensive overview of computer science whereby the introduction of fundamental computer science concepts (variables, data types, control structures, I/O, file handling, modular programming, arrays, object-oriented programming concepts) are introduced and (2) instruction on how to integrate computer science into STEM classes by specifically introducing residents to the programming language options that are available and best practices on how to incorporate computer science into a specific domain (STEM+C). Participants will be encouraged to bring a STEM-based lesson plan for the later portion of the training to begin to work on modifying the lesson plan to incorporate computer science.

Upon completion of TRSI, virtual modules will serve as the second stage in the STEM professional development portion of the residency program. Using the information obtained at the TRSI, residents will select from a number of different modules, each one unique to a specifi programming language (C, C++, Python, Scratch, etc.) and platform (Windows, macOS, Chromebooks , etc.). The instruction in these modules will assist the residents in preparing themselves to integrate computer science into their individual classrooms. These virtual module will also provide support with regard to integrating computer science into a specific STEM field (STEM+C).

The third stage of the residency program will provide professional development through a (PLC) that meets once per month during the school year. A computer coach, versed in computer science and STEM will work with the residents at their individual schools, assisting in the development of lesson plans, providing technical support, and supporting instruction in the classroom. The computer coaches will be experts in computer science, with experience teaching computer science in the classroom, and will have experience working with students in the K12 domain.

Throughout all phases on professional development on-going support will be provided in the following areas to support the STEM+ C model:

- Providing time for residents and mentors to identify areas in their curriculum that works synergistically with the computer science curricula
- Assisting residents and mentors in draw connections between computer science principles and core curricular standards
- Providing active learning strategies, hands-on learning, and opportunities to for teachers to experience computer science activities in a supportive and collaborative learning environment.

Objective 5: Strengthen the role of BPS secondary school administrators in supporting novice teachers and teacher leaders.

The UBTR proposal recognizes the crucial role that school leaders play in supporting beginning teachers. Part of this support comes from creating working conditions where new teachers can succeed; research on new teacher turnover indicates that new teachers leave not because of their students but because of poor working conditions that affect their teaching

capacity (Simon & Johnson, 2015). According to Simon and Johnson, the conditions most conducive to teacher satisfaction are social in nature, including teacher collaboration. Another part of this support is more professional in nature. Principals who are committed to developing and supporting new teachers retain teachers at a higher rate than their peers (Brown & Wynn, 2009).

Building on the premise that school leadership and new teacher support go hand in hand, the UBTR proposal requires that formal building leaders in host schools that receive cohorts of TRs go through the same five day Teacher Residency Summer Institute provided to mentor teachers and residents. In addition to learning about the co-teaching model and the computer science professional development, building leaders will have separate sessions to learn how to effectively support the TR model and Collaborative Professionalism within their buildings. This training will ensure that school leaders fully understand the kind of support that will be provided by UBTR coaches and their role as leaders in fostering such support. This training will also serve as a way for building leaders involved in the Consortium to develop professional networks around how to support teachers and coaches in their schools. Finally, this requirement is based on evidence from a similar program in Virginia (Virginia Commonwealth University) which revealed the challenge of ensuring that principals understand the role of mentors in developing a culture of collaborative professionalism must be addressed if the model is to be effectively implemented. Aligning the training of UBTR coaches and host school administrators will create a shared, common approach to supporting novice teachers and improving instruction and ultimately improving retention.

The separate session for BPS administrators will be co-taught by UB Faculty from the Department of Educational Leadership and Policy and cabinet-level personnel from BPS.

Instructors will be familiar with the co-teaching model as well as best practices in fostering collaborative professionalism in schools. The workshop will be designed to: (1) help administrators understand the importance and value of supporting and nurturing teacher leadership and mentorship; (2) assess their knowledge and skills in promoting teacher leadership and mentorship; and (3) develop an action plan to develop teacher leaders and mentors among their faculty.

Description of Induction Activities: See Objective 3.

Capacity to Yield Results that Extend Beyond Federal Funding

As residency programs increase in number and grow in size, program sustainability has emerged as an essential consideration. In planning UBTR, elements of sustainability have been built in from the beginning, with partners contributing in ways that will enable the program to grow, as well as to ensure that it will continue beyond the grant period. Program components related to sustainability include the UBSubs initiative, the UBTR Teacher Consortium (UBTC), and the UBTR Summer Institute (TRSI). The TRSI grew out of conversations with BPS and promises to be mutually beneficial. BPS leadership suffers from a chronic shortage of substitute teachers, resulting in numerous challenges and lost learning time. Built into UBTR is an agreement that allows TRs to serve as substitute teachers one day per month at no cost to BPS. Benefits to this agreement are manifold: teachers in the building who know they will be absent can co-plan with TRs, TRs can build self-efficacy by occasionally acting as teachers of record, administrative are able to solve an immediate problem in cost-effective manner. In addition, as part of preparing TRs to serve as substitutes, we will establish UBSubs, a professional development workshop for qualified candidates wishing to substitute teach. In addition to

serving as a recruitment vehicle, UBSubs will enhance the quality of substitute teachers by creating a well-prepared pool of substitutes for BPS and, if extended to the region, could generate funds that contribute to UBTR sustainability.

Similarly, the UBTC will provide immediate benefits to teachers and administrators through customized professional development that supports improving teacher effectiveness through collaborative professionalism while, at the same time, offering promise for eventual contributions to sustainability. By demonstrating effectiveness through rigorous research conducted during the program, demand for professional development offered through UBTC will grow, creating opportunities to generate additional funds. UBTR is built on the idea that effective educational reforms are context-based; therefore, the work of UBTC will involve both serving as a model of holistic, collaborative, community-based teacher education *and* providing the tools for schools and school districts to investigate what works for teachers and learners in their communities and then implement transformative reforms that meet those needs.

