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ABSTRACT

Name of IHE: State University of New York (SUNY) at Fredonia
Title of Program: Project MAST²ER (Mathematics And Science Teacher Training in Educational Resources)
Consortia Partners: Dunkirk City School District
Jamestown City School District

Project Description: Project MAST²ER is a theory-to-practice research-based framework to strengthen mathematics (math) and science teacher education programs through infusing evidence-based practices and data-based decision making in the production of Teacher Work Samples (TWS) that inform instruction. Teacher candidates employ action research structures that identify the impact of specific strategies on English learner pupil achievement. Teacher mentors demonstrate elements of effective instruction through use of live-stream and digital lesson capture technologies. Proposed goals, measureable objectives, and outcomes for MAST²ER logically connect to needs of K-12 students at-risk of educational failure, gaps and weaknesses in target school districts, and the national need to prepare teachers, particularly STEM teachers, to serve diverse students.

In summary:

- Goal 1 – Relates to the: Infusion of Effective Teaching Practices with LEPs in Math and Science Teacher Preparation Programs, thereby Promoting Science, Technology, Engineering, and Math (STEM) Education.
- Goal 2 – Relates to the: Collection, Analysis, and Use of High-quality Data on Program Participant Outcomes, thereby Enabling more Data-based Decision-making.
- Goal 3 – Relates to the: Improvement of Student Achievement, Especially at the Secondary School level, thereby Improving Achievement and High School Graduation Rates.

The service delivery model employed in *MAST²ER* will utilize cohort groups of teacher mathematics and science teacher candidates who will engage in intensive professional development workshops on SIOP (Sheltered Instruction Observation Protocol) and evidence-based practices for English learners (ELs); for example, Classwide Peer Tutoring, Numbered Heads Together, Classwide Tutoring Teams, and Response Cards. Teacher candidates will be supported to apply action research in their field experiences, producing a Teacher Work Sample that documents use of pre-assessment, instruction, post-assessment, and reflection on pupil performance to direct instructional decisions. Cohort groups of district teachers, particularly mathematics and science teachers, will undergo advanced SIOP training using a “training of trainer” model. This training will offer more in-depth study of SIOP elements for teachers with previous SIOP training. These teachers will also participate in intensive training on mentoring; after the training, the teacher will serve as mentors to teacher candidates at SUNY Fredonia in their field experiences. Mentor teachers will facilitate implementation of SIOP elements and evidence-based practices by teacher candidates, and will demonstrate data-based decisions in planning, implementing, and reflecting on instruction to ELs.

MAST²ER activities will work at removing the barriers to instructional success for newly qualified mathematics and science teachers. Unique to this project is the use of live stream and digitally captured lessons of mentor teachers as they implement SIOP elements and evidence-

(a.) Quality of Project Design.

1. Goals, objectives, and outcomes are clearly specified and measurable.

Project MAST²ER (Mathematics And Science Teacher Training in Educational Resources) is a theory-to-practice research-based framework to strengthen mathematics (math) and science teacher education programs through infusing evidence-based practices and data-based decision making in the production of Teacher Work Samples (TWS) that inform instruction. Teacher candidates employ action research structures that identify the impact of specific strategies on English learner pupil achievement. Teacher mentors demonstrate elements of effective instruction through use of live-stream and digital lesson capture technologies.

Proposed goals, objectives, and outcomes for MAST²ER logically connect to needs of K-12 students at-risk of educational failure, gaps and weaknesses in target school districts, and the national need to prepare teachers, particularly STEM teachers, to serve diverse students.

1.a. 1 Identified Needs of K-12 Students At-Risk of Educational Failure. US schools must continue to comply with *No Child Left Behind Act* (NCLB, 2001) requirements, and now must comply with Common Core Standards (Common Core Learning Standards in New York State [NYS]) requirements, which specify literacy skills to be imbedded in content areas and specific math skills that American students need for future endeavors. Pupils must be taught by “highly qualified” teachers; *Elementary and Secondary Education Act* reauthorization adds that teachers must receive ““job-embedded” professional development” targeted to school and student needs” (*A Blueprint for Reform*, 2010, p. 15). In the face of these goals, shortages of highly qualified teachers in areas of the US threaten student achievement levels (Lemke & Harrison, 2000). NYS has teacher shortages in several areas, such as English (Grades 5-12), Sciences (Grades 5-12), and Math (Grades 5-12), (*Teacher Shortage Areas Nationwide Listing*, 2011).

1.a. 2 Identified Gaps and Weaknesses in Target School District Infrastructure. Project MAST²ER represents a collaborative effort of an institution of higher education (IHE), the State University of New York (SUNY) at Fredonia, and two NYSED-identified “high student need” small urban school districts (Dunkirk and Jamestown) in Western NY (WNY) to directly address

“professional development activities intended to improve instruction” of English learners (ELs). **IHE PARTNER. SUNY Fredonia** (Fredonia), one of 64 SUNY campuses, is located in the southwestern-most county in NYS (Chautauqua County), 45 miles southwest of Buffalo. Diverse populations in the region include a mushrooming Hispanic population. Fredonia is a Comprehensive I university, predominantly undergraduate with Master’s programs in selected areas. Total headcount for Fall 2010 was 5,769 (5,388 undergraduates). Consistently ranked highly for quality and value, recent rankings from *U.S. News and World Report* assess Fredonia as the top public northern university on its “Great Schools at Great Prices” list, 3rd least expensive public university in terms of academic excellence in the US, and 13th in the north for public Master’s level universities.

