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## FREQUENTLY USED ACRONYMS

ADE	Arizona Department of Education
ASU	Arizona State University
ATA	Arizona Teachers Academy
BDI	Biodesign Institute
CFA	Center for the Future of Arizona
CLAS	College of Liberal Arts and Sciences
CPE	Continuing Professional Education
CPL	Continued Professional Learning
CS	Computer Science
CTT	Collective Teaching Team
ELLs	English Language Learners
IAFSE	Ira A. Fulton Schools of Engineering
iTeachELLs	Integrating STEM, Literacy, and Language to Prepare All Teachers to Teach English Language Learners
K-12	Kindergarten through Twelfth Grade Education
MLFTC	Mary Lou Fulton Teachers College
OCE	MLFTC Office of Clinical Experience
OMCSS	Office of the Maricopa County School Superintendent
ODS	Office of Data Strategy, MLFTC
OSS	Office of Student Services, MLFTC
P-12	Pre-kindergarten through Twelfth Grade Education
REW	Reimagining the Education Workforce for the 21 <sup>st</sup> Century: Preparing Teachers through Personalized Learning Modules and Diversified Clinical Experiences
SoS	School of Sustainability
SPED	Special Education
STEM	Science, Technology, Engineering, and/or Math Education
STEM-CS	Science, Technology, Engineering, and/or Math Education, With a Particular Focus on Computer Science
UOEEE	University Office of Evaluation and Educational Effectiveness
UOIA	University Office of Institutional Analysis

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## PROJECT NARRATIVE

### I. PRIORITIES

Since 2009, Mary Lou Fulton Teachers College (MLFTC) has prepared over 5,000 new teachers through the nationally recognized iTeachAZ model (Arizona State University, 2018a, 2018b; Schlesinger, n.d.; U.S. Department of Education, 2014). This model, with its hallmark full-senior-year residency and integral district partnerships, produces more than 600 high-quality teacher graduates per year (more than 750 in 2017-2018). Approximately 85% of MLFTC graduates are hired in full-time positions immediately after graduation (P. Marsh, personal communication, June 19, 2018), which is consistent with nationwide trends (i.e., 75-87%; Mahuron, n.d.). However, current graduation rates are insufficient to meet the sustained growing demand for teachers across the nation, particularly in specialization areas where teacher shortages are chronic and continue to worsen, such as mathematics, science, special education, and the instruction of limited English proficient students.

The iTeachAZ model has inspired other colleges of education, with almost 50 higher education teacher preparation providers, alternative pathway programs, education advocacy groups, non-profit organizations, or private sector organizations having visited our program. Despite this excellent track record, we recognize that we must change to even better meet the needs of our prospective teachers in order to produce more teachers with a different, novel approach to teaching. This change will benefit our district partners, and ultimately, their K-12 students and families.

The proposed project, *Reimagining the Education Workforce for the 21st Century: Preparing Teachers through Personalized Learning Modules and Diversified Clinical Experiences* (REW), will capitalize on the benefits of the field-based iTeachAZ model to address

elevating the status of education and educators by (a) attracting prospective teachers who are fitting for this degree; (b) providing them with opportunities to develop a strong identity, even a specialization, through an abundance of field experiences; (c) strengthening their transition to the field as certified educators who hold true to their vision of self; and (d) supporting them during the induction phase of becoming a professional.

Our project addresses **Absolute Priority 1 – Partnership Grants for the Preparation of Teachers** by enhancing and innovating MLFTC’s undergraduate teacher preparation programs at Arizona State University (ASU) to better meet the needs of our students (prospective teachers) and district partners. Ongoing conversations with prospective teachers, faculty, and district partners (i.e., in-service teachers and district leadership) indicate the need for clinical experiences to start earlier in the teacher preparation program and represent diverse learning models (e.g., digital and blended classrooms) and settings (e.g., formal and informal learning environments), and for the overall teacher education programs to include opportunities for personalization and specialization prior to, and following, graduation (e.g., during induction and ongoing professional learning).

REW will also address Competitive Preference Priorities 1 and 2. It will address **Competitive Preference Priority 1 – Promoting Science, Technology, Engineering, and/or Math (STEM) Education, With a Particular Focus on Computer Science (STEM-CS)** by building a suite of pre-service and in-service STEM-CS offerings and specializations.

Additionally, we will focus on increasing the pipeline of STEM-CS teachers through strategic recruitment, retention, and graduation of prospective teachers while creating specializations for in-service teachers who want to more meaningfully incorporate STEM-CS into their teaching.

REW will address **Competitive Preference Priority 2 – Promoting Effective Instruction in Classrooms and Schools** in two ways. First, we will intentionally teach the knowledge, skills, and dispositions needed to effectively teach in 21st-century learning models (e.g., digital learning spaces, blended classrooms). Second, in alignment with existing recruitment and retention goals for MLFTC, as well as ASU’s Charter (Office of the President, 2018) with its overall focus on inclusivity and student success, we will focus on recruitment and retention of effective, diverse educators by including undergraduates that represent the diverse demographics of K-12 students in schools in Arizona and nationwide.

#### **I.A. Absolute Priority 1 – Partnership Grants for the Preparation of Teachers**

In this project, we will build on the iTeachAZ successes in a way that better meets the current needs of our prospective teachers and district partners – both of whom are looking for clinical experiences that happen earlier and in more diverse learning models (e.g., digital and blended classrooms) and locations, as well as more opportunities for personalization and specialization in learning experiences. **Ultimately, we are reimagining a clinically-rich educator preparation program grounded in research evidence with a comprehensive curriculum that is delivered via blended, competency-based, flexible learning modules that allow for personalization and specializations.** Beyond enhancing the knowledge of prospective teachers in our teacher education programs, these modules will be used for a variety of purposes by teacher educators who work with our students, by professional developers in our partner districts who support induction of our graduate students, and by in-service teachers who access the modules via the open access platform. The modules will be created by teams of content experts and instructional designers in a way that will allow for personalization, align to diverse clinical settings (e.g., blended and/or competency-based classrooms), and account for the wide

variety of roles educators need to develop. These modules will enable prospective teachers, recent graduates (i.e., induction participants), and in-service teachers to develop specializations based on their interests or needs, as well as learn to work in educator teams to meet the needs of the whole child.

**I.B. Competitive Preference Priority 1 – Promoting Science, Technology, Engineering, and/or Math (STEM) Education, With a Particular Focus on Computer Science**

**I.B.1. Promoting computer science in coursework.** MLFTC currently offers robust content offerings in the STEM subject areas, offerings that will be further enhanced by the creation of a STEM-CS specialization as described in section I.A.2. CS is relatively underdeveloped at MLFTC, however, and building a strong CS program will be a priority of this grant given the current needs in the country and in Arizona. We recognize that computing permeates every aspect of society, creating a high demand for technological innovations. This demand drives the economy and creates a direct impact on the job market. The U.S. Department of Labor estimates 1.1 million computing-related job openings in the U.S. by 2024, but more than two-thirds of these jobs could go unfilled due to the insufficient pool of college graduates with computing-related degrees.

Computing underpins virtually every other STEM and non-STEM field as a highly versatile and sought-after skill set that is essential in today's information economy. As computing has become an integral part of our world, public demand for CS education is high. Nine in ten parents would like their child's school to offer CS. In fact, most Americans believe CS is as important to learn as reading, writing, and math (Google & Gallup, 2015). Many of today's students will be using CS in their future careers across all fields (changetheequation.org, 2015). Unfortunately, the opportunities to learn CS do not match public demand.

In response to the pressing need for high quality CS education at the K-12 level, Arizona is moving rapidly to establish policies and infrastructure for teaching and learning CS. Creation of K-12 CS education standards are underway at the Arizona Department of Education (2018), with adoption of the standards expected in late fall 2018. The state legislature has approved funding for a Computer Science Program Fund (H.B. 2663 § 5, 2018). Arizona Governor Doug Ducey joined the Governors for Computer Science (GovsForCS), a partnership of leaders from 17 states committed to advancing and funding CS education at the K-12 level, earlier this year.

MLFTC is leading the effort to bring equitable CS education to all K-12 students in Arizona State. MLFTC Professor Brian Nelson is the co-chair of the Computer Science for Arizona (CSforAZ) initiative – a large-scale task force focused on bringing computer science education and professional development to students across the state while informing CS education policy (CSforAZ, 2017). CS for AZ brings together partners from the three Arizona state universities, the Arizona Governor’s office, the Arizona Department of Education and School Board, school district leaders, teachers, non-profits (code.org, AZ Tech Council, Science Foundation Arizona), and industry (Microsoft, Google). As part of his work with CSforAZ and MLFTC, Dr. Nelson is designing a series of modules and continued professional learning (CPL) modules for prospective teachers and in-service teachers. By the second year of the grant, prospective teachers will be able to take the following modules: Introduction to CS for Educators, Computational Thinking across the Curriculum, Teaching CS Principles, Teaching AP CS, Introduction to Programming for Teachers, and two to five additional modules based on future district needs analyses. Some of these modules will form the basis of the content modules for CS educators; others will be offered as part of specializations. Like the other MLFTC

modules, in-service teachers will have the opportunity to earn micro-credentials in these CS topics.

**I.B.2. Increasing the focus on STEM-CS in recruitment and support.** Having a robust set of STEM-CS offerings matters only if there are students who want to enroll in these programs. MLFTC lacks a specific CS concentration in its STEM programs. As described above, we will create additional offerings in CS and will specifically recruit and retain prospective teachers in these fields to complete the STEM-CS program.

Current recruitment activities focus on broad recruiting across the state of Arizona. We have partnered with the College of Liberal Arts and Sciences (CLAS) to co-develop and market secondary education programs with CLAS in mathematics and science. We have developed plans with the Ira A. Fulton Schools of Engineering (IAFSE) to create a similar program with their faculty to increase the technology and engineering content in our offerings at both the elementary and secondary levels. Increased marketing efforts with IAFSE will allow us to connect with more undergraduate students and encourage them to enroll or co-enroll in our programs. Beyond these partnerships within ASU, we will continue and improve our strategic recruitment of high school students through partnerships with programs like Educators Rising and Future Teachers of America. Through REW, we will pursue clinical placement experiences within STEM-CS environments, such as the Phoenix Union High School District Coding Academy, and offer these clinical placements as early as the freshman year in our program.

