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Colorado Boettcher Teacher Residency – Rural Expansion

PEBC – Public Education & Business Coalition, which operates the Colorado Boettcher Teacher Residency (CBTR) program, in partnership with Adams State University (Adams State or ASU) and fifteen rural Colorado school districts, respectfully requests \$3,016,948 over five years through the Teacher Quality Partnership (TQP) Grant Program to expand and enhance their proven teacher residency program. This investment will boost student achievement in some of the most challenging rural schools in Colorado, and will provide a model for how teacher residency programs, universities and school districts work together to improve outcomes for rural public school students through teacher preparation.

The fifteen high-need Local Educational Agencies (LEAs), or qualified rural Colorado school districts, are: *San Luis Valley Area* - Alamosa RE-11J, Center 26JT, Monte Vista C-8, North Conejos RE-1J, Moffat 2, Sierra Grande R-30, Centennial R-1, Del Norte C-7, Sangre de Cristo RE-22J; *Southeast Area* - Crowley RE-1J (Ordway), East Otero R-1 (La Junta), Huerfano RE-1 (Walsenberg), Rocky Ford; and *Southwest Area* - Montezuma-Cortez RE-1 and Dolores County RE-2J. Only CBTR/ASU partner school districts eligible as high-need LEAs are participating in this project.

Located in Alamosa, in the heart of the San Luis Valley (SLV) in south-central Colorado, Adams State University was established as a teacher's college in 1921 to serve the educational needs of this 8,000 sq. mile rural region, the population (46,027 residents) of which is 46% Hispanic (2010 US Census). ASU currently offers 22 bachelor's, 9 master's degree programs, and a doctoral program. In 2000 ASU became the first 4-year institution in Colorado designated as a Hispanic-Serving Institution. ASU's undergraduate campus population of 2,167 students is 31.2% Hispanic and 14.8% other ethnic minorities (Fall 2013 data). The vast majority of

students (86%) are residents of Colorado, and 54% are eligible for low-income based federal Pell grants. Since 2003, ASU has had a statutory role as the Regional Education Provider for 14 counties in southern Colorado and significant responsibility to assess the educational needs of the rural region and provide access to teacher education. ASU's Teacher Education Department (TED) provides teacher preparation programs for licensure (elementary, secondary, K-12, Masters Plus). In Spring 2013 there were 25 TED master's graduates.

CBTR has been approved by the Colorado Department of Education as a Designated Agency for alternative licensing, and only recruits individuals that are deemed highly qualified. PEBC/CBTR have an existing partnership with Adams State University which includes the college of Arts & Sciences and the Teacher Education Department. Both PEBC & CBTR have committed to increase the supply and retain excellent STEM teachers as partners in the 100Kin10 movement. CBTR/ASU have complied with all necessary criteria related to the State Report Card under Section 205(b) of the Higher Education Act Title II.

This partnership (hereinafter referred to as CBTR/ASU) prepares new teachers for high-needs school districts. This effort represents a major institutional commitment by all the partners aimed at significantly improving the recruitment, selection, preparation and retention of highly-qualified Resident Teachers to impact student growth and achievement. The partnership will accomplish its goals through innovations in recruitment (with an emphasis on recruiting more underrepresented groups, especially in high need subjects like math and science), and rigorous preparation, both of which contribute to the retention of highly-qualified Resident Teachers.

CBTR/ASU will address the following TQP priorities:

Absolute Priority 2: Partnership Grants for the Establishment of Effective Teaching Residency Programs.

Competitive Preference Priority 1: Promoting Science, Technology, Engineering and Mathematics (STEM) Education.

CBTR/ASU is an established, unique and cost-efficient teacher residency model that produces highly-qualified teachers focused on improving the academic achievement of students. It is based on sound operational practices and research, integrating rigorous graduate-level coursework with hands-on classroom practice for the Resident under the guidance of a skilled Mentor. Its most unique characteristic is the level of professional development provided to a prospective Mentor Teacher (Mentor) during the planning year to ensure strong coaching skills from the first day the Resident Teacher (Resident) arrives. Residents are placed into collaborative cohorts to facilitate shared learning, and receive up to four years of induction support in alignment with their five-year service agreement. Over the past ten years, CBTR has graduated over 175 Master's degree teachers, more than 90% of whom have remained in teaching or education leadership five years after they started the program. CBTR/ASU is designed to improve student growth and achievement for Colorado's most vulnerable students.

Through this grant CBTR/ASU will further improve student achievement in Colorado by **expanding** the number of well-qualified and diverse teachers this program can provide to these rural school districts (including STEM teachers), and by **enhancing** the residency program to better prepare teachers for their challenging work in high-needs schools. Therefore, this project has five key goals tied to TQP priorities:

Goal 1: Expand number of CBTR/ASU graduates to serve in high-needs rural Colorado schools.

Goal 2: Expand recruiting to attract more highly-qualified and diverse residency candidates.

Goal 3: Expand recruiting to attract more STEM-oriented residency candidates for high-need subject areas such as math and science

Goal 4: Create coursework around STEM content knowledge and best-practice pedagogy for training Residents and Mentors, especially those teaching in elementary grades.

Goal 5: Use student growth and achievement data, and train Residents in assessment literacy, to build teacher effectiveness and enhance teacher preparation

A. SIGNIFICANCE

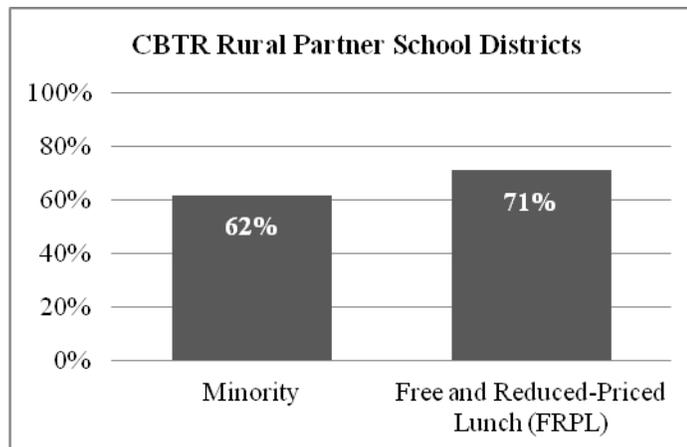
NEEDS ASSESSMENT

Needs of Rural School Districts – Students & Teachers

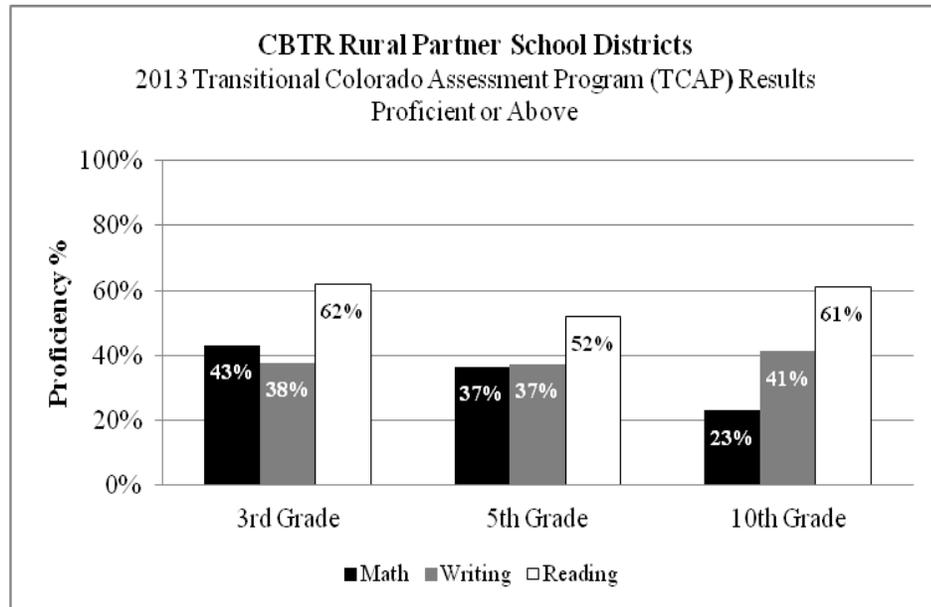
Rural school districts urgently need more well-qualified and well-prepared teachers to close the persistent student achievement gap in their high-poverty schools. Districts need a way to build local capacity for recruiting, training and retaining highly-qualified new teachers.

Districts also need support to develop Professional Learning Communities (PLCs) to analyze and use data to continuously improve learning for all students.

Students: The level of persistent poverty in these southern Colorado rural schools is staggering, with over 71% of students eligible for Free and Reduced-Price Lunch (FRPL).



The targeted rural school districts serve more than 11,800 students, 834 teachers, and 54 schools. Low academic achievement at these schools is a constant challenge as evidenced by the latest state assessment data (TCAP) culled from the Colorado Department of Education website.



While there are many factors influencing student achievement, one recurring theme is clear: i) teachers are not sufficiently prepared to meet the unique challenges of working with high-poverty students, and (ii) new teachers don't receive the induction support necessary to keep them learning and thriving in the teaching profession.