SUNY Fredonia Candidates: Although Fredonia’s educational programs have been nationally accredited by the National Council for Accreditation of Teacher Education (NCATE), content on teaching ELs by using effective instructional practices in regular education settings and use of technology linked to actual middle and high school classrooms is underrepresented in coursework for math and science (M & S) candidates. Graduates of Fredonia’s undergraduate middle school extension programs consistently identified in follow-up surveys that they need more material on how to deal effectively with students from culturally and linguistically different backgrounds (including ELs) in regular education settings (Simmons, 2005).

PARTNER SCHOOLS¹. Rural challenges to recruit and retain high-quality teachers are compounded by the number of students with limited English skills, and “... needs of highly mobile children of low-income migrant farm workers” (Monk, 2007, p. 155). MAST²ER partner schools are also in Chautauqua County, a WNY rural area with significant numbers of ELs and migrant families, which are concentrated in Dunkirk (pop. 12,570) and Jamestown (pop. 31,146).

Dunkirk City School District (CSD) is located in the north of Chautauqua County, which forms part of the northern border of Appalachia, and serves 1,999 students in 4 elementary

¹ Data for partner districts were taken from the 2009-2010 New York State School Report Cards.

schools, 1 middle school and 1 high school. Almost 13% of its students are ELs (NYS average is 1.4%), (Balter & Duncombe, 2005, *Teacher Recruitment Practices in NY School Districts*).

Jamestown CSD is located in southern Chautauqua County, at the Pennsylvania border, and serves 4,963 students in 6 elementary schools, 3 middle schools, and 1 high school. Nearly 19% of its students are from culturally/linguistically diverse backgrounds; over 3% are ELs.

Both school districts are small city districts in an impoverished rural county characterized by: low rankings in *Business First's 2010* rankings of 97 WNY public school districts (rank: Dunkirk-95th, Jamestown-84th); high number/percent of ELs by size and relative to NYS; over 55% free/reduced lunch; few TESOL/ESL teachers who, particularly at the middle and high school levels, have very limited contact with ELs; low academic performance for ELs; and limited professional development resources. NYS Report Cards for the districts documents ELs' low performance on NYS elementary and middle grade tests (ELs did not make adequate yearly progress [AYP] in English Language Arts), and on NYS Regents exams (grades 9 through 12).

Dunkirk and Jamestown CSDs currently employ staff teaching outside of their certification areas (1%, 2% respectively) and report that 1% of their teachers were not highly qualified in the 2009-10 school year. Although certification in appropriate areas is a priority, recent discussions with the districts indicated that, 1) both experienced growth in EL enrollment over the last 3 years, and there is: 2) concern over EL academic performance and drop-out rate, and 3) a shortage of secondary content teachers with training in effective instructional practices for ELs. Partner districts offer professional development opportunities for teachers; these efforts are neither *intensive* nor *solely focused* on addressing needs of ELs. Recent closure of the Chautauqua County Teachers' Center (CCTC) significantly decreased professional development opportunities, as CCTC offered over 75 professional development workshops annually. School personnel stressed their need for intensive, ongoing training in evidence-based practices for ELs in content area courses, particularly math and science, and formal mentor training.

1.a. 3 National Need for Professional Development of Personnel. While our nation has been challenged to ensure teachers are highly qualified, the composition of our student population has

changed. Increasing ethnic diversity, particularly regarding Hispanic students, means that significant numbers of these diverse students speak a language other than English (*National Center for Educational Statistics*, 2010). In 2008, 21% of students spoke a language other than English at home; in 75% of these cases, the language was Spanish (NCES, 2010).