**I.C. Competitive Preference Priority 2 – Promoting Effective Instruction in Classrooms and Schools**

REW will promote effective instruction in classrooms and schools in two ways. First, we will intentionally build the knowledge, skills, and dispositions needed to effectively teach in 21st century learning models (e.g., digital learning spaces, blended classrooms). Second, we will

focus on recruitment and retention of effective, diverse educators, by including undergraduates that represent the diverse demographics of K-12 students in schools in Arizona and nationwide.

**I.C.1. Promoting effective instruction in 21st Century learning spaces.** In the last ten years, educational learning environments have radically changed, but most teacher preparation programs have not responded to these new instructional models. For example, districts across Arizona are implementing blended instructional models, and ASU Prep Digital is a nationally recognized, all-digital charter high school. MLFTC provides little instruction to our prospective teachers around these modalities, so, graduates from MLFTC would not be prepared to teach in these contexts.

In our reimagined modules and specializations, we will equip graduates with the knowledge, skills, and dispositions required to effectively teach in innovative 21st century learning environments. Specifically, we will build and offer modules on the following topics for both prospective teachers and in-service teachers: Competency-Based Instruction, Teaching in a Blended Instructional Model, Project-Based Learning in Digital Learning Spaces, Teaching in an All-Digital Setting, and Teaching Online. Additionally, we will ensure that there are robust clinical placements in 21st century learning spaces. We already have interest and commitments from our partner districts to create new roles for prospective teachers interested in working in these areas.

**I.C.2. Strategically increasing educator diversity.** In line with ASU's Charter, specifically the university's efforts to increase inclusivity, MLFTC employs broad recruitment strategies across all sectors of Arizona and beyond. Some notable aspects that support increased diversity in our teacher preparation programs include the Arizona Teachers Academy (ATA) and partnerships with community colleges. The ATA provides full scholarships for up to two years

of study with a commitment to teach in a high-need school following graduation. Partnerships with community colleges, such as Eastern Arizona College (Safford, AZ) and Arizona Western College (Yuma, AZ), allow us to offer our four-year degrees at their locations at discounted tuition rates. In many instances, tuition at these partner sites can be covered entirely by Pell grants. Both of these efforts help low-income college students gain access to our degree programs.

These existing efforts to increase teacher diversity will be augmented by REW through the strategic changes to clinical placement and coursework described above. These recruitment strategies will target individuals from underrepresented programs, individuals to teach in rural communities and teacher shortage areas, mid-career professionals from other occupations, former military personnel, and recent college graduates with a record of academic distinction.

## **II. QUALITY OF PROJECT SERVICES**

### **II.A. The extent to which the services to be provided by the proposed project involve the collaboration of appropriate partners for maximizing the effectiveness of project services**

We have aligned REW with similar activities taking place at the local, state, national, and international levels.

**II.A.1. District and LEA partnerships.** MLFTC has established relationships with 100 public school districts and places approximately 1,050 prospective teachers in 455 Arizona school sites each year. This equates to MLFTC students learning from 1,350 highly-qualified, in-service teachers and impacting more than 24,000 students annually. MLFTC engages its LEA partners in brainstorming and design sessions related to program changes at the college. For example, senior leadership of MLFTC hosted a convening in June 2017 for local education leaders, including superintendents, policy makers, non-profit education agencies, and government agencies, with the express purpose of exploring ideas to invent a new educator

workforce. In October 2017, MLFTC hosted a national convening of education preparation institutions, school districts, and others to extend the conversation and develop a map for moving forward with a new model not only for educator preparation but for a larger workforce continuum, including part-time and full-time roles for people who want to become more engaged in education. Since that time, we have hosted monthly meetings to continue conversations and build models for developing a new educator workforce for Arizona. More than 30 districts, 15 community organizations, and five teacher preparation institutions have expressed interest in our work. These meetings carry on the tradition of informing and guiding refinement of the current iTeachAZ program, which was developed via the TQP-funded PDS NEXT grant (2009; Award U336S090087).

For REW, MLFTC will partner with 18 school districts, all of which are high-need LEAs, and 65 high-need schools within those districts (see Appendix D for checklists, Appendix J for supporting data, and Appendix I for letters of support). All partner districts have been participating in ongoing planning and engagement conversations with MLFTC and are therefore aware of the current initiatives at the college. These LEAs and schools were invited to partner based on a needs assessment (see Appendix C) of our partners with respect to the preparation, ongoing professional development, and retention of effective teachers.

**II.A.2. Office of the Maricopa County School Superintendent.** MLFTC has an existing relationship with the Office of the Maricopa County School Superintendent (OMCSS; see letter of support in Appendix I), which is statutorily responsible to provide services supporting school governing board elections, bond and override elections, appointments, and school finance, and maintain homeschool and private school records in Maricopa County.

MLFTC will consult with the OMCSS to discuss common interests and share objectives and strategies to achieve common and complementary goals.

**II.A.3. Arizona Department of Education.** MLFTC already works with the Arizona Department of Education (ADE) to achieve state-level certification for all undergraduate teacher preparation programs. The certification review process considers both alignment of the teacher preparation program with InTASC standards as well as how the programs address student academic achievement and content standards. ADE recently introduced a menu of assessments for measuring student academic achievement (2018), which affords increased flexibility for schools and districts and will be reflected in the professional learning opportunities developed by REW. Beyond collaboration for certification and compliance, MLFTC faculty and staff routinely participate on ADE committees, boards, task-forces, and other initiatives focused on ensuring that Arizona educators are well-prepared, highly-qualified, and committed to improving all students' academic achievement. Finally, this active and reciprocal relationship with ADE also provides MLFTC with access to the following datasets: teacher characteristics (e.g., demographics, years of experience, types of certification), student characteristics (e.g., demographics, attendance, service indicators such as SPED, ELL, or Title 1), student achievement (e.g., Stanford 10, AzMERIT, AZELLA), and school level reporting (e.g., October Enrollments, Graduation/Dropout Rates, AMO reports).

**II.A.4. Education advocacy organizations.** MLFTC has existing working relationships with multiple local education support organizations. For example, the Center for the Future of Arizona (CFA), a non-profit “do tank” focused on achieving *The Arizona We Want*, engages hundreds of local, state, and national partners to advance initiatives in eight focus areas. Its work in education spans early childhood through post-secondary and adult populations. CFA was

founded by former ASU President Lattie F. Coor, and includes current ASU leadership on both its board of directors and advisory board. MLFTC will consult with CFA for feedback on the project's progress, activities, partnerships, and other common interests (see letter of support in Appendix I).

Nationally, Carole Basile, the Dean of MLFTC, is a member of Deans for Impact. MLFTC is currently participating in the "common indicators" project that is assessing the knowledge, skills, and dispositions of educator candidates across multiple institutions. We have also engaged partners such as Public Impact, Bloomboard, Center for Quality Teaching, and others also thinking about the education workforce more broadly.

Internationally, we have been asked to join the Education Workforce Initiative, a new effort to involve international experts and key stakeholders, researchers, and other partners to examine the education workforce worldwide and especially in developing countries where shortages are extensive (Education Commission, 2018).

**II.A.5. MLFTC internal partnerships.** Internal to the college, there are currently two federally-funded projects that align with the scope and focus of REW. First, MLFTC is home to *Integrating STEM, Literacy, and Language to Prepare All Teachers to Teach English Language Learners (iTeachELLs)*, a TQP-funded project (2014; Award U336S140080) that is focused on integrating strategies to promote English language development and literacy skill development in coursework for prospective teachers. The overall purpose is to ensure that teachers are prepared to effectively work with culturally and linguistically diverse learners, P-12 students who are limited English proficient in particular, through three innovations: instructional coaching, six principles of ELL instruction, and problem-based enhanced language learning. The iTeachELLs project will last five years, involve 20 school districts, 31 partner schools, and 1,500 prospective

teachers (teaching 17,000 P-12 students), and provide post-graduation support through induction programming focused on the program innovations. REW will build off of this work, coordinating with iTeachELL's leadership to develop materials and coursework to address challenges faced by ELL teachers and K-12 students.

Second, MLFTC was recently awarded a National Science Foundation Noyce Scholars Award for *Developing Resilient STEM Teachers for High-Need Middle Schools* (2018; Award 1758368). The Noyce project will last five years, prepare 24 Master's-level math and science teacher leaders, and provide three years of in-service support in engineering curriculum and instructional delivery, as well as leadership development through local and statewide teaching networks. The educational opportunities proposed in REW will allow these Noyce Scholars to specialize in additional areas of interest to round out their expertise. The REW team will support Noyce Scholars' program completion by developing materials and coursework that align with needs identified over the course of the Noyce project.

**II.A.6. ASU internal partnerships.** We will partner with ASU's College of Liberal Arts and Sciences (CLAS), Biodesign Institute (BDI), Fulton Schools of Engineering (IAFSE), School of Sustainability (SoS), University Office of Institutional Analysis (UOIA), and University Office of Evaluation and Educational Effectiveness (UOEEE). MLFTC hosts joint-appointed faculty and affiliated faculty with these four colleges and schools, including: James Blasingame (affiliated from CLAS, English education); Marilyn Carlson, Mary Cavanaugh, Carole Greenes, James Middleton, and Patrick Thompson (affiliated from CLAS, mathematics education); Lauren Harris (joint with CLAS, history education); Yi Zheng (joint with CLAS, educational assessment); Leland Hartwell (joint with BDI, science education); Eileen Merritt (affiliated with BDI, science education); Brian Nelson (joint with IAFSE, computer science

education); Shawn Jordan and Jennifer Bekki (affiliated from IAFSE, science and engineering education); and Leanna Archambault (affiliated with SoS, educational technology). In addition, CLAS has already worked with MLFTC to create dual degrees that lead to teacher certification in several areas, including and most importantly those in the STEM disciplines (see letter of support in Appendix I).

The UOIA provides high quality university information and support for decision-making, planning, and reporting needs within the ASU community. UOIA strives to provide timely and accurate data to meet the needs of all internal and external requesters; to utilize technology for efficient, innovative delivery of our products and services; and to support partnerships and initiatives focused on the improvement of higher education. UOIA already collaborates with MLFTC for institutional reporting and internal program assessment.

The UOEEE will collaborate with REW in two ways. First, the UOEEE is responsible for educational effectiveness monitoring and reporting for ASU. They administer course evaluations, alumni surveys, freshman surveys, faculty evaluations, and program evaluations, all of which contribute to institutional assessment and accreditation. They provide these data to colleges to support undergraduate and graduate student success and assist with program development and revision. Second, UOEEE also offers contracted external evaluation services for sponsored projects at ASU. As a unit of the Provost's Office, detached from all colleges and schools, UOEEE serves as an independent evaluation group within the university.