An additional factor related to sustainability involves BPS cost savings related to improved teacher retention. Expected increased retention of TRs, in comparison with newly hired teachers, will result in significant cost savings that can be invested in UBTR. Nationally, turnover among new teachers is especially high, with 40 to 50 percent leaving the profession after five years (Teacher Attrition, 2014). While non-financial implications of this turnover including decreased morale among faculty and students that can harm school culture and hurt student achievement, financial consequences are significant as well. A 2007 report estimated that the cost of turnover ranges from [redacted] per teacher (from a not-poor, small, rural school district) to [redacted] per teacher (from a low-income, large, urban school district) (Barnes, Crowe, & Schaefer, 2007)), and such expenses have certainly increased in the past decade.

The UBTR's strong partnership with BPS will create opportunities for ongoing data-driven discussions wherein financial implications can be explored to plan for sustainability and growth.

Further evidence of sustainability involves the contributions BPS has already committed to, including providing financial support for the UBTR director during the first three years of the program. This investment demonstrates faith in the endeavor and offers time for UBTR to prove effectiveness and explore additional mechanisms of synergy that can support the project beyond the time period of this grant.

Demonstration of Exceptional Approaches to Project Priorities

Absolute Priority 2: This program demonstrates an exceptional approach to Establishment of Effective Teacher Residency Programs in two ways. The first innovation involves the delivery of coursework related to the EdM that TRs will earn at the conclusion of their residency year. Rather than being taught in the traditional format, designed primarily to meet the needs of the university schedule through 3-credit courses taught in a predetermined sequence, program coursework will be provided through modules that align to the needs and experiences of TRs, as collaboratively determined by BPS personnel and UB GSE faculty. For example, a course related to classroom management, rather than concentrating content and strategies across one semester, might be divided into three 1-credit modules that address the changing responsibilities and abilities of TRs. Module 1, devoted to theories of classroom management and strategies for initiating a collaborative, productive learning environment, could be offered in summer prior to the start of the school year, allowing TRs to work with MTs to apply the theories and skills and reflect on their effectiveness. Module 2, offered in early fall, might focus on improving student engagement through rigorous curriculum, and Module 3 could address differentiation and group

work. This "just-in-time" curricular delivery system provides opportunities for immediate application of learning, and contributes to the development of a collaborative professional identity, since TRs, from the very beginning of their programs, will be inducted into collaboration as a cultural norm. The second innovation involves the implementation of the UBTC, a multifaceted, dynamic approach to supporting TRs, MTs, TEAs, SCs, and schools leaders. Components of the UBTC will include the TRSI, which will offer a range of credit-bearing and non-credit-bearing professional development activities designed to promote a culture of collaborative professionalism. Another component of UBTC will be ongoing professional development. UBTC will provide virtual and in-person workshops for TRs, teachers, and administrators, and will serve as a clearinghouse offering customized pedagogical and content area expertise that novice and veteran teachers can access as needed. Building a culture of collaborative professionalism has been proven to improve student achievement, increase teacher retention, foster teacher and student efficacy, and cultivate an environment that supports continuous improvement through innovation. To these ends, a third component of the UBTC is the BTRN, an alumni network of TRs learning to be teacher leaders who will extend the impact of UBTR and help ensure its sustainability. Because an essential aspect of teaching effectiveness involves retention, program graduates will benefit from an assigned SC for their first three years of teaching, when they will also have a BPS-assigned mentor and be funded to participate in the TRSI and UBTC. During their fourth and fifth years of teaching, program graduates will continue to participate in the UBTC, gradually assuming leadership roles in the BTRN.

Competitive Preference Priority 1: Promoting Science, Technology, Engineering, and /or Math (STEM);

An exceptional aspect of the UBTR program is its approach to infuse the teaching of computer science with STEM (STEM + C). Computer science includes, but is not limited to the teaching of computational thinking, which is critical to the students our residents will educate. These students will enter into a workforce heavily influenced by computing, therefore it is essential for them to understand computational thinking ideas and tools in grades K-12 (Barr & Stephenson, 2011; NGSS Lead States, 2013). Research suggests that students exposed to computational thinking increase their problem-solving and critical-thinking skills in varied content areas (Calen et. al, 2015).

Teacher education programs, like UBTR, play a critical role in preparing knowledgeable educators who can draw upon the trans-disciplinary nature of computational thinking to educate their students (National Research Council, 2010) in all the STEM fields. According to Yadav, Stephenson, and Hong (2017), preservice teacher education is an optimal time to "provide future teachers with the knowledge and understanding that they require to successfully integrate computational thinking into their curricula and practice". Critical to the success of the STEM + C model is the sustained duration of the professional development. Also critical to the success o the professional development are the following design features: (a) facilitates deep learning of subject knowledge and pedagogical knowledge, (b) is collaborative in nature, (c) provides opportunities for active learning, (d) makes connections between curriculum and assessment, an includes sustained support across the residency.

Competitive Preference Priority 2:Promoting Effective Instruction in Classrooms and Schools.

This project demonstrates an exceptional approach to both aspects of this competitive preference priority in that it focuses on the recruitment and retention of highly effective educators with explicit attention to increasing diversity in the teaching workforce of the Buffalo Public Schools. Building on what has been learned from successful TR models, recruitment efforts will explicitly target applicants from historically underrepresented groups who are familiar with and committed to BPS. Consistent with the program goal to diversity the BPS teaching force, candidates and TRs will be mentored by program staff from initial contact through application, orientation, during their residencies, and into their teaching careers. Program recruitment will aim to create a pipeline of excellent teachers whose demographic characteristics reflect the schools and communities where they will teach; therefore, recruitment strategies will be dedicated to selecting candidates to create cohorts that are racially and ethnically diverse.