Teachers: Rural partner school districts struggle to find well-prepared new teachers to work in chronically high-poverty schools. CBTR chose to partner with Adams State University to address this need. This partnership has been critical to the initial success of creating a rural residency as Adams State is a fully-integrated community member, and aids in bridging the cultural divide between the school districts, CBTR and prospective Residents. Geographic clustering was also an important factor since one of the most enduring elements of the program is creating a collaborative cohort of peers who can attend classes together in order to learn and

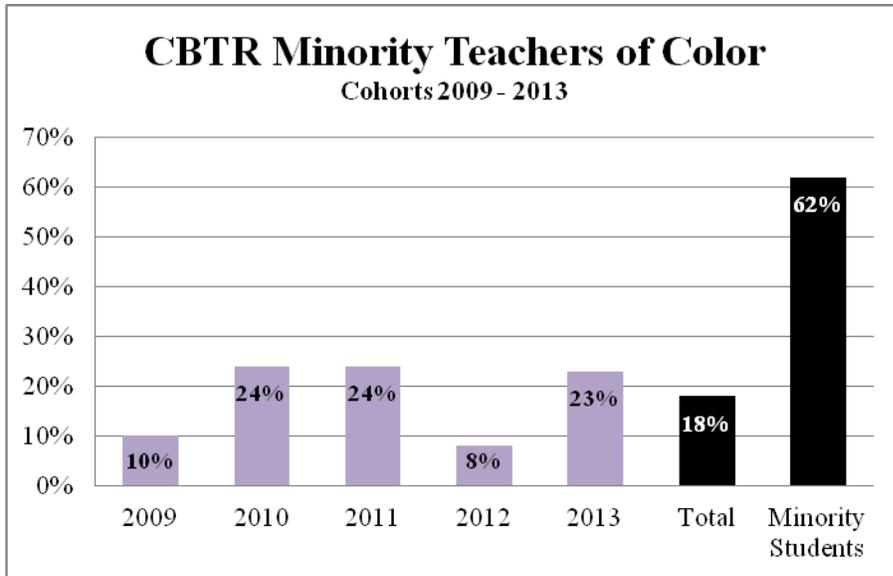
grow from one another as professional colleagues. Therefore school districts with close proximity to one another were chosen for cohort purposes.

This approach enhances the probability that this program will both build **local capacity** to address the needs of rural community members, and result in substantive **system change and improvement** as it is working up-front and collaboratively with public school administrators to understand their specific **personnel and instructional shortages**, especially in high-need STEM subject areas like secondary math and science.

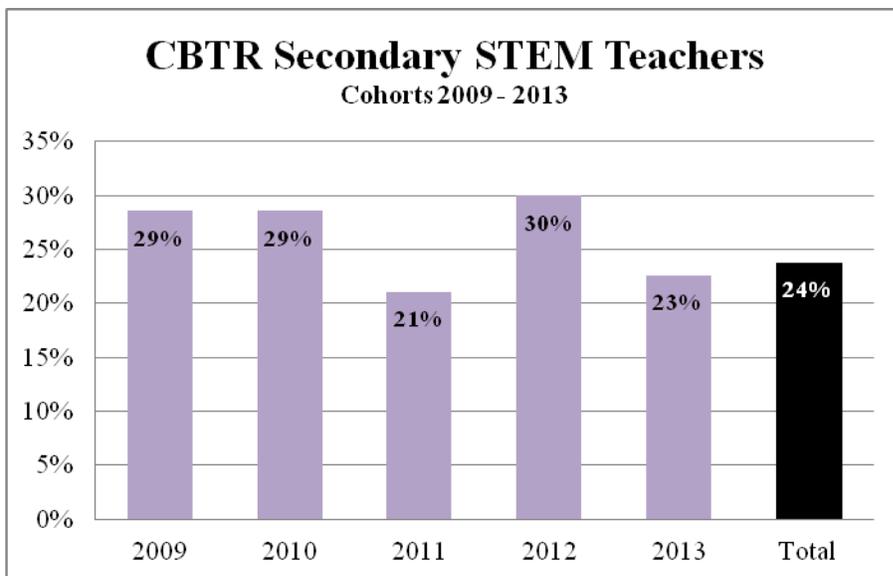
CBTR/ASU works closely with districts to understand their projected new teacher needs. Most of these districts have an average teacher turnover rate greater than 15.5%, or > 1.4% of teachers are on waivers of State certification requirements. CBTR also projects numbers based on its experience; for example, there is always more need for secondary math or science teachers than there is for social studies based on requests from school principals. CBTR/ASU ties recruitment and selection to these projections. This past year CBTR extended its authorized content areas to better meet the needs of partner districts (e.g. Physical Ed., Music, Spanish).

Needs of Colorado Boettcher Teacher Residency & Adams State University

Recruiting Diverse Candidates & STEM Candidates - The need for recruiting highly-qualified and diverse candidates from underrepresented populations remains a focus of the Residency's recruiting efforts. For rural areas it is taking a more "grow your own" approach as it is extremely challenging to attract candidates to move to these areas. Teachers more representative of the student body, who grew up in the same area, or similar rural area, can understand students better and help them to navigate the cultural divide. Since 2003, the Residency program has graduated 18% Residents of Color, when the students in the rural partner districts are 61% minority (see chart below), and 29% Spanish-speaking.



Additionally, CBTR/ASU struggles, like many other residency programs, to find enough qualified math and science candidates, especially willing to relocate to rural communities. With funding, recruitment and admissions processes will be strengthened to improve the pool of candidates for high-need subject areas. Additionally, a more robust curriculum element will be developed in STEM content knowledge and pedagogy for elementary teachers, as their importance in setting the stage for STEM success is critical.



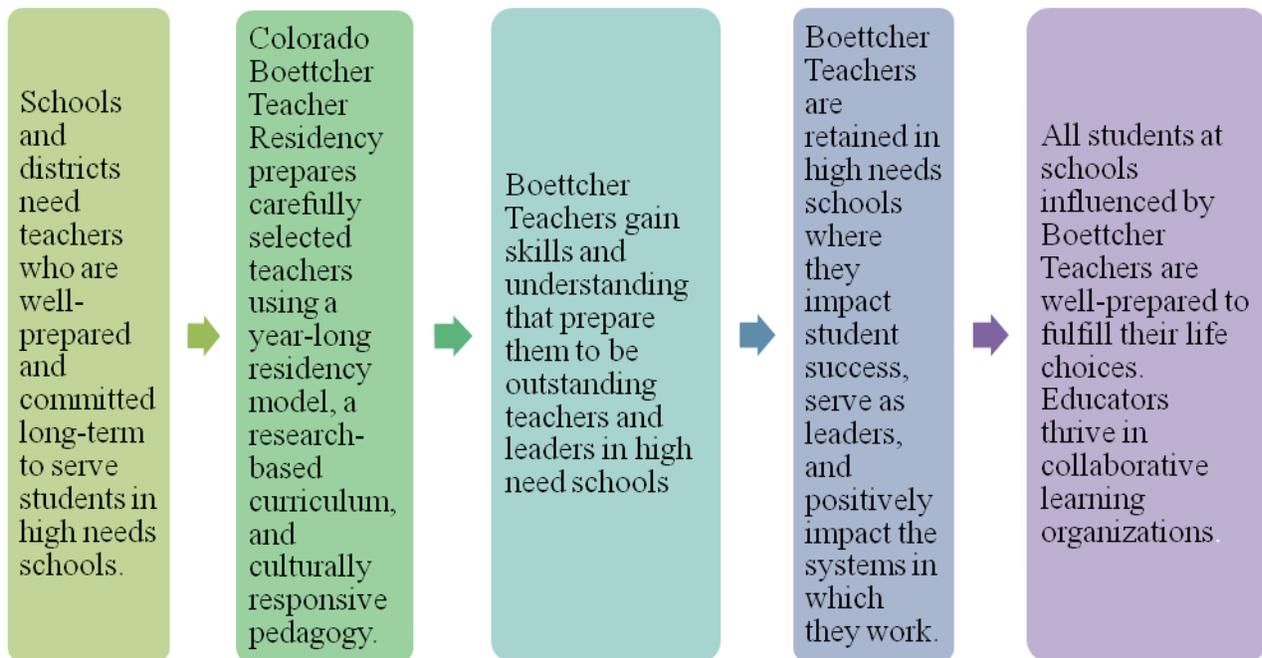
Need for Improved Data Usage and Assessment Literacy - The Residency needs to enhance and refine its overall effectiveness to ensure success as the program expands. Through this additional funding a much stronger evaluation feedback loop will be possible, linking teacher preparation and instructional practice with student growth and achievement. While there has been great success due to careful program design and strong recruitment, work is still needed to strengthen the causal relationship between teacher preparation and induction support with student growth and achievement data. CBTR currently tracks select quantitative and qualitative data on its numerous measures around teacher practice which is utilized by Field Directors, Mentors, and Residents to provide feedback. This needs more alignment to coursework and practical approaches demonstrated by Mentors in the classroom.

Other Current Teacher Preparation and Professional Development Activities – Since CBTR is part of PEBC, a professional development organization, Residents receive strong induction support funded by various sources. As a member of Urban Teacher Residency United (UTRU), CBTR works and collaborates with other residency programs in discussing best practices and lessons learned. Over the past ten years, CBTR has learned many lessons including: (i) the need to provide robust professional development support during a Planning Year to better prepare Mentors for guiding and coaching Residents adequately, (ii) the need for school leadership’s commitment to create a collaborative learning culture focused on continuous improvement, (iii) the need to cluster Residents together in schools whenever possible, (iv) the need to work with a university partner to develop a theory-to-practice integrated curriculum designed specifically for residency-based teacher preparation, and (v) the integration of assessment and data literacy into the residency curriculum and post-Residency induction support.

B. Project Design

The Colorado Boettcher Teacher Residency is firmly established, however there is a strong need to expand and enhance the rural residency program, which is only possible through this funding. Described below is data supporting this approach, how the CBTR/ASU partnership currently operates the program, and how it will be grown and enhanced to further impact student success.

Logic Model and Theory of Action - CBTR/ASU's logic model is based on the belief that high-quality teacher residency programs can empower teachers with the skills and strategies to create and maintain culturally responsive, safe spaces in high needs classrooms and schools. It creates cohorts of professional teachers who are committed long-term to service and leadership in the delivery of quality, equitable education. The Theory of Action appears below:



CBTR has gathered evidence since its inception of how its theory of action has led to successful outcomes. Outside evaluations have shown that CBTR Teachers are more effective than other teachers of comparable experience levels on some measures. The most recent evaluation report indicated that on state achievement data, namely the TCAP Reading and Writing assessments, students of CBTR Resident Teachers showed significantly higher levels of growth than students of comparison teachers with a similar level of classroom experience. On TCAP Math, students of CBTR Resident Teachers had higher median growth (47th percentile) as compared to students of non-CBTR Resident Teachers (43rd percentile). There was a significant relationship between CBTR Resident Teachers and students' overall proficiency levels. Higher performance levels were associated with CBTR Resident Teachers in TCAP Reading, Writing, and Math. For individual teachers, these analyses show a relationship between CBTR's preparation and ongoing training, and both student academic growth and proficiency. ("Boettcher Teachers Program: Student achievement results for 2011-12" report compiled by Connors, S., Presley, J., and Walters, B. (2013), Univ. of Colo. Denver: The Evaluation Center Schools of Education and Human Development).