**II.B. The extent to which the services to be provided by the proposed project reflect up-to-date knowledge from research and effective practice**

A large body of research (e.g., Darling-Hammond, & Luczak, 2005; Ingersoll & May, 2012; Loeb, Darling-Hammond & Luczak, 2005) chronicles the reasons teachers leave the profession, such as job dissatisfaction and a lack of support; other scholars have investigated

why high-potential individuals never enter the profession in the first place (Auguste, Kihn, Miller, 2010). There is also growing evidence to suggest that younger employees are not staying in any profession as long as their parents did (Patel, 2017; Waikar, A., Sweet, T., & Morgan, Y., 2016). Together, these data prompt the fundamental question of whether our systems, beliefs, and outcomes have been organized against an inevitability: we will never fill every American classroom with a teacher if we do not address teacher preparation as a factor in the shortage.

The field of education has realized that not all K-12 students require the same instructional support, which has resulted in an exponential increase in expectations for teachers. A certified teacher in Arizona is expected to demonstrate mastery of 174 separate competencies, spanning multiple content areas, learning styles and strategies, assessment, professionalism, and ethics. These are impossible demands and reflect attempts to integrate personalized learning into a system that is not designed to deliver it well. The college recognizes the limitations of the inflexible and outdated one-teacher-one-classroom model. The ways that schools are staffed must be reconsidered, which necessitates revisiting the pipeline for bringing new teachers into the profession (Wolfenden, Buckler, Santos, & Mittelmeier, 2018).

In response, MLFTC is changing teacher preparation to a flexible, team-based approach with multiple adults working in concert to meet the personalized needs of each student (Barrett & Arnett, 2018). Redesigning teacher preparation will provide a more qualified and more sustainable workforce that is prepared to work in collaboration and partnership with teams of qualified professionals who can address individual learning needs. In this new model, being an educator becomes more manageable, attractive, and differentiated, and will ultimately empower educators to even more dramatically improve outcomes for K-12 students.

**II.C. The extent to which the training or professional development services to be provided by the proposed project are of sufficient quality, intensity, and duration to lead to improvements in practice among the recipients of those services**

REW and its many partners will enhance the existing iTeachAZ clinical teacher preparation program at MLFTC, which was specifically designed to produce well-prepared teachers through a one-year collaborative residency embedded in local districts.

**II.C.1. The iTeachAZ model.** There are five key components of the iTeachAZ model: (1) integrating theory and practice; (2) applying a co-teaching model; (3) on-site supervision by MLFTC faculty; (4) emphasizing student achievement; and (5) building professional partnerships. During the current iTeachAZ one-year clinical experience, prospective teachers fully integrate coursework while co-teaching in a classroom at a partner school with a dedicated mentor teacher. The mentor teacher and prospective teacher partner to plan and deliver academic content in a variety of formats over the course of the academic year. In addition, a district-embedded MLFTC faculty member ensures that each prospective teacher receives sufficient support to complete the residency successfully and progresses through the program as planned. This faculty member also serves as a liaison between the local school and the university to ensure that everyone is served fully by the partnership. All of these program aspects combine to ensure that prospective teachers demonstrate a high record of success during their year-long clinical residency.

Prospective teachers benefit from frequent, focused feedback throughout the program using a research-based rubric to evaluate their knowledge, skills, and dispositions as a teacher. Evaluations are coupled with feedback sessions to debrief the evaluations and plan for follow-up on the prospective teacher's planned changes. A focus on student achievement is paramount in the development of well-prepared and highly-qualified teachers, so achievement data from K-12

students is consistently included in the analysis and planning when prospective teachers work with both mentor teachers and MLFTC faculty. Finally, collaborative supervision and mentoring are hallmarks of the program – MLFTC faculty, mentor teachers, district specialists, and administrators work together to prepare graduates to not only meet Arizona certification and licensing requirements, but more importantly, be effective teachers.

MLFTC has ongoing partnerships with 20 Arizona LEAs that are either fully classified as high-needs or include high-needs schools. Some have STEM academies or have implemented one-to-one computing. Most of the LEAs and their schools have significant populations of SPED students or students who are limited English proficient. These existing partnerships are clearly well-aligned to the priorities of the TQP program. They also position MLFTC very well to build upon the rigor and innovation first developed through iTeachAZ and enhance the current program to meet the needs of prospective teachers – the education workforce of the 21st century.

Our curricular reforms and residency model will continue to fulfill our collaboration expectations with partner LEAs, which will in turn impact local and state systems in the areas of teaching, learning, and assessment. The program developed through REW will be designed in such a way that it can be scaled locally, regionally, or nationally. As the largest teacher preparation program in the state of Arizona, MLFTC graduates more than 600 teachers per year with a 94% pass rate on the Arizona certification exam (E. Mitchell, personal communication, 2018). Given the nature of the specializations being developed and the need to phase-in content over time, not all prospective teachers will participate in the project every year. Thus, over the course of the five year project, we anticipate 1,500 prospective teachers (approximately 50% of total graduates) will participate and graduate from the REW-enhanced iTeachAZ program. Furthermore, we expect approximately 3,000 program graduates and in-service teachers at

partner LEAs will participate in our induction programming and professional development offerings over the course of the grant.

**II.C.3. Preparation to teach special education students and students who are limited English proficient.** All prospective teachers complete standard coursework in SPED. In addition to core courses, prospective Elementary Education (grades K-8) teachers take two additional special education courses – Quality Practices in the Collaborative Classroom and Behavior Strategies. The first focuses on the knowledge, skills and strategies for tailored inclusive practices; collaborative partnerships with special educators; and team-based development of Individual Education Plans (IEPs) for early childhood and elementary classrooms. The second focuses on behavior analysis and classroom management intervention, as well as consultation strategies in general and special education settings.

As these two courses are taken alongside clinical experiences, prospective early childhood and elementary teachers also are able to develop differentiated lesson plans, design systems of positive behavior supports, and develop functional behavior analyses and behavior support plans. Prospective teachers immediately enact and evaluate the efficacy of their products. Secondary Education (grades 7-12) prospective teachers also enroll in an additional SPED course, including Inclusion Practices at the Secondary Level, which requires prospective teachers to complete activities focused on universal design for learning, inclusive practice strategies, and participation in IEP teams. Prospective teachers develop an IEP and implement the plan in the clinical experience classroom.

In 2016-17, the ADE reported that there were 83,500 English Language Learners (ELLs) in Arizona (i.e., 7% of Arizona students overall, with 16% of ELLs in Kindergarten and 1% in 12th grade). Therefore, teachers in Arizona must

be prepared to engage in purposeful and thoughtful partnerships with colleagues and students' families, especially when working with colleagues with professional and personal backgrounds different from their own. REW will prepare teachers to focus on the outcomes of all learners and consider how to best prepare teachers to understand the educational policies and practices required to work with culturally and linguistically diverse learners, including students with disabilities. It is imperative to frame collaboration efforts around students' needs, and to consider that each student is situated within a context that is not just the classroom and school, but also a family, community, and the Arizona socio-political environment at large.

Undergraduates majoring in Bilingual/English as a Second Language (BLE/ESL) Elementary Education (grades K-8) take several courses that focus on developing teachers for linguistically and culturally diverse settings. Prospective teachers in this program are prepared to nurture and develop languages other than English in dual language settings as well as value the rich linguistic resources that are present in any classroom to support student learning. These courses include Language Diversity in Classrooms, Diversity in Families and Communities in Multicultural Settings, and Principles of Language Minority Education. Understanding the challenges that ELLs face instructionally coupled with understanding the implications of language policy in various learning contexts is imperative to student experiences and course work. Prospective teachers learn processes for identifying ELLs as well as developing and supporting the needs of students with Individual Language Learning Plans (ILLPs).

Clinically embedded experiences in diverse dual language settings (i.e., Structured English Immersion, English Language Development, and/or Dual Language) are provided within the BLE/ESL program. During this time, students intentionally and directly implement course learning and theory to practices in the classroom. Strategies within the BLE/ESL program focus

on foundations of second language acquisition, biliteracy, culturally relevant pedagogy, effective language instruction, as well as delivering core curriculum to ELL students (e.g., Science Curriculum, Instruction and Assessment in BLE/ESL Settings). These courses prepare prospective teachers to develop critical perspectives that allow them to advocate for bilingual children and families.

Prospective teachers and in-service teachers seeking a specialization in ELL through REW will be able to choose from the following modules: Language and Literacy Development (essential components of reading instruction); Metacognitive and Metalinguistic Awareness in Second Language Acquisition; Curriculum and Discipline-specific Practices for Language Development and Conceptual Understanding; ELL Instructional Frameworks; and Diagnostic Tools and Formative Assessment Practices for ELLs.

**II.C.4. High-quality induction during the first two years of teaching.** Given the competency-based nature of the program, MLFTC will have a clear sense of the modules in which recent graduates are strong and where they might need additional opportunities to enhance their knowledge or skills. This knowledge will directly inform the development of induction programming. Furthermore, district partners will report some of the needed enhancements to knowledge and skills. Because many of the essentials from our modules will be delivered asynchronously online, district partners can allow all novice teachers, not just ASU graduates, to access the content. Additionally, once novices have demonstrated mastery of the essentials, they can pursue specializations to deepen the expertise in topics relevant to their particular context or professional goals. In this way, the modules allow prospective teachers to create personalized degree programs, but also allow novice teachers opportunities to strengthen and further specialize their practice during the induction period.

In addition, mentors (i.e., MLFTC faculty and district in-service teachers) will collaborate to support novice teachers' development during induction. MLFTC faculty assigned (as part of their regular teaching workload or in replacement of a regularly-assigned course [release time]) and district in-service teachers (paid stipends to participate in additional duties) will deliver induction programming and engage in a variety of supportive coaching activities, such as video-based coaching, real-time video coaching, and face-to-face observation/coaching. Faculty will leverage digital tools to deliver supports that accompany and strengthen learning from the modules. The district mentor teachers will assist novice teachers in bridging theory and practice by helping them apply the module content in daily teaching activities. To round out the MLFTC support experience, MLFTC faculty will support district mentor teachers to develop or enhance their coaching and mentorship skills through leadership training. The REW project team will gather data from the induction programs, such as graduate performance, mentor feedback, and satisfaction, to continually improve, evaluate and assess the effectiveness of induction programming.