As mentioned in the description of Exceptional Approaches to Absolute Priority 2, TRs will complete coursework toward their MEd through modular engagement with content related to real-time instructional needs. To further support instructional effectiveness during the residency and their first three years of teaching, TRs will be mentored and coached by MTs and SCs who have been trained through the evidence-based model designed by the St. Cloud Academy for Co-Teaching and Collaboration. In addition, to enhance instruction and increase retention, program alumni will benefit from five years of post-licensure professional development provided, in virtual and face-to-face formats, through the UBTC. Instructional effectiveness will be strengthened by early career mentoring and participation in UBTN, as described in the section Exceptional Approaches to Absolute Priority 2.

SECTION THREE: QUALITY OF MANAGEMENT PLAN

Work Plan and Timeline of Activities

The work plan and timeline of activities below represent a thorough and thoughtful plan to implement all project goals and objectives on time and within budget.

Project Goals: 1) Increase the number of learner-ready teachers in the city of Buffalo; 2) Diversify the pool of teachers in the city of Buffalo; and 3) Increase the number of teachers who stay in the teaching profession for a minimum of 5 years.		
Objective 1: Design and establish an innovative teacher preparation program for Buffalo Public Schools (BPS) high need schools		
Major Project Milestones	**Timeline**	**Persons Responsible**
UBTR Director, TEI Director, and leadership team attend St. Cloud training session.	Summer 2018	Rosenblith, Etopio
Identify members of curriculum design team	August, 2018	Etopio, Gorlewski, Director
Hire UBTR Assistant Director	Fall 2018	Rosenblith, Etopio
Leadership team from UBTR and BPS attend National Conference on Co-Teaching at St. Cloud University	October 24-26, 2018	Director
Develop 15-month UBTR Program	Fall 2018-Spring 2019	Design Team
Develop application and selection process for host schools	Fall 2018/Winter 2019	Director/Residency Liaison/Advisory Council
Develop criteria and selection process for MTs	Winter 2019	Director/Residency Liaison
Pilot new curriculum	Summer 2019-Summer 2020	Etopio/Gorlewski
Revise and refine curriculum based on formative assessment of pilot	Summer 2020-Summer 2021	Gorlewski/Design Team
Implement revised curriculum	Summer 2021-Summer 2022	Etopio/Gorlewski
Continue to monitor and revise curriculum as needed	Summer 2022-Summer 2023	Etopio/Gorlewski/Design Team

Objective 2: Objective 2: Recruit and prepare 50 highly effective teachers for BPS with particular attention to the recruitment of candidates from diverse backgrounds.		
Major Project Milestones	**Timeline**	**Persons Responsible**
Hire UBTR Assistant Director	Fall 2018	Rosenblith/Etopio
Develop UBTR promotional materials	Fall 2018	Director

Develop application and selection process for residents	Fall 2018/Winter 2019	Director/Residency Liaison
TRs begin their EdM program	Summer 2019	Director/Residency Liaison
Place residents with MTs	Summer 2019	Director/Etopio
TRs complete their EdM	Summer 2020	Director
BPS hires first cohort of TRs	Fall 2020	BPS HR Director

Note: Three additional cohorts of 40 (total) TRs will complete the same process outlined above.

Objective 3: Provide ongoing support and professional development for program participants, both residents and teacher leaders, through an innovative consortium for at least the first five years of their teaching careers.		
Major Project Milestones	**Timeline**	**Persons Responsible**
Design infrastructure for UBTC	Fall 2018-Spring 2019	Assistant Director/Residency Liaison
Within UBTC infracture, implement first UBSI for MTs, BPS administrators, and first cohort of TRs. UBSI offerings include coursework for TRs, STEM+C integration, co-teaching, and collaborative professionalism, as well as sessions tailored for BPS needs.	Summer 2020	Assistant Director/Advisory Council
Follow up UBSI with ongoing PD, including facilitation of PLCs with particular attention to STEM and STEM+C.	Fall 2019-Spring 2020	Assistant Director
Develop criteria and selection process for SCs	Winter 2019	Director
Select SCs based on content area needs of UBTR graduates	Spring 2020	Director/Residency Liaison
Train and provide ongoing professional development for SCs through UBTC	Summer 2020-Spring 2021	Assistant Director
Assign UBTR graduates to SCs	Summer 2020	Director/BPS liaison
New TR cohort and their MTs and principals, plus TR graduates, their SCs, and principals of buildings where graduates are hired participate in UBSI	Summer 2020	Director
SCs continue to work with UBTR graduates for three years	First cohort of TRs receive services Fall 2020-Spring 2023; repeat for each cohort	Assistant Director
PLCs established for UBTR graduates	Fall 2020 – Spring 2023	Assistant Director
UBTR graduates, colleagues, and administrators continue to receive customized support through UBTC and participation in UBTN	Fall 2023-Spring 2025, and beyond	Assistant Director

Objective 4: Develop and support a sustainable, district serving, STEM professional development program.		
Major Project Milestones	**Timeline**	**Persons Responsible**
Provide full-day STEM+C introductory workshop as part of UBSI	Summer 2019	Assistant Director/Advisory Council
Continue STEM and STEM+C professional development through virtual modules offered through UBTC	Fall 2019-Spring 2020	Assistant Director
RCs and MTs participate in monthly PLC meetings facilitated in schools by a computer coach.	Fall 2019-Spring 2020	Assistant Director
STEM+C integration continues through UBSI with advanced offerings for program graduates as well as repeating the introductory cycles with incoming cohorts of TRs and their MTs.	Summer 2020-Spring 2025 and beyond	Assistant Director/Advisory Council

Objective 5: Strengthen the role of BPS school administrators in supporting novice teachers and teacher leaders.		
Major Project Milestones	**Timeline**	**Persons Responsible**
Through UBTC, provide co-teaching and collaborative professionalism training to host school principals	Summer 2019-Spring 2020 (repeats each year for new host principals)	Director/Assistant Director/Residency Liaison
Through UBTC, provide co-teaching and collaborative professionalism training to principals of schools where program graduates are hired.	Summer 2020-Spring 2021 (repeats each year for new principals)	Director/Assistant Director
Through UBTC, facilitate customized PLCs for BPS administrators, with special attention to induction and retention.	Summer 2019-Spring 2025 and beyond	Director/Assistant Director

Institutional Support (facilities, equipment, supplies, and other resources): In accordance with TQP requirements, there is 100% match for all funds received. Details are provided in the Budget and the Budget Narrative.