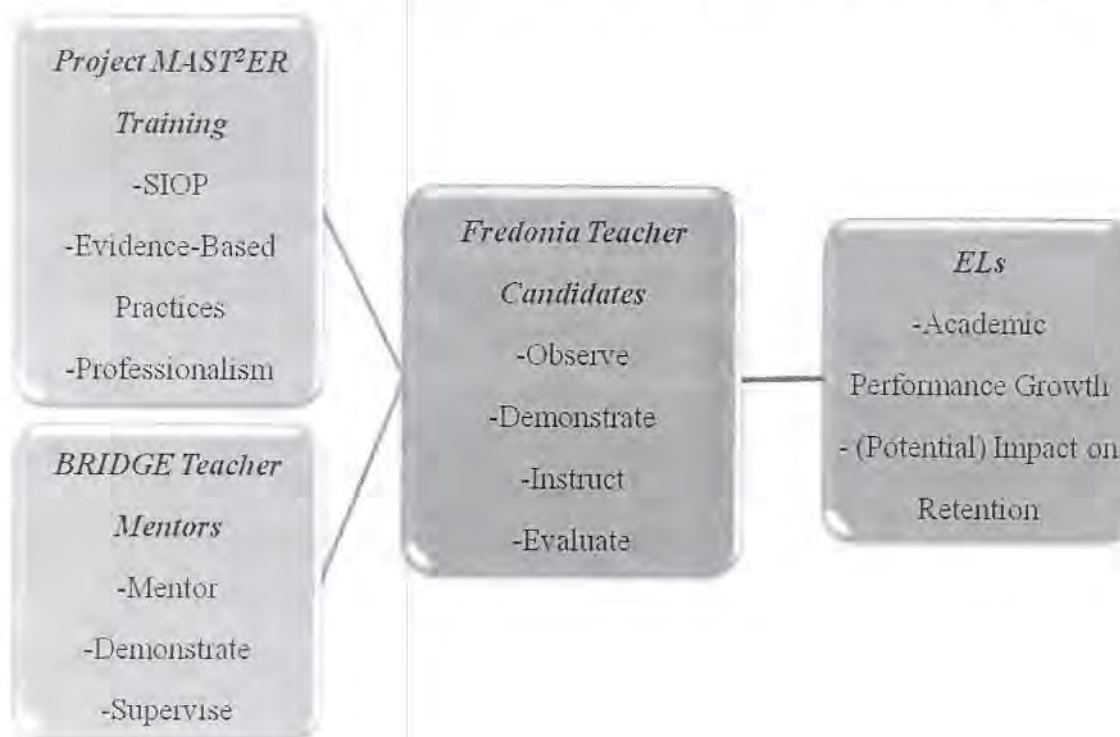
Changing demographics present several significant issues in teaching and learning. In American cities, students from diverse cultural backgrounds, who typically live in poverty, may be the majority of the student population, yet often are taught by White teachers living outside the community. As a result, many teachers do not understand their students' cultures, often assuming that cultural strengths are instead academic deficits (Pugach & Johnson, 2002, p. 9). Even highly qualified content teachers, not conversant in evidence-based practices for ELs, but with ELs in their classrooms, may expect that ELs will learn the same content to the same levels as native English speakers. Limited capacity of teachers has been identified as one factor in our schools' failure to address the needs of adolescent ELs (Short & Fitzsimmons, 2007): Waxman (2004) reported that almost half of all teachers were not prepared to teach ELs, and *Improving Teacher Quality for LEPs Laboratory for Student Success* (2004) concluded that nearly half of all teachers working with ELs have not received any preparation in methods to teach them. This is consistent with two reports from the National Clearinghouse for Bilingual Education (NCBE): *The Preparation and Certification of Teachers of LEP students* (NCBE, 2001) and *Improving Teacher Quality for LEPs Laboratory for Student Success* (NCBE, 2004), and with Gandara (2005) who states that teachers (particularly in California) are "ill-prepared" to meet the needs of ELs. "Leaving teachers on their own to determine how to teach is not an effective way to support teachers and is unfair to teachers" (Sterling & Frazier, 2011, p. 41).

1.b Project Design, Goals, Objectives, and Outcomes. No professional development plan can operate without clear goals, objectives and outcomes, guided by a clear project design.

1.b. 1 Project Design. The overall goal or aim is to affect change in the professional development of M & S teacher candidates at two levels: M & S Teacher Preparation Programs, and Mentor Teachers (see Figure 1). Project MAST²ER addresses the need to prepare middle and

high school math and science (M & S) teachers to deal with ELs in their classrooms, and considers core content classes (i.e., math and science) as important contexts for academic language development to combat low academic performance of ELs in grades 6 to 12.

Figure 1: Relation of Project MAST²ER Components to Overall Project Design



All participants at will learn the Assessment Learning Cycle: Assess, Plan, Implement, Assess, Report/Revis (i.e., define intended learning objectives, measure selected learning outcomes, compare outcomes with intended objectives, and redesign program to improve learning). Our proposed best practices in teaching ELs, joined with coaching by mentor teachers, is likely to lead to optimal learning outcomes, thereby improving classroom instruction for ELs to meet high standards. The design of MAST²ER reflects best knowledge from research and effective practice (see further below); it is part of a comprehensive effort to improve teaching and learning while supporting rigorous academic standards for *all* students and to improve M & S teacher preparation. Our approach to “authentic” teaching-and-learning academic and language content is to: Keep it *simple*, Keep it *focused on student outcomes*, Provide *maximum flexibility*,

and Assure *maximum accountability*. To achieve these goals, we will engage in Culturally Responsive Teaching-and-Learning that validates cultural knowledge of pupils and provides comprehensive, transformative, and emancipatory teaching and learning (Bartolomé, 1994).

In **Level 1**, coursework content for M & S teacher candidates (TCs) will be expanded to include evidence-based instructional strategies for ELs and data-based decision making. Infusion of these concepts into M & S teacher training should positively impact these candidates in the field, and positively impact pupil performance in partner schools. **Level 2** builds on the success of a current NPD project (discussed further below), and provides training to partner school middle and secondary M & S teachers serving as Fredonia teacher candidate mentors. Mentors will demonstrate implementation of evidence-based practices with ELs to teacher candidates, which will be live-streamed, digitally captured, and included in a *Repository of Effective Practices*. Mentor teachers will also supervise candidates in field experiences, highlighting use of data-based decision making when planning and implementing instruction with ELs.

Teacher Candidate (TC) Training (Level 1) – Project MAST²ER will revise and realign teacher candidate models for ELs with evidence-based practices tied to NYS English Proficiency Standards, Content Standards, and Common Core Standards, aims consistent with National Clearinghouse for Bilingual Education mandates and *A Blueprint for Reform (2010)*. Project MAST²ER proposes changes in instructional practice for TCs recruited from programs leading to certification in M & S (Math, Biology, Chemistry, Earth Science, and Physics) that will directly impact ELs by using content-based ESL curricula with instructional strategies for ELs in mainstream classes. Subject area knowledge generation, application, and reinforcement will be addressed through key topics found in grade-level curricula, national standards, NYS English proficiency standards, and NYS content area standards. ELs must master vocabulary and grammar, and how content classes use English (i.e., semantic and syntactic knowledge with functional language use), and so selection of appropriate content materials and use of assessment to guide instruction will be targeted topics in professional development sessions.