**II.C.4. In-service professional development strategies and activities.** Supporting in-service professional development is central to the concept of specializations. In a concerted effort to not simply cover topics, MLFTC has created a set of specializations that grew out of a needs analysis conducted of district leaders. These specializations, which include topics like Data Literacy, Digital Learning, Essential Components of Reading Instruction, STEM-CS, and Teacher Leadership, are designed with flexibility to meet the particular priorities of a district. For example, a specialization in Digital Learning may contain as many as seven to ten learning modules, but the in-service teacher will only need to provide evidence associated with three to four to earn this specialization. A district that is implementing blended learning may choose to

include a specific module in a specialization, whereas another district that is going all-digital would pass on that module and replace it with one that is more relevant. This flexibility allows educators and district leadership to further specialize to align specific goals. More about modules and specializations is included in the following section.

### **III. QUALITY OF THE PROJECT DESIGN**

REW is reimagining how MLFTC prepares the education workforce through clinical placement, coursework, programs, continued professional learning (CPL), and educational systems.

#### **III.A. Reimagining clinical placement**

A hallmark of the iTeachAZ model is the robust, senior year residency, where prospective teachers spend the full, final year of their program embedded in a classroom with a district mentor teacher. During the current residency model, prospective teachers continue with a full load of university coursework. While this is a strong model, it has its challenges. The current iTeachAZ placement process limits undergraduate students to clinical experiences in a single district, which often means prospective teachers spend their entire year-long clinical experience in a single classroom. This model limits opportunities to observe and collaborate in a range of settings and obtain feedback from a variety of perspectives.

The timing of the program is also a challenge. Clinical experiences are often the most revelatory experience, and by focusing the clinical experiences within the residency that occurs during final two semesters of the program, prospective teachers lack opportunities to make meaningful connections between theory and practice throughout the program. Inspired by the strengths of our current clinical placement model and ready to resolve its challenges, we are proposing fundamental shifts in the ways our prospective teachers experience the clinical setting.

Finally, there are some individual-level challenges. The quality of a prospective teacher's residency experience is tied to the quality of the mentor teacher (e.g., effectiveness in specific areas) and the ease with which the prospective teacher and mentor teacher can work together (e.g., personality "fit", philosophical match). The structure also makes it extremely difficult – or even entirely prohibitive – for prospective teachers who have other important responsibilities, like providing for themselves financially or raising a family. These unintended consequences have narrowed the pool of prospective teachers who can successfully complete this model.

**III.A.1. Earlier and ongoing clinical experiences.** Robust clinical experiences will start even earlier for our prospective teachers, as early as their freshman year. These experiences will be appropriate to their learning phase and knowledge base and be closely aligned with coursework in order to simultaneously support skill-development and theory-practice connections. Central to the success of these clinical experiences is our coordination with district and school partners with whom we will co-construct appropriate, authentic roles for our prospective teachers that will allow them to develop into competent teachers over the course of the program, and also meaningfully contribute to the growth and achievement of K-12 learners.

Having prospective teachers with more authentic teaching experience, earlier in our program, enables us to encourage our district partners to offer paid positions in the senior year to ease the financial burden of a full year of clinical experiences for prospective teachers. We are conducting a pilot of this program, called the *Collective Teaching Team* (CTT) model, with two partner districts starting in fall 2018. In the first district, each CTT will include a group of licensed teachers and non-licensed educational professionals (i.e., MLFTC prospective teachers) collectively teaching a large group of students. Currently, among the five first-grade classrooms in the first pilot district, there are four licensed teachers and one long-term substitute with little to

no expertise in education. During the CTT pilot, the substitute will be replaced by three prospective teachers completing their residency year under the supervision of the licensed teachers. The licensed teachers assume responsibility for two classroom rosters and guides, as well as work alongside the prospective teachers to meet the needs of roughly 50 first grade students. Approximately 35 prospective teachers will participate in this model and be paid as employees of the district for the entire year. Salaries will be reallocated to compensate the licensed teachers for their additional duties, who will distribute roles typically played by single teachers in individual classrooms across the four-person team.

The second district will involve two prospective teachers and one licensed teacher collaborating to serve the needs of two class rosters of students, again approximately 50 students. Distribution of roles and responsibilities will be managed by the licensed teacher. Again, prospective teachers will be paid employees of the district, and the licensed teacher will earn a stipend for managing and mentoring the prospective teachers. We anticipate that 17 prospective teachers will participate in this second model. In both pilot models, the CTT will employ co-teaching strategies where the licensed teacher supports each prospective teacher in acquiring the needed experience to contribute to a teaching team while focusing on the essential instructional strategies necessary to enhance outcomes for K-12 students.

Authentic clinical experiences across the program, such as CTT, will be aligned with the state requirements for certification to ensure that field experience hours are met (or exceeded) during the course of the program. Not only will early and ongoing experiences provide opportunities to connect theory and practice, they will allow prospective teachers to identify earlier in their program what specific grade-band, content area(s), and/or learning environments best match their expectations for their future career.

**III.A.2. Clinical experiences in a variety of settings.** REW will offer clinical experiences in a variety of education settings. Diversifying our placement sites will enable prospective teachers to experience a wide variety of educational contexts, including traditional public schools, charter schools, private schools, after-school programs (e.g., tutoring, camps), criminal justice-related settings (e.g., alternative schools), and digitally-rich environments (e.g., blended classrooms, all-digital classrooms with local facilitation). We will convert iTeachAZ's current district-focused model to a regional model, affording prospective teachers experiences in a variety of settings across their entire program. The focus on Title 1, high-risk, high-diversity, high-need partners will continue, and our prospective teachers will be intentionally and strategically placed to provide a heterogeneous set of experiences during their degree program. In addition, the local focus of our program often results in prospective teachers being hired in the same district where they completed clinical experience(s).

Increasing the variety of settings for clinical experiences will enable opportunities to enhance enrollment in teacher education programs. For example, some clinical experiences will include prospective teachers developing mentoring relationships with K-12 students in groups like Educators Rising to entice enrollment and participation in our revised iTeachAZ program.

Finally, having diversity of placement sites is not enough; placements must also be of high quality. Gauging the quality of the learning environments in which prospective teachers will work will be conducted with a new tool – the Effective Learning Environments Observation Tool (eleot<sup>®</sup>; AdvancED, n.d.a., see Appendix J). The eleot<sup>®</sup> has good face and content validity and scores are relatively consistent across subject areas. The measure has strong reliability ( $\alpha=.94$ ) and the factors clustered well (RMSEA = .068), indicating a good match between the theoretical and actual structures (AdvancED, n.d.b). The addition of evaluation of school and system quality

will further enhance and improve the effectiveness of our model in preparing prospective teachers to enter the workforce ready for its complexities and challenges. This and other data from the clinical experiences (e.g., prospective teacher rubric scores and observations) will be used for ongoing program analysis to improve, evaluate, and assess the experience and progress of our prospective teachers.

**III.A.3. Shift from the one-to-one mentorship model.** We will gradually move away from the traditional one-mentor-one-prospective teacher model, both within the senior residency and throughout early clinical experiences. Our program has experienced great success recruiting and maintaining mentor teachers with our district partners; however, in order to scale our new model with consistently high quality, we need to rethink the one-to-one mentorship model. Some mentors are better at some parts of teaching than others, so varied clinical placement experiences will play to mentors' strengths, rather than expecting all mentors to model excellence in all areas. Mentors will need new professional learning, to work in teams to support the success of prospective teachers, and as a result, K-12 students. The diverse mentor-prospective teacher relationships will lead to a team-based system for evaluation, feedback, and coaching.

We will develop a set of essential experiences for prospective teachers, such as running guided reading groups, planning and implementing specific content units (single content and interdisciplinary), creating and implementing a parent engagement strategy, analyzing academic data, and creating a re-teaching plan. All of these experiences will be authentic and will draw upon the expertise of a team (similar to the current professional learning communities [PLC] model or departmentalized teams in schools), but will not necessarily need to be a semester or year long. Experiences can be coordinated within a semester or year to provide a well-rounded, both broad and deep, set of clinical experiences.

### III.B. Reimagining coursework and programs.

Changing our clinical placements demands a more flexible, personalized learning path. Most notably, many of our traditional three-credit, semester-based courses will be redesigned into smaller learning modules. The benefits of this fundamental reengineering of our programmatic structure include (1) better alignment between coursework and clinical experiences; (2) more opportunities for the prospective teacher to personalize his or her learning; and (3) opportunities for prospective teachers with more experience (e.g., one who was a classroom aide for several years) to demonstrate competency in advance (rather than repeat their learning experience). Each learning module will sit within a larger framework of learning clusters. **Table 1** outlines potential learning clusters and associated modules that will be developed. We will have multiple content developers for these modules. Those not included in the budget will be supported by cost share funds.

**Table 1.** REW Outline of Possible Learning Clusters and Associated Modules

<b>Learning Cluster</b>	<b>Brief Description</b>	<b>Potential Modules</b>
Content Knowledge / Pedagogical Content Knowledge	Understand the content and how to best teach it	Pedagogical Content Knowledge; Basic Interdisciplinary Content Knowledge; Specific Content Knowledge; Enculturating Professional Growth; Integrating Innovative Practices; Standards-driven Knowledge; Culturally Sustaining Pedagogy; Learning Theories and Origin of Knowledge  <i>Disciplinary Specializations:</i> Science; Instructional Technology; Mathematics; English/Language Arts (Reading); Computer Science
Cultivating Relationships	Foster and maintain effective relationships built on trust	Building Relationships of Trust; Effective Communication; Character Driven Interactions; Share Knowledge & Expertise
Data Literacy	Collect, analyze, and synthesize data to inform decisions	Multiple Forms & Styles of Data; Privacy & Ethical Uses; Analytic Techniques & Synthesis; Communication of Data; Data Collection Methods; Data Analysis; Data Use in Decision Making; Continuous Data Use
Education Systems	Understand the role of education and the importance of context within various education systems	Current & Historic Systems; Purposes of Education; Global Systems of Education; Current & Historic Policies & Laws; Inform & Improve Policy