Theory, Research & Practice As Basis for Project – CBTR takes an asset-based, systems approach to elevating student achievement by training not only individual teachers, but also departments, teams, entire schools and districts. PEBC and CBTR's logic model is based on teachers receiving instruction and coaching in the authentic application of the following research-based practices: (i) planning for understanding; (ii) building a community of learners; (iii) implementing Workshop Model instruction; (iv) cultivating learners' independence by gradually releasing responsibility for learning; (v) applying Thinking Strategies across content to deepen understanding; (vi) engaging students in classroom discourse that cultivates

understanding; and (vii) using multiple data sources to assess learning, including student self-assessment.

Research has shown that teachers need both content knowledge and pedagogy to be effective classroom teachers (Ball, Thames & Phelps, 2008), and that well-qualified teachers with strong pedagogical skills can close the achievement gap for at-risk students (Haycock, 2001; Education Trust (1998); National Commission on Teaching and America's Future (NCTAF, 1996)). Other research underlying this approach is the work demonstrating the value of Professional Learning Communities (PLCs) in improving teacher learning and raising student achievement (DuFour, Eaker & DuFour, 2008).

Using Research & Data to Modify Instruction - Teachers, as professionals, must be able to use the analytical tools of educational research in order to make sense of, critique, and apply results of published research as well as to conduct inquiry into one's own practice. Throughout the program, Residents develop the dispositions of researchers and explore the role that research, inquiry, and reflection play in shaping understanding of teaching practice. Residents explore the many possibilities for what "counts" as data, and how data can be used effectively and richly to inform instructional decision-making.

Integration of Funding Sources - CBTR has received commitments of over \$15 million to support its Residency program since its inception. This funding helps pay for organizational administration, residency training and induction expenses, and mentor training expenses. Participating school districts are asked to contribute towards the program and do so based on their ability to pay.

Intended Use of Grant Funds - Grant funding will be used as detailed in the budget and budget narrative to expand and enhance the CBTR/ASU program to provide more well-trained

teachers for Colorado's rural school districts. The need for supporting this program is compelling, since CBTR is the only residency program working in rural Colorado.

Commitment of Resources & Sustainability - CBTR and ASU have committed significant financial resources to this effort including staff time and faculty participation. In creating an exclusive IHE partnership with ASU for both the urban and rural cohorts, master's degree candidates have grown from 30 this past year to over 60 this year. This increased enrollment creates revenue aiding in the expansion and improvements, and creates a more stable revenue source. This creates a significant institutional shift for Adams State that will allow sustainability over the longer term. CBTR/ASU has developed a five-year financial model and operational plan, and has commitments from all partners and school districts to implement the project.

ESTABLISHMENT & DESIGN

In partnership with the Boettcher Foundation, PEBC founded the Colorado Boettcher Teacher Residency (CBTR) in 2003 to make a lasting impact on student achievement in high-needs schools in Colorado. The Residency offers each candidate a year-long classroom apprenticeship with a highly-effective Mentor Teacher, culminating in the awarding of a Colorado Teacher's license and a Master's degree in Education, with an endorsement for working with culturally and linguistically diverse learners. During their five-year service agreement, Residents receive extensive induction support through a variety of professional development offerings. Since CBTR is an established residency program, the current approach and capacity to train teachers is summarized here and detailed below.

Adams State University is CBTR's higher education partner and is located in rural Alamosa, Colorado. CBTR partnered with Adams State to launch its first rural residency cohort in the San Luis Valley (SLV or Valley) this past school year, placing 10 Residents in three SLV

school districts. The rural residency cohort is expanding to 23 Residents for the 2014/15 school year. PEBC is applying for this grant to support further expansion into both current and new rural partner districts that have historically struggled to recruit and retain new teachers. The Residency does not currently train special education or early childhood teachers, but is considering adding both of these disciplines in the next few years.

Since its inception, CBTR has graduated over 175 teachers, 96% of them have remained teaching in high-need partner school districts through their five-year service agreement, and 90% continue in education today. The rural element of the CBTR program currently has the capacity to train about 25 Residents each year, with the ability to scale up to 50 per year with additional funding. If funded, CBTR/ASU will graduate 195 new teachers for the partner school districts by Year 5, serving over 10,000 students annually in some of the neediest areas of Colorado.

Residents are provided foundational skills through an intensive Summer Institute over several weeks before the school year begins. Once school starts, Residents work Monday through Thursday in a classroom co-teaching alongside their Mentor. A “gradual release model” allows them to take on a greater role as the year progresses. Residents attend weekly seminars as part of a collaborative cohort of learners; seminar coursework is grounded in CBTR’s seven curriculum strands (Classroom Environment/Management, Facilitating Student Understanding, Standards & Assessment, Teaching/Learning/Planning Cycle, Contemplative Practice and Wellness, Reflective & Responsive Practice, and Professionalism) for teacher development and helps Residents to make in-depth connections between theory and practice. During the year they are observed and coached by CBTR Field Directors as well as their Mentor. Mentors also benefit from this process, and have said that by taking on this training role their career has been rejuvenated.

The seven elements listed below clearly demonstrate that the CBTR/ASU program provides the high quality, duration and intensity needed to lead to improvement in teacher practice, and that it is a coherent and sustained approach to training.

(1) *Integrating Pedagogy, Classroom Practice & Mentoring* - The foundation for this project is CBTR's proven residency program that has already served as a model for others. The 12-month teacher residency integrates pedagogy, classroom practice and guided mentoring into a rigorous cohort-based graduate program, leading to a Master's degree. Residents simultaneously engage in theoretical study and experiential learning in the classroom with real students and with real dilemmas of practice. To ensure their continued success Residents are supported by a two year induction program, with two additional years as needed, that includes instructional coaching, professional development courses and institutes, and participation in PLCs. Residents commit to teaching in high-need partner schools for an additional four years after graduating.

(2) *Rigorous Graduate-Level Coursework* – University-based coursework is designed to provide theoretical foundations, research, and conceptual frameworks around teacher preparation, and is based on Colorado Teacher Quality and Performance-Based Standards. ASU faculty and CBTR adjunct faculty collaborate deeply with one another in the design and delivery of the residency curriculum, all of which is aligned to the Colorado Academic Standards (which incorporates the Common Core State Standards). Residents analyze their practice in light of theory and research by integrating coursework and field work with an intentional overlap of coursework to increase program coherence. This provides each individual with an opportunity for reflection and growth. Courses start in the summer before their Residency year begins, and lead toward a Master's degree, typically over a 24-month period (a Master's degree can be obtained within an 18-month period utilizing the full complement of online and summer

courses). In addition to extensive literature-based research throughout the program, Residents work with faculty and administrators in their PLC to identify questions, challenges and practices in their classrooms for exploration. With support from faculty, Residents formulate inquiry questions, review literature and develop tools to engage in action research. All the while they'll be doing hands-on teaching apprenticeship in a K-12 classroom guided by an experienced mentor.

Assignments and assessments in all courses allow participants to engage in meaningful projects and “assessment events” and create useful products that help develop the skills and dispositions of competent, inquiring teachers. Residents develop a Teacher Work Sample (TWS) portfolio during their residency which is a collection of exemplars of the “real work” of a teacher, including video clips and related classroom artifacts. The TWS addresses the question, what should a teacher know and be able to do, and demonstrates the synthesis of a Resident’s thinking, planning, instruction, assessment, and reflection on teaching and learning. It attempts to address all aspects of the life of a teacher with an emphasis on deep knowledge of students and the interconnectedness of curriculum design, instruction, and assessment in order to foster student learning.

(3)Experience & Learning Opportunities Alongside a Mentor – The critical role of the Mentor cannot be understated. A trained and experienced Mentor provides the hands-on learning opportunities for the Resident, which is tightly aligned with the graduate-level coursework. Mentors act as a teacher leader and aid in facilitating a PLC encouraging all teachers to be learners so as to continually improve their capacity to learn themselves, and to help their students advance their learning. CBTR puts a great deal of emphasis and energy into the pairing process of Mentors and Residents, since experience has shown that this is a critical element of success.

CBTR has a comprehensive and intentional focus on setting the conditions for success with Residents during a Planning Year, prior to the Residency Year. During the Planning Year CBTR engages deeply with the principal, school leaders, Mentors and other teachers with widespread professional development support that is leveraged for all the educators in the school building. It is important before new teachers enter these classrooms that the teachers around them have a unified vision of strong instruction, and that school leaders are dedicated to creating a vibrant learning environment. Potential Mentors are identified and receive job-embedded instructional coaching, developing them further as a teacher and as a Mentor. All educators in the building, or in the case of smaller districts, within the district or Board of Cooperative Educational Services (BOCES), are invited to participate in Workshops and/or PLCs to leverage the professional development being provided. These interconnected efforts are critical to building the long-term local capacity of the school and district leading to system improvement. When identifying partner districts, CBTR is careful to explain its holistic method of training and supporting teachers, to ensure that partners are willing to embrace this approach.

Recent experiences in the San Luis Valley have verified the benefits of this approach. In addition to the Mentors working directly with Residents, other teachers trained are collaborating with the Field Directors to participate in learning panels and school-based PLCs to provide additional Residency support, and continually improve their capacity to advance student learning. In many instances Mentors are given extra responsibilities as teacher leaders or coaches within the school.