Responsive Governance and Decision-making Structure: The Advisory Council will serve as the oversight and advisory board to the UBTR Program, meeting quarterly to review ongoing formative assessments and evaluation data to determine needed revisions and refinements to project components. In addition, GSE, through TEI and the Department of

Learning and Instruction, will oversee the day-to-day governance and management of the UBTR Program.

Qualifications of Key Personnel and Responsibility for Project Implementation:

Suzanne Rosenblith, Dean: Dr. Rosenblith, Dean and Professor in the UB Graduate School of Education, will oversee all aspects of the project. Dr. Suzanne Rosenblith was appointed the ninth dean of the UB Graduate School of Education after a nationwide search, and began leading the school in July 2017. She previously served as the associate dean of undergraduate programs in the College of Education at Clemson University, where she helped create numerous educational programs and a reorganization of the college. She was the initial architect of Clemson's Teacher Residency program and worked directly with five area school districts to craft a district-serving program. This program was embedded in Clemson's undergraduate teacher preparation program, extending it from a 4-year to a 3+2 (BA-MED), and was officially launched after her departure from Clemson. Since arriving at UB, Dean Rosenblith has placed a high priority on developing relationships with the community, and has made a concerted effort to engage with area schools and other partners. For example, she has agreed to serve on the Board of Directors for Buffalo Prep, a college access program for students in the city of Buffalo; is engaged with the Buffalo Public Schools in multiple ongoing initiatives; and has begun to form partnerships Erie 1 BOCES school districts. Dean Rosenblith has also initiated a faculty in residence (FIR) program. The goal of the FIR is to enable faculty to engage with school and community partners in mutually beneficial, "embedded" site-based research, thus providing opportunities for schools, agencies and university personnel to learn from each other. Undergirding these relationships is a belief that implementing evidence-informed practices, with fidelity is essential for impacting individuals and communities and establishing systems-based

reform. She will be responsible for ensuring that all personnel are hired and supervised in accordance with the requirements of various stakeholders and agencies.

Elisabeth Etopio, PhD: As Assistant Dean for Teacher Education at the University at Buffalo, Elisabeth Etopio oversees all clinical components of teacher preparation, ensuring that programs are administered consistently and that all program completers are poised to be highly effective teachers. Her research includes examination of the varied factors that impact preservice teacher's professional development. Specifically, she focuses on social contexts of teaching and learning and how they intersect with aspects of cognition, affect, and behavior. Recently, she has collaborated with an interdisciplinary team to create a virtual reality environment to enhance the classroom management skills of preservice teacher, implement the technology within teacher education classes, and assess the outcomes. As the point person for teacher education and licensure, Dr. Etopio will ensure that residents are prepared for certification and that state standards and requirements are fulfilled. She also supervises training and efforts of TEAs and will participate in the development and implementation of the UBSI and UBTC.

Julie Gorlewski, PhD: Associate professor and chair of the Department of Learning and Instruction in the Graduate School of Education at the University at Buffalo, State University of New York, Dr. Gorlewski is scholar educator who has New York State Certification in Secondary English Education and Elementary Education/Early Childhood (B-6). Her teaching experiences span PreK through graduate school, and include interdisciplinary initiatives such as instructional technology and STEM education. Dr. Gorlewski has a wealth of knowledge about teacher education and development, and has led numerous curricular and assessment endeavors, as well as educational conferences devoted to increasing equity and diversity in education. She

has authored 10 books, as well as over 20 peer reviewed manuscripts. From 2013-2018, Dr. Gorlewski served as editor of *English Journal*, the flagship publication of the National Council of Teachers of English. Her research projects involve equity, literacy, and cultivating critical dispositions with preservice and practicing teachers. In her role as department chair, Dr. Gorlewski will ensure that degree requirements are met and will oversee research components of the project are completed in a timely, effective manner. Dr. Gorlewski will be responsible for working with GSE faculty, master teachers, and BPS personnel to design the curriculum for the new residency model of preparation. She will also work with faculty engaged in the UBSI and UBTC.

Project Director (TBD - hired in July 2018): The project director will ensure that project activities are developed and implemented according to prescribed timelines, directing the efforts of project staff, ensuring that all funds are expended in a timely manner, and representing the project at the Advisory Council meetings. The director will be responsible for the day- to-day implementation of the selection and mentoring components of the UBTR Program. The Director will work collaboratively with GSE faculty, BPS staff, and the assistant director to develop a recruitment plan and selection process for residents, identify host schools, place residents, and monitor their progress. The director will: (1) oversee the establishment of criteria and a selection process for identifying TRs and MTs, and SCs; (2) serve the primary contact person with project partners; (3) lead recruitment efforts; (4) collaborate in the development of the selection process for TRs; (4) oversee the hiring and daily activities of the assistant director, who will also coordinate the UBSI and UBTC.

Assistant Director (TBD - hired in Fall 2018). The assistant director will support the director in all daily activities of UBTR, and will be the lead designee to serve provide training

for MTs and SCs. The assistant director will serve as coordinator of the UBTC and UBSI, and will, in this capacity, (1) collaborate to develop and implement the UBSI; (2) facilitate the implementation of the STEM+C PD sessions; (3) facilitate the monthly professional development PLCs with teachers and principals; (4) monitor the effectiveness of MTs and SCs; and (5) coordinate closely with the director and BPS personnel to ensure that the needs of residents are being met by the MTs and SCs.