Equity	Pursue and encourage equity within education	Awareness of One's Own Socio-cultural Identity; Asset Perspective; Knowledge of Socio-culturally Sustaining Systems & Practices; Restorative Justice
English Language Learners	Address the unique needs of students with limited English proficiency	Language and Literacy Development (essential components of reading instruction); Metacognitive and Metalinguistic Awareness in Second Language Acquisition; Curriculum and Discipline-specific Practices for Language Development and Conceptual Understanding; ELL Instructional Frameworks; and Diagnostic Tools and Formative Assessment Practices for ELLs.
Essential Literacy Instruction	Understand literacy (reading and writing) and how to teach it	Literacy Standards; Screening and Assessment Tools and Practices; Individualized Literacy Integrating Literacy across Multiple Subjects
Innovation with Purpose	Apply innovative initiatives to positively impact students	Design Thinking; Character Assets; Character Education; The Act of Intentional Educating about Character; Character Development; Intrapreneurship; Ethics; Change Agents
Instructional Decisions and Implementation	Plan, teach, and reflect on instruction	Planning; Addressing Content Standards in Lesson Planning; Educator Reflection; Data-Driven Decision Making; Lesson Delivery; Teaching in an Online Environment
International Baccalaureate and Advanced Placement	Prepare global thinkers for college and career	Gifted and Talented; Managing Independent Study; Critical Thinking; Global Mindset; Formative Assessment; Testing Strategies
Leadership	Use voice and influence to enhance the lives of others	Styles of Leadership; Advocacy; Community Involvement and Development; Classroom Leadership and Mentoring; Train-the-Trainer
Learning Environment	Create an inclusive space where students are empowered to meet high expectations	Communicating High Expectations; Conceptualizing the Learning Environment; Materials & Resources; Equitable & Inclusive Learning Environments; Collaborative Interactions & Critical Discourse; Planning & Conducting Learning Experiences; Rich, Respectful Learning Experiences & Opportunities; Physical Space; Literacy
Special Education	Address the needs of students with exceptionalities	Integrating Assistive and Instructional Technology within the General Education Curriculum; Building Self-determination Skills through Student Directed IEPs; Universal Design for Learning in Lesson and Unit Planning; Functional Behavior Analysis and Behavior Intervention Plans; Basics of Systematic Instruction and Data Informed Decision Making; Understand Formative Assessment Tools and Data Collection Skills; Transition Planning with Community Partners; Advocacy
Technology Infusion (Learning Technologies)	Relevant use of technology to facilitate or demonstrate learning	Digital Citizenship; Information Literacy; Selection & Alignment; Assistive technology (Augmenting); Personalization; Online Pedagogy; Communication and Collaboration; Instructional Design
The Learner	Understanding the various characteristics that make up a learner	How People Learn; Stance of Community/Cultural Wealth; Readiness to Learn; Understand and Respond to Diverse Learners; English Language Learners; Special Education

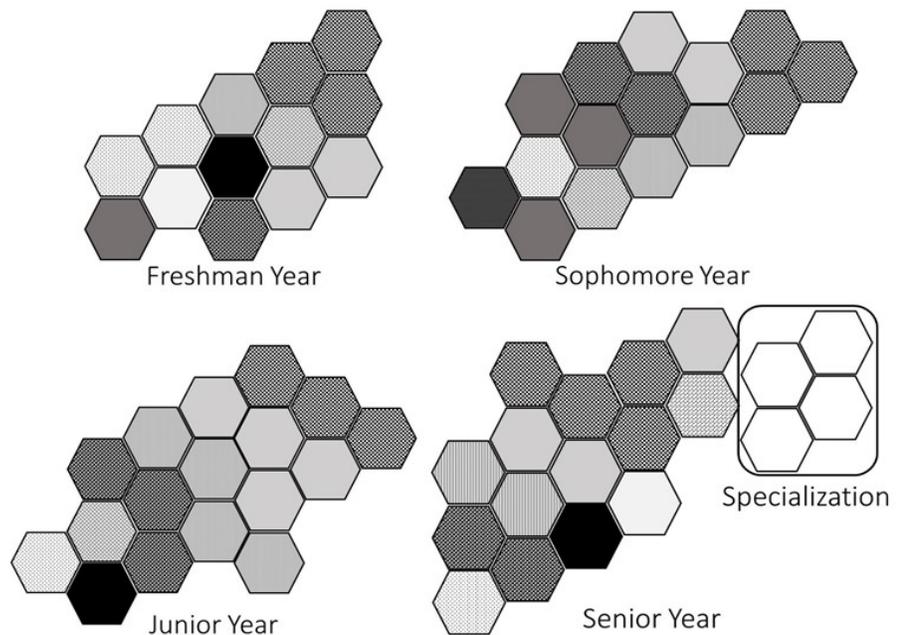
By graduation, prospective teachers will have taken modules in all of these learning clusters. Modules will be aligned with coursework and clinical experiences, where applicable. Prospective teachers will also have had the chance to earn one or two specializations by completing additional elective modules with deeper and richer content. For example, the learning path for a prospective elementary education teacher specializing in STEM-CS would look like *Figure 1*.

Modules can be used in three ways:

1. *Required and fixed in the program.* For example, all juniors will complete the Data Analysis module as well as modules in Content-Specific Pedagogical Content Knowledge (e.g., ways to introduce fractional

representations in elementary mathematics, strategies for helping students grapple with the conservation of energy in secondary physics).

*Figure 1.* REW learning path for a prospective teacher specializing in STEM-Computer Science (STEM-CS). Each color/pattern represents a different learning cluster.



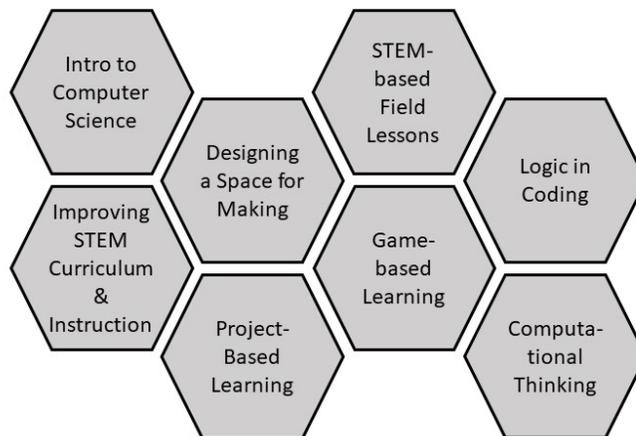
2. *Required, but can be taken at various times in the program.* For example, immediately before and during a clinical placement as a lab facilitator in a secondary coding classroom,

prospective teachers will take Equitable & Inclusive Learning Environments, Pedagogical Content Knowledge in CS Standards, and Content Knowledge for Computer Science.

3. *Specializations.* Within each cluster are elective modules. Prospective teachers may complete these elective modules to develop specialized expertise. These specializations will most often occur in the senior year (as shown in *Figure 1*). *Figure 2* shows an example of the Elementary Education STEM-CS specialization modules. Examples of specializations include STEM-CS (*Figure 2*), Teaching in Digital Environments, Teaching AP and IB Courses, Meeting the Needs of Students on the Autism Spectrum, and Teacher Leadership.

Some concepts may explicitly occur only once in the teacher preparation program (e.g., Purposes of Education, Communicating High Expectations). Others are not compartmentalized into a single cluster or module, but spiral through a program to allow for iterative, deeper learning (e.g., Data-Driven Practices and Instructional Planning).

*Figure 2.* Modules within the STEM-CS specialization. Prospective teachers would complete 4-5 modules to earn a specialization.



### III.C. Reimagining continued professional learning

Most colleges of education race to cover a staggering number of competencies – all undeniably important – but, realistically, prospective teachers cannot develop true proficiency in all of these areas. As we build programs that more deeply address fewer concepts, we must also expand our induction supports and opportunities for CPL post-graduation.

Upon graduation and securing employment, a teacher could complete additional modules to create a personalized induction plan. The modules described above would be available to all

novice teachers needing induction support for any partner district. Additionally, the modules would be used to enable seasoned teachers to brush-up on skills or create a specialized path to enhance his/her career and in-school leadership opportunities.

We will work with partner districts to customize content to integrate within their existing induction programming. We will provide specialized training to the mentor teachers who attend the programming in support of the recent graduate attendees, allowing mentor teachers to earn a specialization in Teacher Leadership. The topics identified by our district partners will also inform the development of our continuing professional education (CPE) offerings for in-service teachers. Currently, MLFTC offers few CPE opportunities outside of our master's and doctoral degrees. The few offerings we do currently have are grant-funded and not currently part of a college-wide CPE strategy. For example, iTeachELLS offers a summer STEM Camp. Almost 450 mentor and new teachers are registered for the 2018 camp. REW will fold this type of existing professional development into the new college-wide, institutionalized, CPE system designed as part of REW. Furthermore, REW will offer the specializations described above to in-service teachers. These specializations will all have associated evidence-based micro-credentials that will have value and portability across Arizona, and ideally the country.

These professional learning opportunities will either be offered free (non-credentialed) for open-access use, or at a price point that will be much lower than traditional per-credit-hour or within-degree coursework. This system will allow MLFTC to continue offering CPE after the project period and institutionalize it within our college programming.

As part of the needs assessment (see Appendix C) conducted with our partner districts, a diverse group of superintendents were asked, "What topics around professional learning might you be interested in MLFTC creating for in-service educators?" More than 20 topics were

requested, ranging from narrow, content-focused topics like mathematics and standards to more fundamental, relational challenges, such as building trust and communication skills. The topics listed also apply to prospective teachers and novice teachers; they will also be used to guide development of teacher preparation and induction.

### **III.D. Reimagining educational systems**

Not only will the changes to our program better prepare new teachers, but also they are the beginnings of a much larger, systemic change. The job of an educator, as currently configured, is untenable. Communities across the United States are grappling with the “teacher shortage” crisis. Nationwide, it is well-documented that up to half of novice teachers leave the profession within the first five years (Gray, L., & Taie, S. 2015; Ingersoll, 2002). Teacher preparation programs have simultaneously been experiencing declining enrollments. According to a recent report, the country is likely to have a demand for more than 300,000 new teachers by 2020 and have a supply of fewer than 200,000 (Sutcher, Darling-Hammond, & Carver-Thomas, 2016). Further, that same study revealed that nationwide enrollment in education majors decreased 35% from 2009 to 2014, and the number of prospective teachers that completed their program decreased by 23% during the same time period.