(4)Mentor Selection Criteria – The most effective Mentors share common dispositions including: openness to sharing and articulating their professional practice, demonstrated history of exemplary teaching skills using research-based best practices, belief that all children can

learn, and strong collaboration and coaching skills. Selecting and training Mentors is an elaborate process. Basic minimum qualifications necessary for a potential Mentor include three years of teaching experience, and teaching at least two class periods with traditionally lower performing students. Initially, university faculty and school leadership are engaged to find out who they would recommend, as well as a self-nomination process is used. As these are small communities, it is well known who the likely Mentor candidates are. However, not all great teachers make great Mentors, so there is then a formal interview process where CBTR considers: measures of teacher effectiveness; content knowledge and pedagogical skills; planning and preparation; assessment (formative and diagnostic for improved student learning); differentiated learning instruction; collaborating with colleagues around instruction; analysis of gains in student learning using multiple measures; strong skills around reading and math instruction, and literacy instructional strategies across core subject areas.

Training for Mentors includes an Effective Mentoring Institute where they learn cognitive coaching skills, and a Math Institute focusing on inquiry, thinking strategies and discourse. Literacy training is grounded in the professional development experience of PEBC. Institutes and instructional coaching demystify the reading process and illustrates the connected nature of the Surface and Deep Structure Systems that are foundational in helping readers access text and comprehend deeply.

(5) Cohort Collaboration – To better facilitate professional collaboration, incoming classes of Residents are grouped together as part of a cohort to advance their own learning. During their Friday Seminar class they come together, getting to know one another well. They develop a set of shared experiences that becomes part of the group's identity, and can be touchstones across the curriculum. Residents move through the first year of the program as a

cohort, take most of their classes together, engage in collaborative learning experiences such as retreats and field experiences in the community, and support and challenge each other's learning and assumptions. The cohort's small size (approx. 25-30) fosters the creation of strong relationships and of individualized, personalized attention to learning.

Professional learning groups have also been demonstrated to be highly effective in enhancing teacher satisfaction and growth. The PLC movement has taught educators that "a collection of superstar teachers working in isolation cannot produce the same results as interdependent colleagues who share and develop professional practices together," (Garmston & Welman, 1999, p.18).

Mentors also participate with the cohort, engaging in collaborative, reflective learning together while assisting the learning of Residents. Residents and Mentors working on the same school-based teaching teams also have additional opportunities to work and grow in PLCs.

(6)Admissions Goals and Priorities – CBTR/ASU and the school districts work collectively to determine the hiring needs and goals for the coming year, and coordinate Residency admissions accordingly. This ensures the high probability that such Residents will be hired by a partner LEA following their training (since 2003 over 97% of graduates have been hired by partner districts). This may include addressing demographic disparities to better reflect the community or underrepresented population in the teaching profession.

(7)Induction, Professional Development & Networking – Based on its record, CBTR's projected goal is that 90% of newly placed CBTR Teachers will remain teaching for at least five years. All of this training and support encourages teachers to remain in their placements. Research shows that comprehensive, high-quality teacher professional development can accelerate professional growth and teacher effectiveness, reduce teacher turnover, and ultimately

lead to improved student learning and achievement. (Glazerman et al., 2012; Taylor & Tyler, 2012).

CBTR Teachers receive two intensive years of induction support following their Residency year (Years 2 and 3), and more induction support in Years 4 and 5 as needed. The support includes best practice instruction; observation, feedback and evaluation on instructional practice; and the development of skills needed to meet the Teacher Quality Standards. Additional PEBC-led collaborative seminars and lab classroom visits provide opportunities for CBTR Teachers to observe high-quality instruction and reflect on ways to incorporate these into their own practice. They also continue to participate in PLCs.

Post-Residency activities will expand to include a New Teacher Learning Series (3-hour evening sessions), covering topics like: Parent Engagement: Build a strong student-parent-teacher relationship to ensure student success; New School Year Preparation: Learn classroom management, rituals and routines, getting to know your students and other essential elements of kicking off the new school year; Assessment Literacy and Data-Driven Instruction: How to evaluate student assessment data to plan for instruction that meets the needs of each student; and Intentional Planning to Support the Educator & Student: Complete an annual plan that incorporates new academic standards which have been cross-referenced with district planning and pacing guides. A new pathways curriculum will be designed for teachers in Years 4 and 5 to ensure that teachers are provided opportunities to grow into Mentors and teacher leaders.

PEBC has provided professional development to K-12 educators for over thirty years. It takes a comprehensive and unified approach to professional learning for educators, working with practicing teachers within and across grades and subjects, along with principals and school leadership teams, to create systemic and sustainable cultures of learning. By working holistically

within schools, PEBC's professional learning work allows Residents to enter schools that have shared values around learning that mirror their training, while also ensuring a pipeline of effective Mentors for future Residents.

CBTR plans to recruit and prepare Residency candidates in years 4 and 5 of this grant, and will continue to provide the required minimum two-years of induction support beyond the life of the grant as it currently does for its graduates.

RESIDENT RECRUITMENT & SELECTION

Resident Recruitment - Solid recruitment and selection are essential elements to creating and retaining highly-effective teachers. Recruitment is primarily done through online job postings, print and radio advertising, email referral campaigns, social media campaigns, and an intensive grassroots outreach campaign through existing relationships with community leaders and higher education institutions. Candidates fall into three categories: recent college graduates, young professionals, and more experienced career changers. Traditionally underrepresented populations (rural residents, minorities, low income) will also be recruited in innovative ways, including current Adams State undergraduates, and from neighboring states. Collaborations and referrals have been successful with City Year, Peace Corps, Teach for America and Urban Teacher Residency United (UTRU). CBTR has also been focused on "grow your own" efforts, knowing that candidates with roots in the communities where they teach are better able to serve students, and are more likely to stay.

The recruiting window opens in August. Applicants concurrently complete an application for alternative licensure through the Colorado Department of Education, a CBTR program application, and a graduate school application to Adams State. CBTR has an extensive screening process which includes GPA, content knowledge, passing of the PRAXIS exam, and

rigorous one-on-one and group interviews. Since CBTR asks for a five year commitment up-front, 100% of selected applicants intend to enter the field of teaching, and have passed all applicable State qualification assessments for new teachers, including as assessment of their subject matter knowledge in the content area in which they intend to teach. Successful candidates have a long-term commitment to Colorado; a passion to work with youth in need; and a strong belief that improving public education is essential for social equality. From January to April multiple perspectives are considered, as candidates participate in site visits at schools, interview with Principals, and observe and interview Mentors. Applicants are notified of their acceptance on a rolling basis which is finalized in May, and training begins in July with a Summer Institute. CBTR is placing 23 highly-qualified CBTR Teachers in select rural districts during the coming 2014/15 academic year.

During the upcoming 2014/15 academic year, grant funds will be used for expenses related to recruiting, selecting and placing candidates in the various school districts for the following year. Additionally, funds will be used to create the conditions for success related to Residents' training and retention, including professional development and support of Mentors, school leaders, and the other teachers in the school that Residents will encounter as they begin teaching. Grant funds will be 100% matched with either an in-kind contribution from PEBC/CBTR, Adams State, or a gift from the Colorado-based Boettcher Foundation.

Resident Selection Criteria - Eligible applicants are recent graduates of a four-year institution of higher education, or a mid-career professional from outside the field of education, possessing strong content knowledge or a record of professional accomplishment. They must possess strong verbal and written communication skills as demonstrated through their application, performance assessments, and the various elements of the interview process. In

addition, there are core dispositions that are linked to effective teaching such as self-reflection and openness to feedback that are determined throughout the selection process. Each Resident needs to meet high academic standards (eg. GPA, PRAXIS), demonstrate a record of success through professional accomplishments, have a willingness to participate in the Residency's intensive clinical experience, and the desire to become a highly-qualified teacher. CBTR/ASU complies with UTRU's national residency standards.

The Resident rubric informs the selection of potential candidates, and the LEAs participate in selection of candidates for the program. The characteristics of successful teachers are captured in Colorado's Teacher Quality Standards, which reflect research correlating professional attitudes, dispositions and practices with student achievement. In order to ensure that CBTR Teachers meet Colorado's Teacher Quality Standards, the Program has adopted the Colorado Model State Rubric as its Resident assessment tool, strengthening elements related to CBTR's focus on reflective practice and culturally responsive pedagogy, both of which are critical to the success of teachers in a high-needs context.

As discussed earlier, CBTR conducts multiple interviews to explore candidates' interest in teaching as a profession, and their core dispositions are considered, including openness, curiosity, flexibility and self-reflectiveness. Residents must have strong content knowledge, and exhibit many of the personal and professional qualities in the rubric. CBTR also selects candidates committed to the classroom, and requires a five-year service agreement. CBTR has also intentionally shaped the curriculum, classroom experiences and Post-Residency supports to increase mastery and competency on the standards, with a particular focus on instructional practices, use of assessments, and the creation of culturally-responsive, safe and organized classrooms. Resident matching with the most ideal Mentor is also key to a successful placement.

RESIDENT STIPENDS, APPLICATION, AGREEMENT & REPAYMENT

Living Stipends, Service Agreement & Tuition Scholarships - Admitted Residents sign a Service Agreement which provides them with a living stipend of [REDACTED] from CBTR. Residents make a clear, binding and contractual commitment to teach for five years (includes the Residency year) in a partner school district. Residents are responsible for all costs and expenses of ASU's Master's Degree, including but not limited to tuition, fees and books. Residents are also responsible for securing financial aid. ASU currently offers a tuition break of approximately [REDACTED] for all CBTR candidates, and a [REDACTED] scholarship credit, and is committed to maintaining this for the duration of the grant.

Repayment - If a Resident does not complete their five year commitment, a pro-rata portion of their program and university scholarship amounts must be paid back. The repayment schedule is as follows: 100% if leaving in Years 1 or 2, declining to 50% after Year 3, and 25% after Year 4. A referral may be requested based on grounds of health, incapacitation, inability to secure employment in a partner LEA, or being called to active duty in the Armed Forces of the United States, or other extraordinary circumstances. Any repayments received will be put back in the program and used to carry out activities consistent with the purposes of the Residency.