Project MAST²ER proposes to provide math and science TCs comprehensive and

sustained high-quality professional development activities that will improve classroom instruction for ELs; link classroom instruction for ELs to student academic achievement *and* language development; and provide high quality professional instructional standards aligned with NYS content standards and assessments. To accomplish these objectives, MAST²ER bases its design on up-to-date knowledge from research and effective practice. Language minority education research (Bransford, Brown, & Cocking, 2000; Putnam & Borko, 2000) indicates that teacher education must be a situated practice, with training linked to actual classroom practice of teachers in local contexts (Varghese, 2006). Rapid changes in student body composition within districts increase tensions (Valdes, 1998), and place unanticipated demands on school staff, instructional practice, and curricula. Professional development negotiated among partner schools, educational staff, and higher education institutions can address these issues (Varghese, 2006).

More specifically, the theoretical framework for MAST²ER comes from implementation of state-of-the-art practical guidelines in major subject areas of the curriculum. Best practices in TESOL (Teaching English as a Second or Other Language) embrace various methods (approaches), two of which will be taught to project participants: CALLA (Cognitive Academic Language Learning Approach) (Chamot & O'Malley, 1986), and SIOP (Sheltered Instruction Observation Protocol, Echevarria, et al., 2004). Both approaches provide a coherent theoretical framework in which learning, rather than teaching, is the central focus. The approaches are based on research of cognition and cognitive instruction (e.g., Anderson, 1983), and address the academic and language needs of language minority students. CALLA and SIOP transform theory into practice by integrating academic language development with content instruction and learning strategies (Chamot, Dale, O'Malley, & Spanos, 1993), which is consistent with the national curricular standards reforms espoused by the various professional content associations.

CALLA is an instructional model that was developed to meet academic needs of ELs in US schools. It grew out of research conducted in ESL and other second language programs, while building upon work on learning strategies and cognition conducted with English-speaking students and studies of learning strategies in second language acquisition, aimed to identify

characteristics of effective learners, including second language learners (Collier, 1989). Chamot and O'Malley were interested in describing, classifying, and analyzing strategies used by effective and less effective learners in ESL and foreign language contexts. Similarly, the SIOP Model offers a research-based approach to sheltered lesson planning and implementation proven effective with ELs throughout the US. It was developed in a national research project sponsored by the Center for Research on Education, Diversity and Excellence (CREDE), which identified instructional features present in high-quality sheltered lessons.

CALLA and SIOP are widely used in the US and in other countries. Both models integrate language development, content area instruction, and explicit instruction in learning strategies and advocate and support 6 instructional concepts: 1) *Language Across the Curriculum* (i.e., infusing language teaching and learning into all areas of the curriculum); 2) the *Language Experience Approach* (i.e., connecting students' prior experiences to new concepts); 3) *Whole Language* (i.e., language needs to be experienced as a whole system of communication not separate component skills); 4) *Process Writing* (i.e., writing involves thinking, reflection, and multiple revisions); 5) *Cooperative Learning* (i.e., students work in heterogeneous groups on learning academic skills and tasks common to mainstream classes featuring practice, preparation, and evaluation); and 6) *Cognitive/Sheltered Instruction* (i.e., teaching thinking and infusing thinking in all areas of the curriculum as students participate in content courses with grade-level objectives delivered through modified instruction; Gardner, 1993; McGrath, 1992). Furthermore, CALLA and SIOP have been greatly influenced by research work of Cummins with immigrant students who found that most students needed about 2 years to develop basic interpersonal communicative skills (BICS), but needed about 5 to 7 years to develop and acquire cognitive academic language proficiency (CALP) (Cummins, 1980, 1981, 1984). That is, social interactive language skills develop more quickly than academic skills needed for successful participation in content classes (e.g., math and science). MAST²ER integrates the best of CALLA and SIOP ideas into design of professional development activities and grade-level content materials.

Intensive three-day training on CALLA, SIOP and other evidence-based practices and a

follow-up session will be scheduled for candidates each semester during the academic year. Few Fredonia M & S faculty have been trained in SIOP and the target evidence-based practices, so coverage of using data to inform instruction will be extended in M & S education courses. MAST²ER will invite M & S Program Coordinators, M & S faculty, and field supervisors to all training sessions offered to teacher candidates and to participating mentor teachers.

TCs will employ evidence-based practices in field experiences and provide a report (Teacher Work Sample [TWS]) that identifies target instructional behavior and assesses implementation of a specific instructional strategy. TCs will be expected to adjust instruction, based on pupil performance (data-based decision making). Content area mentor teachers will employ instructional strategies with proven effectiveness with ELs, demonstrating these via live streaming and digitally captured lessons. Candidate and teacher mentor use of target strategies will be monitored regularly, with student performance on content area tasks, NYS content area tests, and Regents exams as evidence of effectiveness of instructional decisions. Performance of ELs will be compared to native English speakers on content area tasks using a *response discrepancy observation method* (Rhode, Jenson, & Reavis, 1992). Each level of implementation of MAST²ER supports rigorous academic standards for TCs, classroom teachers, and EL pupils.

MAST²ER will employ ongoing intensive professional development for teaching ELs, with evidence-based instruction taught via modeling, coaching, and problem solving; data generated by instruction will be reviewed by TCs and teacher mentors. A listserv of teacher candidates and mentor teachers will allow MAST²ER to provide ongoing development in SIOP, effective instructional practices, and data-based decision making, and to field TC and mentor teacher questions via Fredonia's course management system (ANGEL) and distance learning

Mentor Teacher Training (Level 2) – MAST²ER represents an extension of services provided in Project BRIDGE (Bringing Resources that Incorporate Development in General Education). BRIDGE is a funded NPD project in its 4th year of operation. BRIDGE offers content teachers professional development in SIOP, and in specific evidence-based instructional strategies (e.g., Classwide Peer Tutoring [CWPT], Numbered Heads Together, Response Cards,

Classwide Student Tutoring Teams [CSTT]). Also, BRIDGE utilizes teacher observations to note teachers' use of SIOP and specific evidence-based instructional strategies: follow-up sessions with an Implementation Coach address challenges these teachers face in implementing SIOP and the target strategies. Through BRIDGE, the Dunkirk and Jamestown CSDs, in collaboration with SUNY Fredonia, developed 55 content area teachers highly qualified to work with ELs.