Specifically in Arizona in the past decade, enrollment in education majors at Arizona’s three public universities has decreased by almost 20%, which is a stark contrast to trends in other fields of study. Student enrollment in business has increased approximately 50%, and in health and engineering fields, that figure rose by more than 100%. Radical solutions have been proposed, such as Arizona’s recent legislation (Arizona S. 1042, 2017) allowing anyone with a Bachelor’s degree and fingerprint clearance to become the teacher of record without any professional preparation. This type of solution knowingly allows unprepared educators into K-12 classrooms.

We believe there is a different way. Through deep partnerships with districts, we will work toward systems-level change to create learning environments where *teams* of educators come together around groups of students. Our reimagined clinical experience model challenges the traditional one-teacher-one-classroom model, moving to a model where several prospective teachers work with a single mentor teacher as a team to plan, implement, and reflect on instruction. MLFTC is already working with districts and schools to co-design and pilot innovative team-based classroom models designed that simultaneously (1) capitalize on teacher strengths and expertise by distributing the workload (i.e., roles) traditionally assumed by a single teacher among teams of educators; (2) create working conditions that will enable teachers to feel efficacious as they take on these specialized roles; (3) establish, within the specialized role structure, a career ladder for teachers; (4) support the development of MLFTC students studying to be teachers; and (5) create induction and ongoing professional development to support teachers' continuously changing needs during the implementation of the models.

These changes will not happen overnight, but we already have 20 school district partners ready to work with us to create this new model. These partners have been attending monthly meetings on this topic, and six of them will be piloting a version of the program in the 2018-19 academic year (See Appendix I for letters of support). Encouraged by the work of Public Impact and their recent findings working in collaboration with the Christensen Institute (2018), we believe that not only is this team-based approach financially viable and sustainable, but also that it is also better for students' growth and achievement.

### **III.E. The extent to which the proposed project demonstrates a rationale (as defined in 34 CFR 77.1(c))**

Each fundamental aspect of project REW is grounded in relevant research and informed by evidence gathered by MLFTC from partner LEAs, as summarized in the needs assessment (Appendix C) and logic model (Appendix G).

#### **III.E.1. Preparing prospective and novice teachers with strong teaching skills.**

Districts that hire iTeachAZ graduates describe them as distinct from teachers prepared in other programs, stating that their level of experience is similar to that of a second year teacher (Schlesinger, n.d). Some districts explicitly recruit iTeachAZ graduates, even including the question “Are you an iTeachAZ graduate?” in their hiring portal (N. Perry, personal communication, 2015), because they know that iTeachAZ graduates are “...ready to come in and provide high-quality instruction” (U.S. Department of Education, 2014). These are examples of MLFTC’s rich history of preparing prospective teachers with strong teaching skills through iTeachAZ.

REW will build on our history by keeping the best elements of the previous model (e.g., full senior year residency, strong district partnerships, faculty embedded in schools) while also directly addressing several of the challenges identified by prospective teachers and district partners. Specifically, the new model will afford a greater number of clinical experiences that come earlier in the program and encourage depth over breadth.

**III.E.2. Increased clinical experiences starting earlier in the program.** The research is unambiguous on the relationship between clinical experiences and preparing strong teacher. Clinical experiences allow opportunities to access knowledge, apply it, and reflect on the connections between theory, practice, and student learning. Enhancing these connections is a persistent challenge, referred to as the Achilles heel of teacher education (Darling-Hammond,

2009, as cited in Zeichner, 2010). Quality experiences occur in schools and classrooms that have healthy cultures of collegiality and innovation (Grossman, 2010). Creating opportunities to bridge this academic and practical knowledge is imperative (Cochran-Smith & Lytle, 1999; Zeichner, 2010), but certainly not without challenge (Cochran-Smith, 2004). These challenges exist even in teacher preparation programs, like iTeachAZ, with strong university-school partnerships where coursework is embedded in K-12 schools (Zeichner, 2010). While there has been insufficient attention to bridging the theory-practice divide (Bickmore, Smagorinsky, & O'Donnell-Allen, 2005; Britzman, 2003; Cuenca, Schmeichel, Butler, Dinkelman, & Nichols, 2011), evidence suggests coherent and carefully integrated coursework and clinical work has strong positive effects on prospective teachers (Darling-Hammond & Bransford, 2005). Minding both the strengths and challenges associated with clinical experience from the research, we will create meaningful placements in K-12 schools as early as the freshman year.

***III.E.2.a. Teacher educators' role in clinical experiences.*** Within REW, the quality clinical experiences will occur in robust classroom settings where mentor teachers are trained to model and provide feedback. Academic and practitioner knowledge will come together and prospective teachers can reconcile theory and practice. In this way, teacher educators can dismantle the curricular divide between foundations courses and methods courses and highlight the interplay between course content and field experiences (Grossman, Hammerness, & McDonald, 2009; Klein, Taylor, Onore, Strom, & Abrams, 2013) – consequently, prospective teacher efficacy will improve.

***III.E.2.b. Training highly skilled mentors for clinical experiences and early-career support.*** Highly skilled mentors are a cornerstone for quality clinical experiences and early-career support. Prospective teachers and novice teachers alike consider the mentor teacher to be

the most influential factor in learning to teach (Clarke et al., 2014). Despite the significant roles mentors play in the growth of prospective teachers and novice teachers, and the prevalence of mentoring programs in teacher preparation and induction, relatively little attention is on identifying and developing quality mentors.

High caliber teaching practices do not necessarily indicate that a teacher has the skills and knowledge to effectively mentor a prospective teacher (Clarke et al., 2014; Shagrir, 2010). Often, mentoring teachers receive little training in classroom leadership and mentoring, and are thereby left to rely on their own intuition or past experiences as they mentor and support the development of prospective teachers and novice teachers (Clarke, Triggs, & Nielson, 2014). Mentor training is imperative to ensure our prospective teachers receive quality, cohesive, and consistent mentoring during their clinical experiences. In REW, mentor training will take place when in-service district mentor teachers complete professional development modules (e.g., Classroom Leadership and Mentoring) and specializations (e.g., Teacher Leadership).

In addition to promoting quality mentoring to prospective teachers, REW will reduce the divide between graduates' university experience and the support novice teachers receive during their induction years. Induction programs connected to quality teacher preparation have been seen to be “doubly effective” (Darling-Hammond, 2010, Wilson, Darling-Hammond, & Berry, 2001). The professional development offered to teachers in partner districts (e.g., modules on Classroom Leadership and Mentoring) will simultaneously enhance the quality of pre-service mentoring as well as the quality and alignment of in-service mentoring for graduates who become employed in these districts.

**III.E.3. Depth over breadth in clinical experiences.** The second major programmatic change, adopting a less-is-more approach to the curriculum, allows two fundamental shifts to

occur in the way that teachers are learning: (1) teachers have more opportunities to deliberately practice, and (2) concepts can be spiraled and deepened over time. First, deliberate practice, or the opportunity to rehearse and enact lessons with colleagues and experts before teaching K-12 learners, must be high quality and meet characteristics of deliberate practice (Ericsson, 2016). Experts in teacher education recognize high-quality practice as an essential component of teacher preparation programs (Grossman, et. al., 2009; Lampert, et. al., 2013). Second, research from learning science suggests that spaced practice (i.e., waiting enough time between sessions so that “forgetting sets in”) and interleaved practiced (i.e., practicing several skills simultaneously) are associated with stronger internalization of the skills (McDaniel, 2012). Practice, however, takes considerable time to learn to do something well. Therefore, in an effort to create more space for robust, spaced, interleaved practice, the program must prioritize some topics over others. Although these topics should, in part, be influenced by the particular teacher and context in which that teacher is working, research suggests there exist universal, research-based practices applicable across virtually all educational settings (see Darling-Hammond, 2016).

**III.F. The extent to which the goals, objectives and outcomes to be achieved by the proposed project are clearly specified and measurable**

REW’s goals, objectives, outcomes, and measures are aligned to both the required measures for the TQP program (i.e., as required in section 204(1) of the HEA; GPRA measures) and the anticipated growth and accomplishments outlined in this proposal (see **Table 2**). As detailed previously, MLFTC has robust internal data systems for enrolled students. In addition, strong relationships with partner LEAs and ADE will provide access to data for graduates when they enter the workforce. These systems and relationships provide all the information needed to address the evaluation of REW. It is also worth noting that with nearly 2,500 enrolled students,

MLFTC is well-positioned to conduct large-scale, comparative research on effective teacher education.

### **III.G. The extent to which the proposed project is designed to build capacity and yield results that will extend beyond the period of Federal financial assistance**

We have intentionally designed the program to build capacity and yield results that will extend well beyond the period of Federal financial assistance. REW is a fundamental re-imagination of both coursework and clinical experiences. The primary costs associated with this innovative work are up-front and structural, meaning that once the learning experiences and systems are built during the timeframe of the grant, only operational expenses will remain. These expenses, including hosting the open-access, free versions of our content, can and will be covered by prospective teacher tuition and the minimal fees for in-service teachers' completion of modules.

We also believe that REW will yield additional capacity by increasing the undergraduate enrollment in MLFTC. With more flexibility, choices, and clinical experiences in the program, undergraduates will be more likely to matriculate to the college, feel satisfied with the program, and stay until graduation. Additionally, the market of in-service teachers, many of whom are alumni of our program, is relatively untapped. By offering professional learning in the form of specializations that are far less expensive and time intensive than a master's degree, we stand to dramatically increase graduate (non-degree) enrollment. Although we are still in the process of building the complete business model, we will include admissions goals and priorities that are aligned with the hiring objectives of our partner LEAs. Early estimates and market research suggest that specializations could become a major source of revenue for the college – helping us to offset the costs and continue innovating around our prospective teacher and induction programs.