Xiufeng Liu, Lead Project Evaluator - Dr. Liu is a Professor of Science Education in the Graduate School of Education. His main research interests include measurement and evaluation in science education, technology-enhanced assessment and learning in science, teacher professional development, and public understanding of science. He is an immediate past Associate Editor for the *Journal of Research in Science Teaching*, the number-one ranked science education research journal in the world, and has been a guest-editor of special issues for the *International Journal of Science Education* and the *Journal of Science Education and Technology*. He is widely recognized as an expert in measurement and evaluation in STEM education. He has published 10 books, 63 refereed journal articles, and 31 refereed book chapters, and more than 100 invited talks, workshops, and national and international conference presentations. He is the author of a highly regarded book in science education, *Using and Developing Measurement Instruments in Science Education: A Rasch Modeling Approach* (Information Age Publishing, 2010). Dr. Liu has also successfully mentored 18 doctoral students and five post-doctoral researchers. Dr. Liu will oversee all aspects of program evaluation, including data collection and analysis, reporting, and research connected to effectiveness.

Corrie Stone-Johnson, PhD - Dr. Johnson is associate professor and coordinator of the Education Administration program in the Educational Leadership and Policy department of GSE

In the current accountability context, in which pressure to raise student achievement encourages teachers to focus on their individual classrooms rather than act collectively, understanding how strong teacher cultures are supported and sustained, and the role school leaders play in building the types of relationships that such cultures require is critical. Dr. Johnson's work interrogates these professional relationships in two related streams. The first stream explores the types of leadership that foster strong relationships, while the second identifies factors that impinge on the way relationships and shared cultures develop. Because she is interested in educators' lived experiences in schools, Dr. Johnson relies primarily on qualitative research methodologies, such as case study and ethnography, to engage in data collection and analysis. Her work on these issues has been published in a variety of venues, including eleven research articles in scholarly journals such as *Educational Administration Quarterly, Journal of Educational Change,* and *Teachers and Teaching: Theory and Practice*; five book chapters; and a full-length book, *Generational Identity, Educational Change, and School Leadership*, published in 2016 by Routledge. Her research has also been supported by five university-level seed grants. She the Associate Editor of *Leadership and Policy in Schools* and has recently become a board member of the *Journal of Educational Change*. She advises students in our doctoral program and teach in the doctoral program, the masters program, and LIFTS. For this project, Dr. Johnson will collaborate to oversee professional development activities involving principals and other school leaders, contributing to research that will influence the field.

Lynn Shanahan, PhD - Dr. Shanahan is an Associate Professor of Literacy Education in the Department of Learning and Instruction, University at Buffalo, SUNY. Her previous research is focused on (a) Disciplinary Literacies and STEM at the elementary and middle school levels; (b) video reflection as a critical tool for teacher growth and development; (c) teacher's influence

on the composition of science text through digital tools; and (d) use of multiple sign systems (i.e., images, words, gestures) while communicating when reading and writing. She will lead efforts related to disciplinary literacies in the STEM subject areas and provide professional development.

Kris Schindler, PhD - Dr. Schindler is actively involved in various STEM Mentoring & Outreach Activities in K-12 schools in western New York. He co-taught a Teacher Center workshop that trained K-12 teachers on how to incorporate STEM activities and demonstrations in their classrooms, taught another Teacher Center workshop that trained middle and high school teachers on how to code and integrate coding into the classroom, and served as a volunteer facilitator of STEM outreach in K-12 schools, including participating as a volunteer in the "Science is Elementary" program. In a project for the **American Society for Engineering Education (ASEE), Dr. Schindler served** as secretary, awards chair, vice chair, and chair in the section since 2011. While section chair, Dr. Schindler was on the Zone 1 executive board. Zone 1 comprises three sections of ASEE, covering the northeast portion of the United States. In 2013 and 2016, Dr. Schindler co-chaired the section's annual conference. **In addition, Dr. Schindler** was on District Planning Team (*aka*, District Student Achievement Team) for Alden Central School. In this capacity, he was the higher education representative of the team which focuses on analyzing and assessing the district to suggest changes and improvements that the district should make as they move forward in order to provide a quality education which meets the needs of their students. The district is proactive in their approach toward incorporating STEM into their K-12 curriculum. Dr. Schindler is also Co-director of the Center for Socially Relevant Computing, which is dedicated to the development of socially relevant systems. The Center fields projects from the community, many of which involve the development of assistive

technology for the disabled. Students in UB's Computer Science and Engineering Department's Software Engineering and Hardware/Software Integration classes work in the lab, along with students working on supervised research projects. The Center's projects include (but are not limited to): an augmentative communications device for the speech impaired, an interactive technology-based learning environment for preschool and elementary school aged children, a single switch interface for a PC which allows quadriplegics to use a computer, and a sensory environment to assist therapists, teachers, and nurses to teach choice-making skills to children with disabilities. For UBTR, Dr. Schindler will oversee and implement the STEM+C initiative from inception through program evaluation.

Residency Liaison (TBD - hired in Fall 2018): The UBTR Residency Liaison will collaborate with GSE and BPS personnel to ensure fidelity to the UBTR goals and outcomes within the context of BPS, contributing to the development and implementation of recruitment and selection plans, professional development activities, and analyzing data to ensure meaningful formative and summative assessment of goals and outcomes is ongoing and continuously applied to enhance student performance.

(See Appendix H for the qualifications and relevant experience of all key personnel.)

SECTION FOUR: QUALITY OF PROJECT EVALUATION

Capacity: Dr. Xiufeng Liu, Professor in the Graduate School of Education will conduct the project evaluation. Dr. Liu is an expert in measurement and evaluation with over 100 refereed publications. He has 16 years of experiences in conducting measurement and evaluatic research for federally-funded programs. Sample past evaluation projects include NSF-funded ETS Earth Science Assessments with Automated Feedback (ESAAF) ($2.5M), US Department of Education funded Highland Falls-Fort Montgomery Central School District (Hudson Valley,

NY)'s Technology Teacher Professional Development project ($1.5M), and NSF-funded Genesee Community College/Columbia University Literacy in Biology project ($1.2M). Dr. Liu recently served as the inaugural director for UB's Center for Educational Innovation with one specific mission to support university in assessment and evaluation, and is currently Director of Evaluation for the Buffalo Clinical and Translational Science Award (CTSA), a $16M NIH-funded research, education and community engagement program led by University at Buffalo's Jacob School of Medicine and Biological Sciences. One doctoral student will assist Dr. Liu in conducting project evaluation for this program.