Proposed Expansion and Enhancements

CBTR/ASU propose significant expansion and enhancements of its model to meet the demands for better prepared teachers to improve student growth and achievement. This model has been successful in the existing partner districts, and through the TQP grant, the program seeks to grow and refine this valuable model into additional high-need rural districts. The following outlines the five project goals and objectives. Each goal is clearly linked to Absolute Priority 2, or the Competitive Preference Priority 1.

	TQP Priority	CBTR/ASU Partnership Goal	Anticipated Outcomes with TQP Support
EXPAND	Absolute Priority 2: Partnership Grants for Teacher Residency	GOAL 1 Expand number of CBTR/ASU graduates to serve rural schools	Increase pipeline to graduate at least 50 teachers each year
EXPAND	Absolute Priority 2: Partnership Grants for Teacher Residency	GOAL 2 Expand recruiting to attract more highly-qualified and diverse candidates	Scale to annual applications of at least 500, with acceptance rate no higher than 20%, diverse minority candidates from 18% to 25%.
EXPAND	Competitive Preference Priority 1: STEM	GOAL 3 Expand recruiting to attract more STEM-oriented residency candidates for high-need subject areas such as math and science.	Increase number of secondary math and science graduates from 24% to 30% new teachers per year over five years.
ENHANCE	Competitive Preference Priority 1: STEM	GOAL 4 Create coursework around best-practice STEM content knowledge and pedagogy to train all new teachers, including elementary.	Create new STEM content coursework for elementary teachers in math and science
ENHANCE	Absolute Priority 2: Partnership Grants for Teacher Residency	GOAL 5 Use student growth and achievement data, and train Residents in assessment literacy, to build teacher effectiveness and enhance teacher preparation.	Residents participate in collecting, sharing and analyzing student achievement data.

Absolute Priority 2: Partnership Grants for the Establishment of Effective Teaching Residency Programs

CBTR/ASU project goals #1 and #2 are designed to achieve Absolute Priority 2.

Goal 1 – Expand number of CBTR/ASU Resident Teacher graduates.

Objective A: Increase capacity of residency program to increase the number of rural graduates from 23 to 51 new teachers per year.

Goal 2 – Expand recruiting to attract more highly-qualified and diverse candidates.

Objective A: Increase diversity of applicant pool through marketing and recruitment to expand percentage of minority candidates from 18% to 25%.

Objective B: Increase quantity of highly-qualified applicant pool through marketing and recruitment to maintain current application admissions rate of 20% or lower.

TQP grant funding will allow CBTR/ASU to build upon existing expertise to establish a growth model to increase number of new Residents. The measureable goal for placement of new teachers for the 2014/15 academic year in these partner school districts will be 23 rural Residents, growing to 51 in five years, for a total of 195 new residency-trained rural teachers.

Recruitment efforts will need to be intensified to both attract and retain more teachers. CBTR/ASU has been very successful in focusing on who is admitted to the program with a strong emphasis on core dispositions related to success. Retention rates exceed 90% after five years in the program. To achieve Goals 1 and 2, CBTR/ASU will invest in more aggressive outreach and marketing to generate more leads, including more diverse candidates. It will also invest more in public relations that is needed to reach a wider and more diverse audience.

Coverage will be focused on unpaid media placements including press releases, editorials, byline

articles, conference presentations, and additional speaking opportunities. (See table below for increments year to year.)

Projected Number of CBTR-Trained Rural Residents:

School District	2014/15	2015/16	2016/17	2017/18	2018/19
Alamosa RE-11J	█	█	█	█	█
North Conejos RE-1J	█	█	█	█	█
Monte Vista C-8	█	█	█	█	█
Center 26JT	█	█	█	█	█
Moffat 2	█	█	█	█	█
Sierra Grande R-30	█	█	█	█	█
Centennial R-1	█	█	█	█	█
Del Norte C-7	█	█	█	█	█
Sangre de Cristo RE-22J	█	█	█	█	█
Crowley RE-1J	█	█	█	█	█
East Otero R-1	█	█	█	█	█
Huerfano RE-1	█	█	█	█	█
Rocky Ford	█	█	█	█	█
Montezuma-Cortez RE-1	█	█	█	█	█
Dolores RE-2J	█	█	█	█	█
Total	23	31	41	49	51

CBTR/ASU is projecting that 57% will be elementary, and 43% will be secondary (of which 30% will teach math or science). At the end of the five year grant period, the number of students taught annually by these new teachers is projected to be 8,385 (30/elementary and 60/secondary).

CBTR/ASU project goal #5 is designed to achieve Absolute Priority 2.

Goal 5: Use student growth and achievement data, and train Residents in assessment literacy, to build teacher effectiveness and enhance teacher preparation

Objective A: Residents participate in collecting, sharing and analyzing student achievement data.

Objective B: Teacher preparation curriculum incorporates assessment literacy elements.

The Residency needs to create tighter linkages between student outcomes and teaching effectiveness. Currently, mostly summative assessments such as TCAP scores and teacher

retention are used to analyze program effectiveness. In Year 2 new tools will be introduced to create a more continuous feedback loop between student achievement, teacher attitudes, behavior, planning, and induction support.

In Colorado, the state model system for teacher evaluation requires that 50% of a teacher's evaluation be based on student achievement. As a result, it is imperative for teacher preparation programs to effectively train teacher candidates in assessment and data literacy. CBTR/ASU will develop a new curriculum element to build the assessment literacy capacity of Residents, including: (i) integration of Norman Webb's Depth of Knowledge (DOK) in their instructional practice and daily assessment of students; (ii) application of skills in assessing student work by drawing on DOK foundation and utilizing rubrics to identify level of performance, complexity, and rigor embodied by student work, (iii) identification and selection of quality assessments for use in the evaluation of their students, (iv) develop performance assessments, and (v) develop unit plans with embedded assessments, as a culminating time to tie together all of the knowledge and skills developed in prior years. Residents will develop capacity to evaluate the alignment, quality, rigor and complexity of assessments used for evaluating their students' knowledge and skills. In addition, residents will learn additional techniques for collecting, tracking, and analyzing student assessments and student work in order to improve differentiated instructional strategies to impact student learning.

Competitive Preference Priority 1: Promoting Science, Technology, Engineering and Mathematics (STEM) Education

CBTR/ASU project goals #3 and #4 are designed to achieve Competitive Preference Priority 1. *Goal 3 – Expand recruiting to attract more STEM-oriented residency candidates for high-need subject areas such as math and science*

Objective A: Increase number of secondary math and science graduates from 24% to 30% new teachers per year over five years.

Goal 4 - Create coursework around STEM content knowledge and best-practice pedagogy for training Residents and Mentors, especially those teaching in elementary grades.

Objective A: Create new STEM content coursework for elementary teachers in math and science

To achieve Goals 3 and 4, CBTR/ASU will invest in more aggressive outreach and marketing to generate more leads for potential math and science Residents who have already demonstrated strength through a degree in that field or professional experience. Additionally, CBTR supports all teachers' development of their own positive identities as mathematicians and scientists, as it has been shown that teacher identities dramatically influence students' (Bielock, 2013), and that by third grade, half of students make up their minds about their own futures in STEM content areas (Weinburg, 1998). CBTR and ASU will collaborate to create appropriate STEM content knowledge and pedagogy courses targeted to elementary teachers, with inquiry-based STEM experiences both for the classroom and in the field.

C. Management Plan

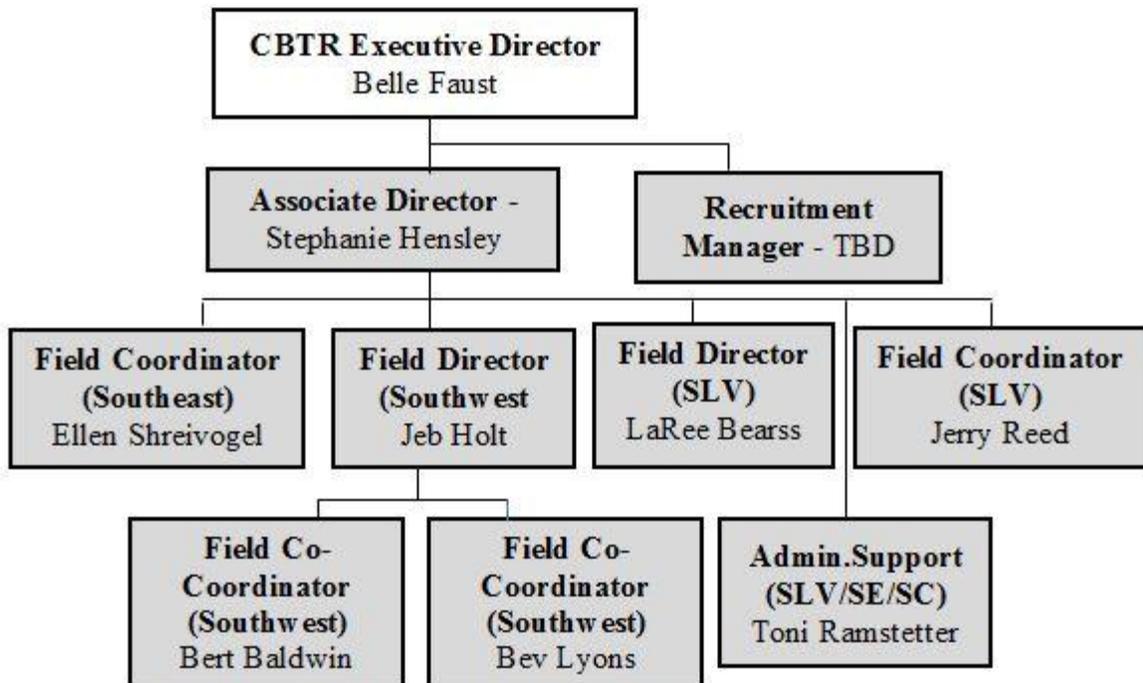
CBTR/ASU has an existing governance and decision-making structure that permits all partners to plan, implement and assess the impact of project activities. Leaders from each partner are involved, and all are committed to data-driven decision making.