<b>Table 3. REW Project Evaluation Goals, Objectives, and Measures</b>		
<b>Objectives</b>	<b>HEA<sup>1</sup> / GPRA</b>	<b>Annual Measures<sup>2</sup></b>
<b>Goal 1: Increase the number and diversity of graduates of iTeachAZ programs, especially CS and STEM teachers.</b>		
1.1 Implement marketing and recruitment strategies to reach new and/or underserved audiences (e.g., STEM, CS, SPED, ELL, low-income, underrepresented populations).		Portfolio of marketing methods or products; List and number of recruitment events
1.2 Enroll prospective teachers from new and/or underserved populations (e.g., STEM, CS, SPED, ELL, low-income, underrepresented populations).		Disaggregated enrollment and graduation data
1.3 Provide support services for prospective teachers to ensure retention in the program.	GPRA 3	List and count of services provided; Satisfaction with services provided; Enrollment and graduation data
<b>Goal 2: Increase prospective and in-service teachers' preparedness to teach in traditional and non-traditional educational environments.</b>		
2.1 Improve curriculum alignment with diverse educational settings.		Rubric-based evaluation of alignment
2.2 Establish additional clinical placements in diverse educational settings.		Count and type of clinical placement settings
2.3 Establish additional clinical placements for lower-division students.		Count and type of clinical placements available to lower-division students
2.4 Increase prospective teachers participating in clinical experiences each year.		Annual percentage of prospective teachers participating in clinical experiences
2.5 Increase teachers trained to integrate technology effectively into curricula and instruction, including technology consistent with the principles of universal design for learning.	Req. 10(i)	Percentage enrolled in professional learning opportunities (i.e., modules) focused on technology integration and university design for learning
2.7 Increase 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.	Req. 10(ii)	Percentage enrolled in professional learning opportunities (i.e., modules) focused on data literacy
2.8 Increase self-efficacy of prospective and in-service teachers working in diverse educational settings.		Self-efficacy survey; Participant interviews and focus groups

2.9 Increase customization of induction programming held with partner districts.		Count of unique elements of induction available to each partner district; District leadership satisfaction with induction programming
2.10 Increase the pass rates for initial State certification or licensure of teachers.	Req. 3 GPRA 1, 2	AEPA exam pass rates; Graduation rate
2.11 Increase achievement of prospective teachers at MLFTC.	Req. 1	GPA; Academic Probation reports
2.12 Increase scores on the eleot <sup>®</sup> tool for clinical experience environments.		Scores on the eleot <sup>®</sup> tool
<b>Goal 3: Improve program graduates' hiring and retention rates, especially at partner districts and schools.</b>		
3.1 Increase the percentage of program graduates hired by the high-need LEAs participating in the partnership.	Req. 4	Employment data from partner LEAs
3.2 Increase the percentage of teachers hired by the high-need LEAs who are members of underrepresented groups.	Req. 5	Employment data from partner LEAs
3.3 Increase the percentage of teachers hired by the high-need LEAs who teach high-need academic subject areas (e.g., reading, mathematics, science, and foreign language, including less commonly taught languages and critical foreign languages).	Req. 6	Employment data from partner LEAs
3.4 Increase the percentage of teachers hired by the high-need LEAs who teach in high-need areas (including special education, language instruction educational programs for limited English proficient students, and early childhood education).	Req. 7	Employment data from partner LEAs
3.5 Increase the percentage of teachers hired by the high-need LEAs who teach in high-need schools, disaggregated by the elementary school and secondary school levels.	Req. 8	Employment data from partner LEAs
3.6 Increase 1-year teacher retention rates for program graduates at partner districts and schools.	Req. 2 GPRA 4	Employment data from partner LEAs
3.7 Increase 3-year teacher retention rates for program graduates at partner districts and schools.	Req. 2 GPRA 5	Employment data from partner LEAs

1. Requirement 9 (early childhood) does not apply.

2. See Grant Application Form for Project Objectives and Performance Measures Information for performance targets

**III.H. The extent to which the proposed project represents an exceptional approach to the priority or priorities established for this competition.**

To our knowledge, no traditional colleges of education have implemented our comprehensive model: a competency-based, clinically-rich program based in learning modules that allow for personalization and specializations. Some programs, like those at Western Governors University or the Relay Graduate School of Education, offer competency-based programs. Programs like those offered at the University of Michigan or Washington State are clinically rich and prioritize deliberate practice. Others, like University of Arkansas and Purdue, are beginning to experiment with micro-credentials. But no one place, especially one as large and nationally prominent as ASU, has put all of these pieces together. We have relationships with all of these institutions, and we have been, and will continue to be, learning from each of them.

K-12 learning environments are fundamentally changing (e.g., they are becoming competency-based, blended, more personalized, and team-based), and the best way to prepare teachers for these new environments is to model what effective teaching looks like in our own programs. Thus, the success of REW will return the favor to the entire field of educator preparation.

**IV. QUALITY OF THE MANAGEMENT PLAN (25 points)**

**IV.A. The adequacy of the management plan to achieve the objectives of the proposed project on time and within budget, including clearly defined responsibilities, timelines, and milestones for accomplishing project tasks.**

ASU and MLFTC are highly competent in managing projects similar to the proposed REW project. According to the 2018 U.S. News & World Report, ASU is the #1 most innovative school in the country and managed a research portfolio of more than \$545 million in research expenditures in fiscal year 2017. More than 100 companies have been launched based on innovations developed at ASU; these projects were supported by almost \$100 million in funding

during fiscal year 2016. ASU has a well-organized, centralized team of pre- and post-award specialists ready to support the project through the Office of Research and Sponsored Projects Administration. In addition, MLFTC offers support for project implementation through its Research Opportunity Development and Advancement team and Office of Fiscal and Business Services.

**IV.A.1. Key personnel and responsibilities.** The project leadership, outlined in **Table 3** below, are extremely well-qualified and seasoned grant professionals with the skills, abilities, and support necessary to carry out the project successfully. The key personnel were selected to create an accomplished and visionary team to achieve the ambitious goals of the project.

**Table 3.** Key personnel and responsibilities

<b>Key Personnel</b>	
<b>Cynthia (Cyndi) Giorgis (PI)</b>	Professor and the Director of the Division of Teacher Preparation at MLFTC. <b>Responsibilities:</b> Oversee the proposed project and strategic planning; manage team to meet deliverables, milestones, and reporting requirements; maintain communication with all project personnel and stakeholders; participate in all dissemination activities.
<b>Teresa S. Foulger (Co-PI)</b>	Associate Professor and Program Coordinator for Educational Studies at MLFTC. <b>Responsibilities:</b> Ensure project success by translating her experience coordinating the Educational Studies non-certification program to enhancing the teacher preparation program.
<b>Brent Maddin (Co-PI)</b>	Executive Director of Educator Workforce Initiatives at MLFTC. <b>Responsibilities:</b> Oversee the workforce development aspects of the grant, particularly the development and implementation of the new personalized module structure of the program; oversee the instructional design of curriculum with the Office of Online Learning at MLFTC.
<b>Nicole Thompson (Co-PI)</b>	Associate Professor and Associate Director of the Division of Teacher Preparation at MLFTC. Thompson oversees programs, partnerships, and clinical experiences, as well as supports faculty in the process of reimagining educator preparation for a new educator workforce. <b>Responsibilities:</b> Integrate all of the project activities in the enhancement and redesign of iTeachAZ; oversee all content development; ensure alignment with requirements set by the districts, university, and state for certification and professional development.
<b>Andrea Weinberg (Co-PI)</b>	Assistant Professor in Teacher Preparation at MLFTC. <b>Responsibilities:</b> Assist with program implementation in coordination with the Program Manager; assist with induction program development with the Program Manager and Program Coordinator; coordinate with the Office of Data Strategy at MLFTC and external evaluators related to the internal evaluation and associated research goals of the project and college.
<b>Edith Gummer (Co-I)</b>	Executive Director of the Office of Data Strategy at MLFTC. <b>Responsibilities:</b> Manage the data collection, analysis, and reporting; oversee the evaluation and research components of the project in collaboration with Co-PI Weinberg.
<b>Meredith Toth (Co-I)</b>	Assistant Dean of Digital Learning at MLFTC. <b>Responsibilities:</b> Oversee online program development, curriculum and instructional design changes, media development, and analytics for online courses; provide input on use of the redesigned curriculum during the pre-service, induction, and professional development programming.

<b>Content Developers</b>	<p>The following MLFTC faculty will create new or revise existing curriculum for the project, facilitate content delivery and instruction during the project, and make modifications to the curriculum over time.</p> <ul style="list-style-type: none"> <li>● Mildred Boveda, Cultural and linguistic diversity</li> <li>● William deLeeuw, Mathematics education</li> <li>● Bjorg LeSueur, Early childhood education</li> <li>● Sarup Mathur, Special education</li> <li>● Brian Nelson, Educational technology and computer science</li> <li>● Margarita Pivovarova, Economics in education</li> <li>● Kathleen Puckett, Special education</li> <li>● Alexandra Silva, Bilingual education</li> <li>● Molina Walters, Environmental education</li> </ul>
<b>Other Personnel</b>	
<b>Instructional Designers</b>	Two instructional designers will be hired to work with the project leadership, content developers, and instructors on all aspects of the online curriculum design and delivery, including (1) assisting the content developer in the design of engaging interactive and instructionally sound materials that address various learning styles and are accessible to all students; and (2) lending expertise and guidance as needed during the design of materials, including reviewing and suggesting modifications to assignments and materials with the goal of clarifying processes and expectations for student work.
<b>Program Manager</b>	A program manager will be hired to oversee all day-to-day aspects of REW and coordinate with the PI, Co-PIs, and college leadership to (1) oversee communications with the partners, especially the LEAs; (2) work with the post-award team to manage expenditures and budget forecasting; and (3) review feedback from stakeholders (e.g., faculty, student support services, recruitment, mentor teachers) to regularly measure program impact, successes, and opportunities for improvement.
<b>Program Coordinator</b>	A program coordinator will be hired to (1) manage day-to-day communication and coordination with the partners, most specifically the LEAs, and be the primary planner and implementer for the induction and in-service programming at the LEA sites; (2) work with Co-PIs and Co-Is to ensure that new curriculum will be supported by site-based experiences and will be directly relevant to the contexts in which prospective teachers will complete their placements; (3) manage collection of continuous and formative programmatic feedback from stakeholders; and (4) communicate with the external evaluation team regarding analysis and reporting.
<b>Technical Development Programmer</b>	A technical development programmer will be hired to create or customize (1) advanced learning objects (e.g., Articulate) and (2) tools for students and faculty (e.g., progress dashboards, communication tools among multiple faculty and staff working with the same student) during the course of the project.
<b>Data Analyst</b>	A data analyst will be hired to extract, clean, and synthesize data from multiple sources for both reporting and implementation/improvement processes, including module-taking patterns and performances, placement, and retention.
<b>Videographer</b>	A videographer will be hired to film specific instructional instances and moments to include in our learning activities, then work with the instructional designers, technical development programmer, and video editor to produce high-quality instructional videos.
<b>Video Editor</b>	The video editor will work with the instructional designers, technical development programmer, and videographer to edit the classroom-based video to fit within instructional learning objects and activities.