BRIDGE-trained teachers with M & S content specialties will be the first to be recruited to serve as mentors to Project MAST²ER M & S teacher candidates. Additional M & S mentor teachers will be recruited in subsequent years; all mentors will receive intensive training on CALLA and SIOP (training of trainers – 4 days), in distance learning technology (1 day each semester), and effective mentoring (4 days summer; 1 day follow-up each semester).

Mentor teachers will be expected to demonstrate SIOP elements and target strategies for streaming to Fredonia TCs. Mentor teacher lessons will be digitalized and edited for permanent capture on a *Repository of Effective Practices* to be distributed to district personnel, TCs, and Fredonia personnel electronically. Mentor teachers will be expected to host Fredonia TCs in required field-based experiences, supervising the production of an action research project that utilizes a *Teacher Work Sample* [TWS] model (described earlier). Mentor teachers will serve as SIOP turnkey trainers in their districts, expanding the impact and sustainability of this approach.

The effects of MAST²ER will continue after funding lapses. First, infusion of evidence-based practices and their impact on student learning into course content of Fredonia M & S teacher programs guarantees continuation after MAST²ER's funding cycle terminates. Second, partner districts will identify middle and high school content teachers to participate in advanced SIOP training and mentoring practices (training of trainers). By the end of funding, most content area teachers will have been trained. As above, these individuals could serve as turnkey trainers in their districts when federal funding elapses. Partner districts have employed the turnkey trainer model for other initiatives with relative success (e.g., *Step Up to Writing*). District personnel, Fredonia faculty, and TCs will have access to the *Repository of Effective Practices*, an electronic compilation of demonstrations of specific evidence-based practices and data-based decision

making. In the face of diminishing support from NYS for professional development, partner districts have written letters of support that clearly identify district contributions to MAST²ER. Because of the level of support indicated, partner districts should have little difficulty carrying on project activities without federal support, once their staff has been trained.

1.b.2 Goals, Objectives, and Measurable Outcomes. Project MAST²ER addresses OELA NPD priorities through three interrelated goals, each with observable and measurable objectives and resultant outcomes, and specific activities (see Table 1). For each objective/outcome, evaluation and compliance indicators, and performance measures are identified. Task management components are clearly identified, as are related GPRA measures, which are interwoven as integral parts of the project design to strengthen project integrity and ensure that execution of objectives and evaluation is systematic and ongoing. The Evaluation Team (ET), composed of Project Director, Principal Investigators, Program Coordinator, outside Program Evaluator, and others as necessary, will meet quarterly, or more often as needed, to review evaluation data, determine implications, and monitor project implementation and effectiveness. Timelines/milestones for implementing related activities are included for each objective.

GOAL 1 - INFUSION OF EFFECTIVE TEACHING PRACTICES WITH LEPs IN MATH AND SCIENCE TEACHER PREPARATION PROGRAMS: PROMOTING SCIENCE, TECHNOLOGY, ENGINEERING, AND MATH (STEM) EDUCATION: (Competitive Priority #3, Invitational Priority #2). To increase opportunities for high-quality preparation of, or professional development for, teachers or other educators of STEM subjects.

OBJECTIVE 1.1: Each year, forty-five of 50 (90%) math and science (M &S) teacher candidates will incorporate evidence-based practices for ELs in their field experiences.

1.1 Activities: Professional development sessions on evidence-based instructional practices for ELs and SIOP; Review and discussion of Teacher Work Samples; Monitoring of implementation and success through self-report and other document review; and Discussion of EL needs in math and science and alignment with local and state standards.

Evaluation/Compliance Indicators/Performance Measures for Objective 1.1:

- 1.1.1 – 90% of preservice program completers (M & S teacher candidates) will be NYS and/or locally certified, licensed in Math or Science, or endorsed in EL instruction. (GPRA 1.1)
- 1.1.2 – 80% of preservice program graduates will be placed in instructional settings serving limited English proficient students within one year of graduation. (GPRA 1.2)
- 1.1.3 – 70% of pre-service program graduates will be providing instructional services to EL students three years after program completion. (GPRA 1.3)
- 1.1.4 – Overall, teacher candidate knowledge of evidence-based instructional practices will improve through project participation, as evidenced by pre- and post-surveys.
- 1.1.5 – 80% of included Teacher Work Samples (TWS) will document implementation of evidence-based instructional practices with ELs.

1.1 Timeline/Milestones: Each year, a new cohort group of 50 M & S teacher candidates will be recruited for participation. Simultaneously, the previous year's cohort will be monitored for continued use of evidence-based instructional practices with ELs (beginning in Year 2).

OBJECTIVE 1.2: 80% of M & S field-based courses will incorporate information about ELs and evidence-based practices for ELs.

1.2 Activities: Professional development sessions for faculty (simultaneous with teacher candidates) in Fredonia's M & S education programs; Project-sponsored discussions for M & S faculty about potential curriculum revision; and Monitoring of implementation and success through self-report and other document review.