Responsibilities, Timelines & Milestones – Colorado Boettcher Teacher Residency is managed as a collaborative partnership. PEBC is the lead partner and has primary management, administrative and fiscal responsibility. **Dr. Belle Faust serves as the CBTR Executive Director, and the TQP Rural Expansion Project Director.** CBTR has a Rural Residency

Advisory Board that meets face-to-face annually. There are weekly and monthly partner conference calls with key stakeholders. These are the primary communication and coordination vehicles regarding project goals. The MOU between ASU and PEBC provides a broad overview on responsibilities and procedures for operations. All partners commit to participation in the decision making and are involved in analyzing evaluation results to make continuous program improvements.

Rural Residency Advisory Board includes: Rosann B. Ward, President, PEBC; Dr. Belle Faust, Executive Director, CBTR; Dr. David Svaldi, President Adams State University; Dr. Ed Crowther, Chair, Adams State University, Department of Teacher Education; George Welsh, Superintendent, Center School District; Robert Alejo, Superintendent, Alamosa School District; Curt Wilson, Superintendent, North Conejos School District; Timothy W. Schultz, President, Boettcher Foundation; and Katie S. Kramer, Vice President, Boettcher Foundation.

Adams State University Teacher Education Department, with assistance from the Mathematics and Science Departments, supports the identified needs of the school districts, especially the training of high-quality STEM teachers, and through this collaboration with PEBC and CBTR, create a sustainable human capital pipeline for effective educators. Ms. Stephanie Hensley is the Associate Director of the Residency and primary point of contact for Residents and Mentors as ASU. CBTR collaborates intensively with Adams State's Teacher Education Department to provide Residents Master's level coursework and training.



Qualifications of Key Personnel (Relevant Training & Experience)

Adams State: *Mr. Ed Crowther, Chair of the Adams State Teacher Education Department, and a Professor of History, Government & Philosophy, has taught and provided academic leadership at Adams State for over 25 years. He received his PhD in 1988 from Auburn University. Mr. Kurt Cary, Associate Chair of the Adams State Teacher Education Department, has taught and provided academic leadership in San Luis Valley public schools for over 30 years. Since 2003 he has been part of Adams State, specializing in principal licensure and academic leadership. Crowther and Cary will oversee curriculum redesign, review evaluation outcomes, provide IHE perspective with continual feedback, and make suggestions for improvements. Ms. Stephanie Hensley, Assistant Professor at Adams State, is also a part-time CBTR Associate Director of the rural program. Stephanie has a Master’s Degree in Education, with particular expertise in literacy, and works closely with Residents, Mentors and School Districts in support of the residency program. She is pursuing her Doctorate. Ms. LaRee Bearss (SPED), Teacher on*

Special Assignment works directly for CBTR as a Field Director, observing and coaching Mentors and Residents. She has a Master's degree in Special Education. *Dr. Matt Nehring is a Professor of Physics* and Department Chair of Chemistry, Computer Science, and Mathematics. Dr. Nehring will lead the development of new math content knowledge tightly linked with instructional pedagogy. *Dr. Benita Brink is a Professor of Biology* and Department Chair for Biology and Earth Science and the primary science lead related to content knowledge.

PEBC/CBTR: *Rosann B. Ward, PEBC President* has led the expansion of the professional development work to a national scale, helped launch and expand the Colorado Boettcher Teacher Residency, and started the online education news website Chalkbeat Colorado (formerly Education News Colorado). Ward earned her Bachelor's degree in Classics from Hofstra University and is a Phi Beta Kappa graduate. *Belle Faust, Ph.D., Executive Director, Colorado Boettcher Teacher Residency* oversees the work of the Residency, and has expertise in curriculum, instruction and assessment. Faust works with university partners and PEBC staff to develop program curricula, and she is guiding integrated internal and external evaluation plans to assess the impact and efficiency of the organization. Faust earned a Ph.D. in Quantitative Research Methods from the University of Denver. *Wendy Ward Hoffer, M.A.* plays a leadership role at PEBC in developing learning opportunities and resources designed to promote best practices in STEM pedagogy. She has authored two method texts: *Science as Thinking* (Heinemann, 2009) and *Minds on Mathematics* (Heinemann, 2012). Hoffer holds a Master's degree in Education from Stanford University. *Moker Klaus-Quinlan* serves as a Director of Education and oversees professional development for the rural Residency program. Moker's experience as an educator includes teaching elementary and middle school, as well as serving as

a Reading Specialist, ELL Coordinator, mentor teacher, and instructional coach. She holds a Master’s degree in K-12 literacy from California State University.

Performance Feedback & Continuous Improvement

Collecting and using data on student achievement to understand effectiveness of teacher preparation on student learning will be an important learning for CBTR/ASU. Residents will be participating in PLCs in a process of continuous inquiry and improvement based on test scores and student work samples. Partners are committed to using data for continuous improvement. CBTR and ASU faculty will use data to assess effectiveness and determine program improvements. Student achievement data will be compared for teachers in the program, and teachers not in the program, to show positive effects of the residency training.

The following provides an overview of the implementation plan with overarching goals tied to measurable objectives, as well as activities, milestones and timeline.

GOALS	OBJECTIVES	ACTIVITIES	MILESTONES	TIMELINES
Goal #1 Expand # of CBTR/ASU Graduates Abs. Priority #2	Increase capacity of residency program to increase number of graduates from 23 to 51 new teachers per year.	Residents study graduate-level coursework through ASU Residents are grouped into geographic collaborative cohorts for shared learning and PLCs	-Expand program to serve more Residents -More staff hired to manage growing number of Residents -Integration of training and induction support	Years 1-5
Goal #2 Expand recruiting to attract more highly-qualified and diverse	Increase diversity of applicant pool through marketing and recruitment to expand percentage of	CBTR trains more recruitment staff CBTR expands use of online and national outlets for advertising	-Target communities in which CBTR/ASU schools are located for “grow your own” candidates	Years 1-5 (Aug – May)

<p>candidates</p> <p>Abs. Priority #2</p>	<p>minority candidates from 18% to 25%</p> <p>Increase quantity of highly-qualified applicant pool through marketing and recruitment to maintain an application admissions rate of 20% or lower.</p>	<p>CBTR works with consultants to develop new recruiting materials</p>	<p>-Set specific recruitment targets and track number of inquiries and applications by diversity</p>	
<p>Goal #3</p> <p>Expand recruiting to attract more STEM-oriented residency candidates for high-need subject areas such as math and science</p> <p>Comp. Pref. Priority #1</p>	<p>Increase number of secondary math and science graduates from 24% to 30% new teachers per year over five years.</p>	<p>CBTR trains more recruitment staff</p> <p>CBTR expands use of online and national outlets for advertising specifically to math and science graduates</p>	<p>-Target communities with existing math and science expertise such as recent college graduates</p> <p>-Set specific recruitment targets and track number of inquiries and applications by math and science interest and ability</p>	<p>Years 1-5 (Aug – May)</p>
<p>Goal #4</p> <p>Create coursework around STEM content knowledge and best-practice pedagogy for training Residents and Mentors, especially those teaching in</p>	<p>Create new STEM content coursework for elementary teachers in math and science</p>	<p>ASU professors work with CBTR adjunct faculty to create courses</p> <p>Establish monthly student data review meetings to tie feedback to curriculum and training of Residents</p>	<p>New STEM content knowledge and pedagogy courses are created</p> <p>Implement new courses with Residents and Post-Residents</p>	<p>Create Math course Spring 2015 and begin implementing Fall 2015</p> <p>Create Science Course Spring 2016 and begin implementing Fall 2016</p>

elementary grades.				
Comp. Pref. Priority #1				
Goal #5 Use student growth and achievement data, and train Residents in assessment literacy, to build teacher effectiveness and enhance teacher preparation Abs. Priority #2	Residents participate in collecting, sharing and analyzing student achievement data. Teacher preparation curriculum incorporates assessment literacy elements	Partners establish new protocols for linking student data to teacher effectiveness Partners pilot new assessments in all training sites with Mentors and Residents	AIR completes partner discussions on evaluation model with ASU, CBTR and school districts Implement usage of assessment literacy tools in all project classrooms Track outcomes of implementation and effectiveness	Year 1 : planning and design Years 2-5: implement

D. Project Evaluation

American Institutes for Research (AIR) has the expertise and experience to conduct the rigorous formative and summative evaluation activities as described in this proposal. Building on its more than 65 years of experience evaluating education programs and policies, and researching critical issues, AIR has successfully conducted evaluations of former Teacher Quality Partnership grantees as well as grantees of similar federal programs. AIR’s approach to evaluation is thorough and methodologically sound.

QUALIFICATIONS

Highlights of AIR’s qualifications to conduct this work include the following:

Knowledge of educator effectiveness reform. AIR’s team of researchers has a deep knowledge of educator effectiveness reform, including technical knowledge of educator

evaluation metrics and systems, educator preparation policy and practice, student-classroom-teacher data linkages, teacher retention models, and the impacts on educators and students of educator effectiveness system reform.

Experience conducting teacher residency evaluations. AIR is currently conducting and has conducted several educator residency evaluations, including the Denver Teacher Residency Evaluation. AIR conducts both formative and summative evaluations, using a quasi-experimental design, a mixed-methods approach, and value-added modeling to measure program effectiveness on teachers' efficacy and retention, and impact on student achievement.

Experience conducting mixed-methods program evaluations. In conducting program evaluations, researchers at AIR employ quantitative and qualitative research methods using a wide variety of data collection techniques, including surveys, in-depth interviews, focus groups, and quasi-experimental designs intended to estimate program effects in the absence of a controlled experimental environment. AIR has extensive experience drawing on multiple data sources to provide clients with actionable formative feedback and summative program results.