Overall Evaluation Strategy: Evaluation of the UBTR program will be guided by the Program Evaluation Standards (3rd edition) (Joint Committee Standards on Educational Evaluation, 2011). The logic model below provides a framework for both formative and summative evaluation of the program. Informed by the logic model, we will implement formative and summative evaluation using both quantitative metrics and qualitative data to answer evaluation questions.

Specifically, the evaluation of the UBTR Program is designed to provide performance measures as part of the formative and summative information regarding the critical aspects of th program objectives and intended outcomes. As such, the evaluation will focus on both the implementation of the program and on the proposed activities (formative) as well as the expecte outcomes (summative). We will use a variety of collection methods and multiple data sources i an effort to triangulate and cross-validate findings. It is anticipated that the quantitative and qualitative results of the evaluation will be used by program partners to inform implementation and activities by identifying any needed modifications while the UBTR Program is ongoing, an provide valid and reliable measures for reports to US Department of Education.

UBTR Logic Model

Inputs	Activities	Short-Term Outcomes (3 years)	Mid-Term Outcomes (5 years)	Long-Term Outcomes (>5 years)
1. UB/GSE Cullen Foundation Teacher Residence Program 2. UB-BPS Inter-disciplinary Science and Engineering Partnership (ISEP) 3. UB-BPS BUILDS Academy Partnership 4. UB-BPS Literacy Mentoring Program 5. Other Partnerships with BPS such as FAFSA completion project, STEP, Upward Bound, STEP, Liberty, and Dental Care and Education	Objective 1: Design and establish an innovative teacher preparation program for BPS high-need schools	A fully articulated teacher residence program is created and offered annually	The teacher residence program is fully institutionalized alongside other teacher preparation programs	1) Increased number of learner-ready teachers in the city of Buffalo; 2) Diverse pool of teachers in the city of Buffalo; 3) Increased number of teachers who stay in the teaching profession for a minimum of 5 years; 4) Improved student academic outcomes.
	Objective 2: Recruit and prepare 50 highly effective teachers for BPS with particular attention to the recruitment of candidates from diverse backgrounds.	Two cohorts of teacher residents (20 in total) with diverse cultural backgrounds are accepted and retained	Four cohorts of teacher residents (50 in total) with diverse cultural backgrounds are accepted and retained	
	Objective 3: Provide ongoing support and professional development for program participants, both residents and teacher leaders, through an innovative consortium for at least the first five years of their teaching careers.	The UBTR Consortium (UBTC) consisting of both in-person and virtual mentoring is created and operational	a. Increased self-efficacy of TRs in teaching at urban schools b. Satisfaction of MTs, SCs and TEAs and other participants with UBTC c. The UBTC is institutionalized at both UB and BPS	
	Objective 4: Develop and support a sustainable, district serving, STEM + C professional development program.	A comprehensive and effective computer science PD program consisting of both face-to-face and online modules is created and offered	TRs, MTs, SCs and hosting school administrators possess necessary knowledge, skills and attitude to integrate computational thinking into subject teaching	
	Objective 5: Strengthen the role of BPS school administrators in supporting novice teachers and teacher leaders.	School administrators of hosting schools possess knowledge, skills and disposition in co-teaching, teacher mentoring and teacher leadership	Collaborative professionalism is created and maintained in hosting schools	

Objective 1: Design and establish an innovative teacher preparation program for BPS high-need schools.

Short-term Outcome: A fully articulated teacher residence program is created and offered annually.

Mid-term Outcome: The UBTR program is fully institutionalized alongside other teacher preparation programs

Formative Evaluation Question 1: Is the UBTR program theoretically sound, practically feasible and implemented effectively?

Design: An advisory committee consisting of faculty in the Graduate School of Education and College of Arts and Science, and teachers and school administrators from BPS will be formed. This committee will meet annually to review progress and accomplishments of UBTR. One specific agenda item for the annual meeting is to review the BRR curriculum according to the seven principles for effective urban teacher residency programs developed by the Urban Teacher Residency United (UTRU, 2006). The seven principles are: (1) Tightly weave education theory and classroom practice together; (2) Focus on learning alongside an experienced, effective mentor; (3) Group teacher candidates in cohorts; (4) Build constructive partnerships with districts, schools, communities, universities, and unions; (5) Serve school districts; (6) Support residents once they are hired as teachers of record; and (7) Establish and support differentiated career roles for veteran teachers. In addition, the advisory committee will also review the curriculum in the five competence areas described on pages 27-28 of this Project Narrative for meeting the NY State initial and professional certification standards and the Council for the Accreditation of Educator Preparation (CAEP).

In addition, we will also survey annually program participants and other stakeholders on their perceptions of the effectiveness of the program to prepare preservice teachers for the urban classroom. The survey results will help project team to identify program areas in need of refinement and improve program components, implementation, and delivery from one year to the next. Finally, three focus groups will be conducted with teacher residents, school teacher mentors, specialist coaches and administrators, and UB/GSE faculty and TEAs during years 2 through 4 of the project.

Summative Evaluation question 1a: To what extent are UBTR participants more prepared for teaching compared to those who participated in the traditional UB/GSE teacher preparation programs?