Evaluation/Compliance Indicators/Performance Measures for Objective 1.2:

- 1.2.1 – Overall, M & S faculty knowledge of evidence-based instructional practices will increase through project participation, as evidenced by pre- and post-surveys.
- 1.2.2 – 80% of M & S faculty syllabi and course assessments (papers, tests, TWS, etc.) will document implementation of evidence-based instructional practices with ELs.

1.2 Timeline/Milestones: A new cohort of Fredonia M & S faculty will be invited to participate each year. Simultaneously, the previous year's cohort will be monitored for continued use of evidence-based instruction with ELs in their courses(beginning in Year 2).

GOAL 2 – COLLECTION, ANALYSIS, AND USE OF HIGH-QUALITY DATA ON PROGRAM

PARTICIPANT OUTCOMES: ENABLING MORE DATA-BASED DECISION-MAKING:

(Competitive Priority #2; Invitational Priority #1) To increase preservice and inservice teachers' capabilities to utilize more data-based decisions accurately in instruction and assessment of ELs.

OBJECTIVE 2.1: 80% percent of M & S teacher candidates will use data to make instructional decisions for ELs in their field experiences.

2.1 Activities: Professional development for M & S teacher candidates on data-based decision making; Identical professional development offered to field experience supervisors; and Monitoring of implementation and success through self-report and other document review.

Evaluation/Compliance Indicators/Performance Measures for Objective 2.1:

- 2.1.1 – Overall, teacher candidate knowledge of data-based decisions will increase through project participation, as evidenced by pre- and post-surveys.
- 2.1.2 – 90% of teacher candidates will use data-based decisions regarding ELs within their field experiences as documented in their TWS.
- 2.1.3 – A randomly chosen 20% sample of teacher candidates will be interviewed, with 80% interpreting and acting on the data on EL instruction appropriately.

2.1 Timeline/Milestones: In each year of funding, a new cohort group of M & S teacher candidates will be recruited for participation. Simultaneously, the previous year's cohort will be monitored for continued use of data-based decision making with ELs (beginning in Year 2).

OBJECTIVE 2.2: 80% of mentor teachers will employ data-based decision making in planning and implementing evidence-based practices for ELs in their classrooms.

2.2 Activities: Professional development sessions on evidence-based practices for ELs, data-based decision making (for mentor teachers, and faculty supervisors), training on being an effective mentor, and using distance learning technology; and Project-sponsored discussions with faculty in M & S programs using candidate data to identify potential curriculum revision.

Evaluation/Compliance Indicators/Performance Measures for Objective 2.2:

- 2.2.1 – Overall, teacher mentor and M & S faculty knowledge of data-based decision making

will increase through project participation, as evidenced by pre- and post-surveys.

- 2.2.2 – Overall, teacher mentor knowledge about and use of distance learning technology will increase through project participation, as evidenced by pre- and post-surveys.
- 2.2.3 – 80% of mentor teacher demonstrations live streamed or digitally captured lessons will contain data-based decisions in planning and implementing evidence-based practices for ELs.

2.2 Timeline/Milestones: In each year of funding, M & S teachers will be invited to become teacher mentors and participate in professional development sessions on data-based decision making, mentoring, and distance learning technology. Simultaneously, the previous year's cohort will be monitored for continued use of data-based decisions with ELs (beginning in Year 2).

GOAL 3 – IMPROVEMENT OF STUDENT ACHIEVEMENT, ESPECIALLY AT THE SECONDARY SCHOOL LEVEL: IMPROVING ACHIEVEMENT AND HIGH SCHOOL GRADUATION RATES: (Invitational Priority #1) To support the use of instructional strategies effective in positively impacting academic performance of ELs in partner secondary schools.

OBJECTIVE 3.1: Forty (80%) of M & S teacher candidates will incorporate evidence-based practices for ELs in their field experiences that positively impact pupil achievement.

3.1 Activities: Professional development sessions on evidence-based instruction for ELs, SIOP, and data-based decision making will be provided to candidates in Fredonia's M & S programs.

Evaluation/Compliance Indicators/Performance Measures for Objective 3.1:

- 3.1.1 – Overall, teacher candidate knowledge of evidence-based instructional practices will increase through project participation, as evidenced by pre- and post-surveys.
- 3.1.2 – 80% of included Teacher Work Samples (TWS) will document implementations of evidence-based instructional practices with ELs and pupil learning

3.1 Timeline/Milestones: In each year of funding, a new cohort of M & S teacher candidates will be recruited for participation. Simultaneously, the previous year's cohort will be monitored for continued use of evidence-based instructional practices with ELs (beginning in Year 2).

OBJECTIVE 3.2: Partner schools will report a 2% point increase in the percentage of performance of ELs who score a three or higher (passing) on NYS English Language Arts

(ELA), Math, and Science tests and required content area NYS Regents exams in English, Math, and Science for mentor teacher classrooms in which state assessments are given.

3.2 Activities: Content area teacher professional development sessions on evidence-based instructional strategies and advanced SIOP; and Teacher demonstrations of target instructional strategies in their lessons that are streamed live or captured digitally for teacher candidates.

Evaluation/Compliance Indicators Performance Measures for Objective 3.2:

- 3.2.1 – 100% of in-service teacher completers (mentor teachers) will provide instructional services to EL students. (GPRA 1.6)
- 3.2.2 - Review of mentor teacher live streamed and digitally captured lessons for use of evidence-based instructional practices in their lessons; A randomly chosen 50% sample of mentor teacher demonstrations will be reviewed with 100% using evidence-based instructional practices in their lessons.