Demonstrated Effectiveness. AIR's recent experience includes several projects that demonstrate our capability to perform the scope of work and meet TQP program requirements. A relevant AIR project with a brief descriptions follows:

Denver Teacher Residency Evaluation (2010–15). AIR is conducting a rigorous and trustworthy evaluation of the Denver Teacher Residency (DTR) Program in partnership with the Denver Public Schools, the University of Denver, and Urban Teacher Residency United. The evaluation study provided DTR partners with data that support programmatic decisions by measuring program effectiveness using a rigorous quasi-experimental design. The mixed-methods evaluation carefully tracked implementation fidelity by assessing achievement of

implementation, recruitment, placement, and retention benchmarks. The methods used to collect data on the fidelity of implementation included document reviews, surveys and interviews with residents and administrators. The evaluation design measured the program's efficacy using a propensity score matching approach that compared program participants with a similar comparison group that did not participate in the study and examined factors associated with resident success. In addition, the evaluation assessed which program mechanisms affect teacher retention and student achievement gains.

EVALUATION PLAN

AIR will conduct a mixed-methods evaluation to provide PEBC with formative and summative feedback about the implementation and impact of the proposed expansion of the Colorado Boettcher Teacher Residency (CBTR) program. The evaluation will address the following research questions about the program's implementation and impact

1. How was the CBTR program implemented?
 - 1.1 What are the demographic characteristics of CBTR Residents, and how do they differ from those of other novice teachers?
 - 1.2 Were the various components of the residency program implemented as planned?
 - 1.3 What percentage of CBTR Residents successfully completed the program?
 - 1.4 Do CBTR residents report feelings of efficacy, particularly with respect to STEM content and pedagogy?
 - 1.5 What did stakeholders consider to be the program's main successes and challenges?
2. What were the impacts of the CBTR program?
 - 2.1 How do principals who hire CBTR-trained teachers rate their performance?
 - 2.2 Are CBTR-trained teachers retained at higher rates than other novice teachers?

2.3 Do CBTR-trained teachers improve student achievement more than other novice teachers?

AIR will address these research questions in each of the five years of the grant by interviewing Residents, Mentors, and principals; collecting survey data from principals who hire CBTR-trained teachers; and analyzing extant program, human resources, and student achievement data. Findings memos on implementation will provide PEBC with actionable data for program improvement at the end of each school year. Annual reports will summarize the implementation and impact of the program at the end of each calendar year following implementation. The sections below describe the evaluation plan in detail.

Data Sources

AIR will use interviews, surveys, and extant data to assess the CBTR program’s implementation and impact. Data collection instruments will be developed collaboratively with CBTR staff. These data sources are described in further detail below. See Table 1 for a summary of the data sources that will be used to address each of the evaluation’s research questions.

Table 1 Research Questions and Data Sources

Research Questions	Resident Interviews	Mentor Interviews	Principal Interviews	Program Staff Interviews	Hiring Principal Survey	Post-Program Resident Interviews	Program Data	District Extant Data	Student Achievement Data
1. Implementation									
1.1 What are the demographic characteristics of CBTR							X	X	

Residents, and how do they differ from those of other novice teachers?									
1.2 Were the various components of the residency program implemented as planned?	X	X	X	X					
1.3 What percentage of CBTR Residents successfully completed the program?							X		
1.4 Do CBTR Residents report knowledge of, comfort with, and use of STEM content and pedagogy?	X				X				
1.5 What did stakeholders consider to be the program's main successes and challenges?	X	X	X	X	X	X			
2. Impact									
2.1 How do principals who hire CBTR-trained teachers rate their performance?					X				
2.2 Are CBTR-trained teachers retained at higher rates than other novice teachers?							X	X	
2.3 Do CBTR-trained teachers improve student achievement more than other novice teachers?									X

Site Visits. In the spring of each year, AIR will also conduct site visits in a sample of five schools participating in the CBTR program. Schools will be sampled purposively in partnership with PEBC to be representative of different characteristics that are important to the program (e.g., grade level, school size).

In each school, AIR will interview all Residents and Mentors, as well as the principal. AIR anticipates interviewing a total of 10 Residents and 10 Mentors (i.e., an average of two each per school) for a total of 25 interviews across schools (including the 5 principal interviews). If there are more than 10 Residents and Mentors at the sampled schools, AIR will randomly select 10 of each to be interviewed. If there are fewer than 10 Residents and Mentors, then AIR will

work with PEBC to identify additional nearby schools participating in the residency program that may be visited in the same trip.

Interviews with Residents and Mentors will include topics such as the level and quality of training related to the residency program, structure of and experience with the residency program in the school; Mentor-Resident relationship; support from other Residents (e.g., through the weekly seminars); satisfaction with the program; types of support provided by school leaders and program staff, feelings of efficacy, particularly with respect to STEM content and pedagogy; and major successes and challenges of the program. The content of the two instruments will be similar, but different versions of the interview protocol will be tailored for use with Residents and Mentors, respectively. Interviews with principals will include topics such as the structure of the residency program in the school, other supports provided to teachers in the school, reasons for participating in the PEBC program, and major successes and challenges of the program. Interviews will use semi-structured protocols and last approximately 45 minutes. Interviews will be recorded (assuming the interviewees give permission) and transcribed to ensure accuracy.

Post-Program Resident Survey. AIR will conduct a follow-up electronic survey with CBTR participants after they complete their residency, beginning in the spring of the second year of the grant (spring 2016). The survey will provide information about post-residency supports from CBTR and other sources, as well as perspectives on the program's efficacy from the perspective of a full-time teacher. Topics measured by the survey will include frequency and quality of support from the CBTR (e.g., communication with the Post-Residency Director); characteristics of district induction programs; satisfaction with the residency; feelings of efficacy, particularly with respect to STEM content and pedagogy; and major successes and challenges of the residency. The brief (i.e., 15-20 minute) survey will include primarily fixed

response items with Likert-type response scales and a limited number of open-response items to allow for unexpected responses.

Hiring Principal Survey. AIR will also survey principals in all schools that hire CBTR Residents, beginning in the spring of the second year of the grant (spring 2016). The electronic survey will include topics such as frequency and type of communication with CBTR staff, performance of former CBTR residents, reasons for hiring CBTR residents, and overall satisfaction with the program. The brief (i.e., 10-15 minute) survey will include primarily fixed response items with Likert-type response scales and a limited number of open-response items to allow for unexpected responses. A survey incentive (e.g., gift card lottery) will be offered to encourage high response rates.

Extant Data. In addition to the new data collection described above, the evaluation will draw on existing data collected by the CBTR program and participating districts. Information on participants' completion of the residency and their placements in partnering school districts will be collected from the CBTR program. Human resources data and student achievement data will be collected from partnering districts. Human resources data will include former Residents' date of hire, school, and grade and subjects taught, as well as the demographic characteristics of all teachers in the district with the same number of years of experience. In addition, AIR will gather from districts information on the percentage of highly qualified teachers hired by each partnering district that are from the CBTR program and are in various subgroups (e.g., underrepresented groups, teaching high-need subject areas), as required by the Higher Education Act. AIR will also request from districts data on student performance as measured by the Colorado state standardized test (scheduled to be the Partnerships for Assessment of Readiness for College and Careers assessment, beginning in spring 2015).

Data Analysis

Data collected will be analyzed using the following approaches.

Interviews. Interviews will be recorded and transcribed (assuming participants give permission for recording) and coded using step-by-step procedures to bring focus to the data while still leaving room for exploration and discovery. Interview transcripts will be analyzed using NVivo qualitative software, utilizing an inductive approach and incorporating a systematic method of managing data through reduction, organization, and connection (Dey, 1993; LeCompte, 2000). This process relies on structured procedures for coding and categorizing the data in order to recognize patterns within and across sites.

Surveys. Descriptive analyses will be used to examine the distribution of responses to survey items. For groups of items measuring a common latent trait (e.g., training quality), AIR will use the Rasch model for ordered categories (Andrich, 1978; Rasch, 1980; Wright & Masters, 1982; Wright & Stone, 1979) to evaluate the construct's reliability and create estimates of respondents' latent traits. Rasch models are probabilistic models that allow one to calculate a single scale score, or a summary of data, obtained from conceptually related groups of survey items. The general rating scale model can be written in the following format (Linacre, 2005):

$$\pi_{nix} = \frac{\exp \sum_{j=0}^x (\beta_n - (\delta_i + \tau_j))}{\sum_{k=0}^m \exp \sum_{j=0}^k (\beta_n - (\delta_i + \tau_j))} \quad (1)$$

Equation 1 describes the probability that a respondent n , with ability β_n on the underlying construct, responds with a rating of x to item i of difficulty δ_i (where the response scale is ordered from 0 to m). The τ_j represent the rating scale thresholds, or transition points, between

categories. Open-ended items will be analyzed using NVivo using the same approach used for analyzing interview data.

Extant Data. AIR will descriptively analyze demographic data to examine the extent to which CBTR residents differ from the broader population of novice teachers (Research Question 1.1). We will also descriptively analyze program completion data to find the percentage of residents that complete their residency (Research Question 1.3).

Analyses of retention and student achievement data will use regression analysis, or value-added modeling, to estimate program impacts and address Research Questions 2.2 and 2.3, respectively. These analyses will begin in the third year of the grant, as participants will still be in the residency in the first year, and student achievement and retention data will likely not be available until the fall after the second school year.¹ Regression analysis accounts for the fact that different types of students may be assigned to each teacher, statistically controlling for characteristics other than the CBTR program that might cause these outcomes to be higher or lower.

Analyses will compare the outcomes of CBTR teachers (or their students) to the outcomes of other teachers with the same number of years of experience (or their students). For example, in the first year after completion of the residency program, the achievement of the students of CBTR teachers will be compared to the achievement of students of other first-year

¹ The sample size of Residents may be too small for regression analysis in the first year, when there will likely be 20 teachers or less. If regression analysis is not possible for one or both outcomes, descriptive analysis will be used. Sample sizes will increase in later years as more teachers complete the program.

teachers. Analyses in each year of the grant will pool all teachers who have completed the residency program (and their comparison groups); exploratory analyses will examine how impacts vary by cohort.