Design: The primary approach to determine the effectiveness of the UBTR Program is to compare program participants with non-participants who are in UB/GSE's other teacher preparation programs, i.e., the 1-year post-baccalaureate initiative certification program, 2-year initial and professional certification program, 1-year professional certification program, and a 3+2 baccalaureate and master in teaching program. We will compare students in the above programs based on a common set of measures related to teaching effectiveness and efficacy (GPRA performance measure #1). To determine the impact of participation on teaching effectiveness, UB TEI uses two standardized observation instruments. The Student Teacher Assessment Record (STAR, Form 1.3, Cronbach alpha reliability=0.87) is filled out by TEAs (who supervise and evaluate student teachers during practice teaching) on preservice teachers' content knowledge, pedagogical knowledge, pedagogical content knowledge, professional quality and goals for improvement, and the Student Teacher Evaluation (STEVAL, Cronbach alpha reliability=0.95) is filled out by MTs (who serve as cooperating teachers) on a preservice

teacher's instructional capability (knowledge of subject matter, ability to plan, presentation of lessons, use of variety of methods, use of educational resources, initiatives, evaluation of student performances, relationship with students, classroom management), professional and personal qualities (professional relationships, professional development, responsibility, flexibility, reflection, speech and voice, appearance), and overall evaluation. We will randomly select an equal number of preservice teachers from non-UBTR programs, matched by subject, gender, and other pertinent personal characteristics. Given the small sample size during the initial two years (10+10), we will conduct non-parametric analyses. Parametric statistical analyses will be conducted from year 3 when the cumulated number of student teachers has reached 35. Effect sizes (i.e., Cohen's d) will be calculated for continuous variables to compare the difference between UBTR participants and non-participants on scales of STAR and STEVAL.

To evaluate the extent to which participation in the UBTR Program enhances the efficac of pre-service teachers, the Teachers' Sense of Efficacy Scale (TSES) (Tschannen-Moran & Hoy, 2001) will be administered to UBTR participants and the same matched groups of non-program participants. The TSES has been used to measure the efficacy of preservice teachers and includes three sub-scales on student engagement, instructional strategies, and classroom management. Scale reliabilities have been shown to be sufficiently high, with alpha levels ranging from .87 to .94 (Tschannen-Moran & Hoy, 2001). Again, parametric and non-parametric statistical procedures will be used to determine if differences are significant between UBTR participants and non-participants on the TSES and the three subscales. Effect sizes (i.e., Cohen's *d*) will be calculated for continuous variables.

Summative Evaluation Question 1b: To what extent do UBTR participants persist and are retained in BPS high-need secondary schools?

Design: To measure the extent to which program participants remain in BPS high need-schools, short-term and mid-term performance measures of persistence and retention (GPRA) performance measure #2) will be collected for participants in each UBTR cohort; these data will be collected for each cohort as they move through the three years of the program following the residency period. It will be possible to track the rate of retention for UBTR participants due to the program documentation requirement of their teaching placement.

Objective 2: ***Recruit and retain 50 highly effective teachers for BPS with particular attention to the recruitment of candidates from diverse backgrounds.***

Short-term Outcome: Two cohorts of teacher residents (20 in total) with diverse cultural backgrounds are accepted and retained at least 90%.

Mid-term Outcome: Four cohorts of teacher residents (50 in total) with diverse cultural backgrounds are accepted and retained at least 90%.

Formative Evaluation Question 2: Is the recruitment and retention of the UBTR program effective?

Design: The advisory committee will be asked to review the recruitment and retention procedures and implementation at its annual meeting; they will identify areas for refinement and improvements for subsequent years. In addition, we will include in the annual survey of teacher residents a section of questions related to recruitment and retention in order to assess their perceptions of effectiveness of the recruitment and retention procedures; areas for improvement will be identified and implemented. Finally, a focus group with potential applicants to the UBTR will be conducted annually during years 1-4 to identify issues and areas for improvement associated with recruitment and application.

Summative Evaluation Question 2: To what extent has the program achieved the targeted recruitment and retention goals?

Design: To determine if the targeted recruitment and retention outcomes have been achieved during each year of the program, participation and retention rates will be obtained from the Project Director, broken down by high-need content areas and under represented groups, and tracked over time.

Further, we will compare the retention rate of UBTR graduates with that of non-UBTR graduates in BPS. A baseline rate of attrition will be obtained from the BPS Office of HR to provide a context for the attrition rates that correspond to the required three-year service timeline. During each year of the program, attrition rates will be obtained from BPS Office of HR for beginning teachers who did not graduate from the UBTR Program and compared with the attrition rate of UBTR graduates.

Objective 3: Provide ongoing support and professional development for program participants, both residents and teacher leaders, through an innovative consortium for at least the first five years of their teaching careers..

Short-term Outcomes: The UBTR Consortium (UBTC) consisting of both in-person and virtual mentoring is created and operational.

Mid-term Outcomes:

a. Increased self-efficacy of TRs in teaching at urban schools

b. Satisfaction of MTs, SCs and TEAs and other participants with UBTC.

c. The UBTC is institutionalized at both UB and BPS.

Formative Evaluation Question: To what extent was the mentoring model implemented with fidelity? To what extent are varying levels of implementation associated with the perceived effectiveness of the mentoring program?

Design: A treatment fidelity checklist will be developed during the first summer institute and refined in subsequent summer institutes. The checklist will include mentoring activities (e.g., one-on-one conference, observation, modeling lessons, etc.), the mentoring tools utilized and time spent on them during the teacher residency year. The checklist will be completed by both the TRs and MTs monthly. The checklist will provide a rating of the level of implementation and adherence to the mentoring model. Descriptive statistics on responses to the checklist will be used to determine the degree of fidelity of mentoring implementation, and areas for improvement will be identified and implemented in subsequent years. The different levels of fidelity of implementation will also be correlated with MTs' ratings of TRs on STAR and TEAs' ratings on STEVAL.

Summative Evaluation Question 3: To what extent do UBTR graduates and teacher leaders find the three-years of mentoring support effective?