3.2 Timeline/Milestones: In each year of funding, a cohort group of middle and high school content area teachers in partner districts will be recruited for participation. Simultaneously, the previous year's cohort will be monitored for continued use of evidence-based instructional strategies and data-based decisions with ELs (beginning in Year 2).

2. Project Design Supported with Up-to-date Knowledge from Research/Effective Practice.

This section complements the research and effective practice references included above.

The US student population has changed dramatically over the past 10 years with 21% of school-aged youngsters speaking a language other than English at home (NCES, 2010); 8.8% ELs (English learners) in the student population, and 67% of US schools with at least one EL (NCELA, 2011). NYS, one of 8 states with the greatest number of ELs, reports similar trends with 8% of the school age population limited English proficient (LEP; NYSTART, 2010).

Given changing demographics, it is disturbing that most states do not require teachers to have specialized ESL training. While in NYS all teacher candidates must have knowledge about linguistically and culturally diverse students for initial certification, NYS teachers report they are

unprepared to work with ELs on a regular basis. Instructional mismatches among program design, instructional goals, and student needs cause ELs to suffer academically. And too often, for ELs to meet graduation standards and other levels of achievement (*NCLB*), they must take content exams in school, for which many ELs are ill-prepared (Echevarria, Vogt, & Short, 2004; Ruiz-de-Velasco & Fix, 2000). Language minority education has an urgent need for programs using content area classrooms as language rich environments for learning English as a second language, supporting the simultaneous development of language skills and content knowledge.

Level 1: Use of data is common in the fields of math and science (M & S). Familiarizing TCs in these fields with the notion of using data to drive instruction is a paradigm shift for them. To build comfort and confidence with data-based decisions on instructional practices with ELs, MAST²ER will foster interchanges with M & S mentor teachers engaged in such decisions via distance learning. In doing so, TCs will reinforce what Moon, Callahan, and Tomlinson (1999) discovered—that preservice teachers were “more acquainted with the realities of the classroom” when mentored (p. 56). Fredonia candidates will understand from their interactions with mentor teachers what Moon et al. term “the complexity involved in appropriate curriculum modifications to address the academic needs of diverse learners” (p. 56).

Level 2: There is growing concern about increasing attrition of first year teachers paralleled by an increasing interest in teacher induction (mentoring programs) (Ingersoll & Strong, 2010). Teacher induction literature reports effects of mentoring on mentors and mentees (e.g., Hobson Ashby, Malderez, & Tomlinson, 2009). Although the Holmes Group (1990) proposed changes to teacher preparation programs citing the need for teacher mentors for preservice candidates within their internships, there remains a paucity of research on the impact that teacher mentors have on preservice teachers (TCs).

MAST²ER is built on the principles of effective mentoring and coaching; namely, veteran teachers serving as personal guides for new teachers (e.g., Ingersoll et al., 2010; Strong, 2009). Coaching and mentoring have been documented as having positive impact on TCs, teachers, and pupils (e.g., Ingersoll & Strong, 2010). Training of teacher mentors in Project MAST²ER builds

on principles that mentoring "...must be linked to a vision of good teaching, guided by an understanding of teacher learning, and supported by a professional culture that favors collaboration and inquiry" (Feiman-Nemser, 1996, p. 2). Partner school teachers will participate in intensive training on how to be an effective mentor to preservice teachers, a role that differs from mentoring a colleague. Sterling and Frazier (2011) claim that supporting new science teachers in the classroom results in positive effects on instruction *and* on student performance.

(b.) *Quality of Personnel.* To preface this section, Project MAST²ER recruitment and outreach efforts within the Fredonia's M & S education programs, collaborating school districts, and in the surrounding communities are themselves important steps to equitable access to employment and participation in Project MAST²ER. Second, in accordance with SUNY's fiscal agent, the Research Foundation of the State University of New York (RF), and with Fredonia's strategic plans to increase diversity within its workforce, and with other relevant established policies and procedures, Project MAST²ER key staff will comply with ALL GEPA requirements to assure that ALL individuals, regardless of gender, race, national origin, color, disability, or age, have equitable access to employment, or participation in this grant. Third, Project MAST²ER will use RF policies and affirmative action plans to ensure that no otherwise-qualified disabled individual, Special Disabled Veteran, Vietnam Era Veteran, Other Protected Veteran, or Newly Separated Veteran will, solely by reason of his or her disability, shall be excluded from RF employment or be subject to discrimination if employed by the RF.

1. Qualifications and Experience of the Principal Investigators.

The Primary Principal Investigator (PI), or project faculty lead, will be **Dr. Barbara Mallette**, a full professor recently retired from Fredonia's College of Education (COE) and who holds a doctorate in special education and a Master's Degree in reading, and is an experienced PI in federal and state externally funded projects (i.e., 100% responsibility for all years of funding). Per approval by the COE Dean, Dr. Mallette will have overall project leadership for SUNY Fredonia as the IHE partner to MAST²ER. Dr. Mallette maintains many direct contacts with areas schools, and served as the IHE Representative on the Chautauqua County Teachers' Center

(CCTC) Policy Board until its closure earlier this year. Permanently certified in NYS in elementary education, special education, and reading, Dr. Mallette has teaching experience with urban low income and disadvantaged youth and English learners in the Rochester City School District that is complemented by teaching and administrative experience with rural low income and disadvantaged populations in the NYS southern tier. Dr. Mallette has taught University literacy courses, courses that address dealing with students with disabilities in inclusive settings, courses on teaching pupils from diverse cultural and linguistic backgrounds, and Master's Thesis courses. Dr. Mallette provides teacher training on developing writing skills to area schools. As a former Director of International Education at Fredonia, Dr. Mallette brings to MAST²ER varied experiences in diverse cultures, including two Fulbright-Hayes Short-Term Group Projects Abroad and service as a reviewer for Fulbright Teaching English Assistants in Asia.