#### **IV.B. The potential for the incorporation of project purposes, activities, or benefits into the ongoing program of the agency or organization at the end of Federal funding**

Similar to the development and implementation of the iTeachAZ program, REW will be fully integrated into the teacher preparation program at MLFTC. The new curriculum and

program structure will eventually replace the existing model for iTeachAZ. All LEA partners (within and outside of the grant) have been advised of these changes and, as mentioned above, a pilot of the changes is already planned with multiple existing LEA partners. Federal funding will be used to develop and implement the plan, and state and local funding will sustain it fully at the conclusion of the funding period.

**IV.B.1. Timeline of activities.** Table 4 outlines the major activities of REW and the period(s) during which they will be accomplished. As mentioned previously, activities are front-loaded due to the focus on program development and institutionalization at the college, ensuring program continuation and financial sustainability after the project period.

**Table 4.** Timeline and activities

Activity	Year 1	Year 2	Year 3	Year 4	Year 5
Targeted recruitment	X	X	X	X	X
Establish additional clinical experiences	X	X	X		
Develop modular learning options	X	X	X		
Create content and pedagogical specializations	X	X			
Customize induction programming with partner districts	X	X			
Develop professional learning opportunities	X	X			
Offer clinical experiences earlier in the program	(Pilot)	X	X	X	X
Provide more diverse clinical experiences	X	X	X	X	X
Provide induction programming		X	X	X	X
Offer professional learning opportunities		X	X	X	X
Refine modules, specializations, induction programming, and professional learning opportunities			X	X	X
<b>Total activities</b>	<b>8</b>	<b>10</b>	<b>8</b>	<b>6</b>	<b>6</b>

**IV.C. The adequacy of support, including facilities, equipment, supplies, and other resources, from the applicant organization or the lead applicant organization.**

As a Tier One doctoral research-intensive institution, ASU has substantial resources available to support the research enterprise. ASU provides a comfortable working environment for project personnel and basic office needs, as well as space and equipment for storage of related project materials. Existing physical resources include meeting spaces, faculty laboratories, and equipment, all of which are adequate to meet various research needs. University

facilities (e.g., university library, online document delivery service, audiovisual department, and fully-equipped computers with the necessary hardware, software, and technical support personnel) are available for use as needed by the research team. ASU has licenses for many statistical packages and programs that offer support for research activities, including SPSS, SAS, data management software, and video-conferencing capacities. In addition, ASU has recently implemented research dissemination resources, such as a dedicated studio for video recording and audio narration using Camtasia software and professional recording equipment, as well as editing and publishing support for publications.

ASU is home to the Mary Lou Fulton Teachers College (MLFTC), a recognized leader and innovator in teacher preparation and educational leadership. As one of the largest, most influential colleges of education in the nation, MLFTC is dedicated to preparing the next generation of education leaders and bringing Arizona's schools and children to the forefront of academic achievement. MLFTC currently has nearly 2,500 undergraduate and graduate students enrolled in its teacher certification programs. Furthermore, approximately half of MLFTC's placement sites are Title I schools, with a majority of their students coming from underserved populations.

MLFTC has classroom and lab space at all four university campuses; however, most of the instruction and learning in the year-long residency program takes place in partner district sites so that prospective teachers can be fully immersed into the culture and learning of schools. Each partner district has a designated iTeachAZ classroom and office for storage of materials, use of technology, and instruction. To facilitate site-based iTeachAZ programs, mathematics and science instructors have created labs and hands-on learning activities that are mobile and can be deployed at the district. The designated classroom at each site can also be used for students to

access university services, such as the Disability Resource Center or the Tillman Veterans Center, through face-to-face or digital meetings.

MLFTC will leverage other activities and funding already in place at the college to ensure the success of the REW project. For example, the cost share budget is primarily comprised of salary for faculty and staff developing the module materials and delivering the instruction over the course of the project. In addition, cost share of external philanthropic funding (i.e., the Kern Family Foundation; see confirmation in Appendix D) for program redesign is also budgeted to support the project. Grant funding will supplement these resources and enhance the teams' abilities to complete the redesign and implementation of the iTeachAZ program efficiently and effectively.

ASU is also home to EdPlus, a central enterprise unit for ASU focused on the design and scalable delivery of digital teaching and learning models to increase student success and reduce barriers to achievement in higher education. EdPlus advances the economic, social, cultural and overall health of the local, national and international communities served by ASU through (1) 150 fully online degree programs; (2) open scale courses; (3) online continuing education; (4) direct partnership with universities and public and private corporations; and (5) deep learning analytics. We will offer some components of REW through ASU EdPlus's Continuing and Professional Education (CPE) unit. EdPlus at ASU approves programs for general continuing education units (CEUs) and awards certificates to individuals. EdPlus uses Acclaim, a platform backed by Pearson, the world's leading education company, to award certifications that communicate a learning achievement or credential. EdPlus also uses Canvas, ASU's campuswide learning management system (LMS). Developed by Instructure, Inc., the Canvas learning management system includes most of the standard tools found in open source and

commercial management systems (assignments, discussions, announcements, quizzes, syllabus, etc.) as well as enhanced tools and features, including real-time web conferencing, a multimedia recorder, Google Docs integration, outcomes and rubrics, and course analytics.

## **V. QUALITY OF THE PROJECT EVALUATION (20 points)**

### **V.A. The extent to which the methods of evaluation will provide valid and reliable performance data on relevant outcomes**

REW will use both internal and external evaluations to collect, analyze, and report on project progress and outcomes.

**V.A.1. Internal evaluation.** Dr. Edith Gummer and MLFTC ODS will manage the internal evaluation. The goals, objectives, and annual measures (**Table 2**) clearly outline the intentions of the project. ASU has a strong business enterprise system that tracks all of the undergraduate student information of prospective teachers. In addition, much of the necessary data for evaluating the progress of prospective teachers is collected through the MLFTC teacher preparation data system. This system includes Tk20, a placement and assessment platform, and the iTeachAZ data dashboard and mobile app. ODS will facilitate “Data Days” with appropriate frequency to have the project team review the data being collected and analyzed.

The iTeachAZ data dashboard is a data visualization platform that we use to track the progression of prospective teachers through the programs, with a focus on the use of instructional and professionalism rubrics. Other data included in the iTeachAZ dashboard are attendance and any notices of concern that can be submitted by the MLFTC faculty, mentor teacher, or district administrator in the clinical placement. Partnerships with LEAs and relationships with other offices, both internal and external, will ensure appropriate data are used to report on the project’s accomplishments. The external evaluation team from UOEEE (see

below) will be invited to review data collection, management, and analysis procedures used to assess accomplishments and progress towards the project goals.

**V.A.2. External Evaluation.** Drs. Shelly Potts and Alison Cook-Davis of the UOEEE will lead the evaluation in cooperation with the PI and the project team. The UOEEE will provide performance monitoring and independent evaluation of the grant activities and outcomes. The UOEEE is uniquely qualified given the team's extensive training, expertise, and experience in monitoring and evaluating higher education programs, including those sponsored by the U.S. Department of Education, National Science Foundation, the National Institutes of Health, and the U.S. Agency for International Development. UOEEE's mixed-method evaluative approach will include both formative and summative components to determine the extent to which the project's annual and overall objectives and outcomes have been met during and at the conclusion of the five-year funding period, gauge the quality and impact of the project's activities, and identify any unintended outcomes. Evaluation services will be comprised of IRB documentation approval, consultation on protocol design, data collection and analysis, document review, and report writing.

The evaluation design includes participants' perspectives and documentation of the project's implementation and impact. The evaluators will employ an iterative approach, such that each year's evaluation results and constructive feedback will be used to provide recommendations for subsequent years' education/outreach activities. The evaluation team will produce annual evaluation reports and a final report at the conclusion of the grant period. In addition to an annual written report, the evaluators will provide ongoing, informal feedback through email, phone calls, and meetings throughout the funding period.

**V.B. The extent to which the methods of evaluation are thorough, feasible, and appropriate to the goals, objectives, and outcomes of the proposed project**

Goal 1, *increase the number and diversity of graduates of iTeachAZ programs, especially CS and STEM teachers*, will be addressed by and monitored in conjunction with the MLFTC marketing and recruitment teams, the Office of Data Strategy (ODS), and the Office of Student Services (OSS). We will create a portfolio of marketing products and descriptions of their event types and activities to demonstrate the variety of approaches taken to meet this goal. ODS collects and analyzes all institutional data (e.g., racial and ethnic demographics, socioeconomic status, first-generation college student status) on prospective teachers. They will report on routine retention analyses. Finally, OSS, which provides academic and general support for all undergraduates enrolled in teacher education programs, will track use of services and measure prospective teachers' satisfaction with the services while in the program. Issues with recruitment and retention will be shared with the project team, who will coordinate with OSS, which is implementing a new process for early identification of student difficulties and more proactive retention support strategies. The ODS will also consider the data that the OSS is collecting to determine how the two complementary data sets might support grant activities more formatively.

Goal 2, *increase prospective and in-service teachers' preparedness to teach in traditional and non-traditional educational environments*, will be managed by the project team and coordinated with the MLFTC Office of Clinical Experiences (OCE), ODS, and OSS. The project team will conduct the rubric-based evaluation of curriculum alignment, administer the self-efficacy survey, conduct participant interviews and focus groups, evaluate induction sites for unique characteristics, communicate with district leadership to obtain satisfaction data, and

administer the eleot® tool at sites. OCE will report on clinical placements; ODS will provide graduation rate data; and OSS will provide GPA, academic probation, and exam pass rates.

Goal 3, *improve program graduates' hiring and retention rates, especially at partner districts and schools*, will be managed by ODS in conjunction with project leadership. ODS will establish data sharing agreements with the partner LEAs to obtain employment data on an annual basis. Participating prospective and in-service teachers will be identified using their state employment identifier, which will be consistent within and across districts, should teachers switch schools during the course of the grant. We will analyze employment data to address aggregate hiring and retention, and to address the specific subgroup characteristics of interest to the Department (i.e., underrepresented groups, high-need subject areas, high-need areas, elementary and secondary levels).

Qualitative data (e.g., interviews, focus groups) will be analyzed using the constant comparative method (Glaser & Strauss, 1967; Strauss & Corbin, 1990). We will conduct multiple rounds of coding until common themes emerge and we can review results to address any necessary formative updates. Quantitative data (e.g., evaluation scores) will be reviewed to determine whether any patterns exist that indicate specific programs, prospective teacher groups, or clinical placement sites need to be further examined.

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