Design: Beyond the year of residency, the UBTR Program includes three years of mentoring/coaching support for beginning BPS teachers. To measure the effectiveness of the mentoring model, surveys will be administered to beginning teachers and their teacher leaders during the first three years after the teacher residence year. The UBTR survey instrument will be developed from several existing measures including the National Center for Educational Statistics School and Staffing Survey (SASS), the Santa Cruz New Teacher Center (NTC) Induction Survey, and the Teachers' Sense of Efficacy Scale (TSES) (Tschannen-Moran & Hoy, 2001). The survey will be designed to measure constructs associated with teacher attrition

including school climate, administrative support, satisfaction with their teaching assignment, as well as specific components of the NTC mentoring model and efficacy. In addition, the survey will address other types of support available to UBTR graduates including participation in UBTC and summer workshops. MTs, SCs and school administrators will also be surveyed about their experiences in the UBTC. The teacher leader survey and the UBTR Beginning Teacher Survey will share a common set of core items to allow for comparisons about the type and focus of mentoring activities across the two stakeholder groups. In an effort to obtain comparative information about the effectiveness of participation in the UBTC Program, a stratified random sample (according to subject area) of comparison first, second and third year teachers will also be included in the survey administration. In addition, the grant application requires that, if possible, support be provided to other beginning teachers in schools where UBTR graduates are placed. This stipulation in combination with the use of a comparison group affords the project a unique opportunity to assess the value of participation in the residency by comparing survey results across three groups of beginning teachers: (1) UBTR graduates; (2) non-UBTR graduates who receive support from UBTC; and (3) non-UBTR graduates who do not receive any additional support beyond the traditional district induction program.

Objective 4: Develop and support a sustainable, district serving, STEM professional development program

<u>Short-term Outcomes</u>: A comprehensive and effectiveSTEM-C PD program consisting both face-to-face and online modules is created and offered.

<u>Mid-term Outcomes</u>: TRs, MTs, SCs and hosting school administrators possess necessary knowledge, skills and attitude to integrate computational thinking into subject teaching

Formative Evaluation Question: How effective is the STEM- C PD?

Design:

In order to evaluation the effectiveness of the face-to-face teacher professional development during the summer institute and virtual online modules during the academic year, a set of survey questions will be included in the summer institute evaluation and at the end of each online module on the perceived effectiveness of training. The survey questions will address areas of content difficulty, clarity of presentation and explanation, effectiveness of teaching modeling of integration, and usefulness of resources and tools. In addition, teacher summer institute and online modules will be observed on student participation and interaction with the instructor/trainer. Select TRs, MTs, SCs and hosting school administrators will be interviewed on their perceptions of the effectiveness of the training; areas for improvement will be identified and implemented in subsequent years. Finally, at the end of each monthly PLC session, an evaluation will be conducted to assess the effectiveness of achieving the stated objectives and solicit suggestions to plan subsequent monthly PLC sessions.

Summative Evaluation Question 4: Do TRs, MTs, SCs and hosting school administrators possess necessary knowledge, skills and attitude to integrate computational thinking into subject teaching? To what extent has computation thinking been integrated into teaching of subjects?

Design:

At the end of each summer institute and online training module, a content exam will be administered to all participants. The exam will cover not only computer science principles but also pedagogical content knowledge on integrating computer science principles and commutating thinking into subject teaching. The exam questions will include both selected response questions

for computer science content knowledge and scenario-based constructed response questions for computer science pedagogical content knowledge.

During the teacher residence year, we will also include into monthly implementation log (described in Evaluation of Objective 3 above) a section of questions related to types and frequencies of integrating computer science principles and computational thinking into teaching to measure the fidelity of implementation. Both descriptive statistical and qualitative summaries will be conducted to evaluate the achievement of objective 4.

Objective 5: ***Strengthen the role of BPS school administrators in supporting novice teachers and teacher leaders.***

Short-term **Outcome: School administrators of hosting schools possess knowledge, skills and disposition in co-teaching, teacher mentoring and teacher leadership.**

Mid-term Outcome: Collaborative professionalism is created and maintained in hosting schools

Formative Evaluation Question: How effectively has the principals' training program implemented?

Design: Given the small sample size of participating school principals, we will rely mainly on qualitative data to measure the effectiveness of principal training. Interviews of principals will be conducted. These interviews will focus on participating principals' experiences in the summer institute and their perceived gains in knowledge, skills and dispositions in co-teaching, teacher mentoring and teacher leadership development. Although the sample size will be small, pre- and post- surveys will help to contextualize the findings from the interviews in terms of principals' knowledge and dispositions. The findings of these interviews and surveys will inform subsequent offerings of this particular training component.

Summative Evaluation Question 5: To what extent is a collaborative professionalism created and maintained in the participating schools?

Design: A survey of collaborative professionalism will be created using the dimensions from Hargreaves and O'Connor (2018). The survey will be conducted online and be given to all teachers including school administrators in the participating schools at the end of each school year. The collected survey responses will be disaggregated by TRs, MTs, SCs, other teachers and school administrators so that perceptions of collaborative professionalism in the school will be compared among the teacher groups.

Long-term Outcome: Increased rates of teacher retention in urban schools and improved student academic outcomes.

Overall Summative Evaluation Question 1: Has the number of learner-ready teachers in BPS increased?

Overall Summative Evaluation Question 2: How diverse is the teacher population in BPS?

Overall Summative Evaluation Question 3: Has the number of teachers who stay in the teaching profession for a minimum of 5 years increased?

Overall Summative Evaluation Question 4: Has student learning improved in BPS??

Design: From year 6, we will collect data on long-term impact on BPS teaching workforce and student learning. Specifically, for the five years (i.e., years 6-10) after the USDOE funding, teacher workforce data will be collected from BPS HR. The data will be disaggregated by key characteristics including race/ethnicity, certification area, and years staying in teaching and in BPS. In addition, we will also collect data on student achievements in UBTR participating schools. Student achievement data will be gathered from the NY State Department of Education's School Report Cards. This annual public data report each school's overall student

learning in terms of meeting state learning standards in each school subject as well as student, teacher, and school demographics.

The UBTR Program will cooperate fully with a national evaluation contractor selected b the USDOE to evaluate the program by responding to all data requests in a timely manner.

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