Following the approach employed by Papay, West, Fullerton, and Kane (2011) to examine the effect of the Boston Teacher Residency program, our preferred model specification will take the following form:

$$Y_{ijkl} = \beta_0 + \beta_1 CBTR_{jkl} + \beta_2 X_{ijkl} + \beta_3 Exp_{jkl} + \beta_4 District_i + \beta_5 School_{kl} + \theta_{jkl} + \varepsilon_{ijkl} \quad (1)$$

Here Y_{ijkl} is the test score for student i taught by teacher j in school k in district j (standardized by grade), β_0 is a constant term; $CBTR_{jkl}$ is an indicator for whether teacher j participated in the CBTR program or not; β_1 is the CBTR treatment effect; X_{ijkl} is a set of student characteristics (e.g., test score in the previous year, gender, race or ethnicity); β_2 is a set of coefficients showing the relationship between those characteristics and the outcome; Exp_{jkl} is the number of years of experience of each teacher; β_3 is the average difference in test scores associated with teachers with that $District_i$ and $School_{kl}$ are sets of district and school fixed effects, respectively; and β_4 and β_5 are sets of coefficients showing the average test score for each district or school

relative to a base district or school, respectively; θ_{jkl} is a teacher-level random effect; and ε_{ijkl} is a student-level random effect.²

AIR will compare the retention rates of former CBTR Residents to retention rates of other teachers with the same number of years of experience. Retention analyses will use the following model:

$$\ln \left[\frac{\Pr(Y_{jkl}=1)}{\Pr(Y_{jkl}=0)} \right] = \beta_0 + \beta_1 CBTR_{jkl} + \beta_2 Exp_{jkl} + \beta_3 District_l + \beta_4 School_{kl} \quad (2)$$

Here, Y_{jkl} is the binary outcome for teacher j in school k in district l indicating whether each teacher is still teaching in the placement school, which is converted into log odds through the logistic link function and other terms are the same as in equation 1 above.

The CBTR program may affect retention and student achievement either by providing better training and support, or by recruiting teachers with different characteristics than those who enter the teaching profession through other programs. To estimate the combined effect of both the program's training and applicant pool, impacts on retention and student achievement will be

² Here, the nesting of students within districts and schools is accounted for by fixed effects.

Random effects models such as hierarchical generalized linear models also may be used if the numbers of districts and schools are large enough and can plausibly be considered a random sample of all districts or schools in the state.

estimated without controlling for teacher characteristics.³ However, AIR will also explore models that do control for teacher characteristics, which will estimate the effect specifically of the program's training and support. These models will replace the term Exp_{jkl} with a set of teacher characteristics, Z_{jkl} , that will include years of experience, gender, race and ethnicity, and so on.

A limitation of the value-added approach for student achievement is that it is possible that the students taught by resident teachers differ from those taught by nonresident teachers in ways that are not captured by the characteristics on which data are available. To the extent that this is the case and these unobserved characteristics contribute to student test scores, we cannot disentangle the effect of having a resident teacher from these differences. To explore this possibility, we will use a falsification test that examines the program's "impact" on students' test scores in the year before they were taught by CBTR teachers. If such an impact is found, this will provide evidence of important unobserved differences, although the test may not be definitive (Rothstein, 2010; Goldhaber and Chaplin, 2012).

Communicating and Reporting

The CBTR program is multifaceted and will likely evolve over the course of the grant period. To ensure the findings from our evaluation are relevant and informative to district decision making, AIR will work collaboratively with CBTR/ASU to finalize the evaluation plan

³ Controlling for teacher characteristics would statistically control for differences between CBTR teachers and other teachers, excluding any effect obtained through CBTR attracting different types of applicants than other programs.

at the beginning of the grant period. This will be facilitated by an in-person project initiation meeting to discuss and understand PEBC and stakeholder needs. AIR will convene such a meeting each year to discuss potential adjustments to the evaluation approach. In addition, to facilitate ongoing coordination, AIR will hold monthly updates with key CBTR staff.

The CBTR evaluation is designed to provide continuous progress monitoring through both useful formative feedback and rigorous summative feedback. To provide this formative feedback, AIR will provide memos summarizing the results from each spring data collection. These will be delivered by the end of the school year to support planning and program improvement for the following school year. AIR will present the memos via phone or video conference and facilitate conversation about the findings.

In addition, AIR will provide annual reports synthesizing implementation findings across data sources and reporting the results of impact analyses for student achievement and retention. Annual reports will be delivered at the end of each calendar year, beginning in the third year of the grant (since student achievement and retention data for each cohort will not be available until the beginning of the school years following the residency) and will be presented via phone or video. Annual reports will integrate any CBTR feedback on the implementation memos.

Finally, AIR will assist PEBC in preparing GPRA and HEA reports. Many GPRA and HEA measures are addressed directly by the evaluation's research questions; additional data required for other measures (e.g., program costs) will be collected from PEBC staff. For a description of outcomes and data sources to be examined to address GPRA and HEA reporting requirements, see Table 2. For a timeline of evaluation activities, see Table 3.

Table 2. CBTR Objectives and Correlated Performance Measures

Performance Measure	Definition	Relevant Outcome(s)	Data Source
GPRA Measure 1 (Graduation)	Attain initial certification/licensure by passing all necessary certification/licensure assessments and attain a master's degree within two years of beginning the program	Teacher licensure and master's degree attainment	CBTR program staff
GPRA Measure 2 (Employment Retention)	The percentage of beginning teachers who are retained in teaching in the partner high-need LEA three years after being hired by the high-need LEA	Teacher retention	Extant district human resources data
GPRA Measure 3 (Improved Scores)	The percentage of grantees that report improved scaled scores on assessments for initial State certification or licensure of teachers	PLACE/Praxis II scores	CBTR program staff
GPRA Measure 4 (Student Learning)	The percentage of grantees that report improved aggregate learning outcomes of students taught by new teachers.	Student state assessment scores (TCAP/PARCC)	Extant student achievement data
GPRA Efficiency Measure (Employment Retention)	The cost of a successful outcome where success is defined as retention of the teacher in the partner high-need LEA three years after the teacher is hired by the high-need LEA.	Program costs, teacher retention	CBTR program staff, extant district human resources data
GPRA Short-Term Measure 1 (Persistence)	The percentage of program participants who were not scheduled to graduate in the previous reporting period and persisted in the postsecondary program in the current reporting period.	Residency completion	CBTR program staff
GPRA Short-Term Measure 2 (Employment Retention)	The percentage of beginning teachers who are retained in teaching in the partner high-need LEA one year after being hired by the LEA.	Teacher retention	Extant district human resources data
HEA 204(a)(i)	Increase achievement for all prospective and new teachers, as measured by the eligible partnership	PLACE/Praxis II scores, student state assessment scores (TCAP/PARCC)	CBTR program staff, student state assessment scores
HEA 204(a)(ii)	Increase teacher retention in the first three years of a teacher's career	Teacher retention	Extant district human resources data
HEA 204(a)(iii)	Increase improvement in the pass rates and scaled scores for initial State certification or licensure of teachers	PLACE/Praxis II scores	CBTR program staff

Performance Measure	Definition	Relevant Outcome(s)	Data Source
HEA 204(d)(1)	Increase the percentage of highly qualified teachers hired by the high-need LEA participating in the eligible partnership	Teacher hiring	Extant district human resources data
HEA 204(d)(2)	The percentage of highly qualified teachers hired by the high-need LEA who are members of underrepresented groups;	Teacher hiring	Extant district human resources data
HEA 204(d)(3)	The percentage of highly qualified teachers hired by the high-need LEA who teach high-need academic subject areas (such as reading, mathematics, science, and foreign language, including less commonly taught languages/critical foreign languages)	Teacher subject area assignments	Extant district human resources data
HEA 204(d)(4)	The percentage of highly qualified teachers hired by the high-need LEA who teach in high-need areas (including special education, language instruction educational programs for limited English proficient students, and early childhood education);	Teacher subject area assignments	Extant district human resources data
HEA 204(d)(5)	The percentage of highly qualified teachers hired by the high-need LEA who teach in high-need schools, disaggregated by the elementary school and secondary school levels	Teacher school placements	Extant district human resources data
HEA 204(d)(6)	As applicable, the percentage of ECE program classes in the geographic area served by the eligible partnership taught by early childhood educators who are highly competent	N/A	N/A
HEA 204(d)(7)(i)	As applicable, the percentage of teachers trained to integrate technology effectively into curricula and instruction, including technology consistent with the principles of universal design for learning	Master's degree attainment	CBTR program staff
HEA 204(d)(7)(ii)	As applicable, the percentage of teachers trained to use technology effectively to collect, manage, and analyze data to improve teaching and learning for the purpose of improving student academic achievement.	Master's degree attainment	CBTR program staff

Table 3 Timeline of Major Evaluation Activities

Evaluation Activity	2014		2015				2016				2017				2018				2019	
	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
Cohort residency participation.	C1	C1	C1		C2	C2	C2		C3	C3	C3		C4	C4	C4		C5	C5	C5	
Finalize or adjust evaluation plan.	X			X				X				X				X				
Develop or revise survey and interview protocols.	X			X				X				X				X				
Administer surveys and conduct site visits.			X				X				X			X					X	
Administer hiring principal survey and conduct post-residency interviews.							X				X			X					X	
Submit and present interview and survey findings.				X			X				X			X					X	
Collect residency completion and job placement data from PEBC.					X				X				X				X			
Collect extant student achievement data.									X				X				X			
Collect extant human resources data.									X				X				X			
Student achievement impact analysis.									X	X			X	X			X	X		
Retention impact analysis.									X	X			X	X			X	X		
Submit and present annual report.										X				X					X	

Note: C1 = Cohort 1, C2 = Cohort 2, etc.