Dr. Mallette has extensive administrative experience; she is currently PI for Project BRIDGE, a US Department of Education (DOE) national professional development project, in its 4th year of funding, and has been the lead author for BRIDGE presentations on content vocabulary at state and national conferences. As Interim Director of the then School of Education (SOE) from 2002-2004, Dr. Mallette supervised all externally funded programs housed in the SOE, including two TRIO Programs (Upward Bound and the McNair Scholars Program), the Migrant Outreach Opportunity Program, the Liberty Partnerships Program, US DOE funded Project ELA, the Teacher Opportunity Corps, the Science, Technology Entry Program (STEP), the Collegiate Science Technology Entry Program (CSTEP), and the former Native American Development Program. Dr. Mallette has been the Co-Coordinator of Web Degree Evaluation Development, working with the Fredonia Registrar to build summaries for all University academic programs as an online advisement tool, including math and science program requirements. She has maintained an active research agenda, and is actively involved in research in classrooms in several districts. Dr. Mallette has 18 years of service, currently as Chair, to the Human Subjects Review Committee (Fredonia's Institutional Review Board), and holds a Society of Research Administrator's International Certificate of Compliance.

As Project MAST²ER lead PI, Dr. Mallette will work with the PD to facilitate the initial start up and the ongoing progress of the project, and will oversee project evaluation. Because science and math TCs are the target participants of Project MAST²ER, Dr. Mallette's familiarity with program and classroom requirements is a decided asset to the project.

Co-Principle Investigator (secondary PI) - **Dr. Holly Lawson** will serve as the Co-Principle with sole responsibility for consultation regarding the disciplines for Project MAST²ER. In this capacity, Dr. Lawson will work with the Primary PI and curriculum consultants as they review Mathematics and Science Education Programs in light of data collected from project trainings and activities. Dr. Lawson is an Associate Professor in the Chemistry Department; she holds a Ph.D. in Inorganic Chemistry. Dr. Lawson was the founding Director of the Science Education Partnership; she leads the Partnership in joint science education collaborations (i.e., development of the Master's of Art in Teaching (MAT)/Science Program and development of "Science for Elementary Educators" content courses tailored for childhood education majors. Dr. Lawson is the academic advisor for the MAT/Science students

2. Qualifications and Experience of Key Project Personnel.

Qualifications and Experience of Project Director (PD): PD qualifications include a Bachelor's or a Master's (preferred) degree and/or teaching certification in Education, TESOL, Reading, or Literacy; background in language; at least three years experience in managing a large-scale university or externally funded project, and in managing personnel.

Ms. Cynthia Jonsson, MS.Ed., will serve as the PD. The current Director of Project ELA and Project BRIDGE, two OELA federally funded programs with annual budgets that exceed \$599,000, Ms. Jonsson will devote 75% of her time to Project MAST²ER, and will have overall fiscal and administrative responsibility, oversight of project implementation, and be supported by a full-time 12-month Program Coordinator (PC), and a 75% time, 12-month Administrative Assistant. Ms. Jonsson is uniquely qualified to direct the suite of OELA grants hosted by SUNY Fredonia, and earned a Master's in Reading (Pre-K-6), a Bachelor's in Foreign Language and Secondary Education, and holds a SIOP certificate. She has extensive

administrative and fiscal experience, federal grants management and personnel supervisory experience, teaching experience (elementary and university level), working relationships with school administrators and teachers from the region and across the country, and has presented training and workshops at regional, state and national conferences. The PD will execute and oversee contracts with program partners, communicate with the funder, submit required reports, meet regularly with the PIs, PC, and the project evaluator to ensure program objectives are being met, convene semi-annual meetings with district liaisons and key staff for reporting and feedback purposes, and coordinate training and outreach activities. The PD will facilitate coordination with SUNY Fredonia faculty, administrators, LEA and SEA personnel, and OELA, and oversee the accomplishment of COE curricular objectives in conjunction with faculty and the COE Dean.

Qualifications of Program Coordinator (PC) include a Bachelor's or a Master's (preferred) in Education, TESOL, or related field, and: a combination of education and experience relative to diverse cultures and peoples; proven ability to accomplish program objectives, and work well in a team or independent setting; experience working in education.

Program Coordinator: Ms. Korrin Mundo, will serve as the full-time 12-month Project MAST²ER Program Coordinator (PC). A Master's Degree Candidate in SUNY Fredonia's TESOL Program (August 2011), Mundo holds a BA in Political Science and Latino Studies, an AA in Social Science, and is fully SIOP trained. With both oral and written fluency in Spanish, she has experience in learning a second language and culture through living in her husband's native Mexico (MX), student teaching in Puebla, MX., and advocacy experience with the area's migrant population. Currently a support staff member for ELA and BRIDGE, Mundo has functioned as a "defacto coordinator" for almost 3 years, and worked with pre- and inservice teachers in BRIDGE, SOL candidates in ELA, and assisted with data collection and upload. Reporting to the PIs, the PC will be responsible for: day-to-day implementation of MAST²ER goals and objectives; creation of programmatic supports; and coordination of data collection with school partners, the Evaluation Team, and the Implementation Coach.

Qualifications of Administrative Assistant (AA): The PD/PC will be supported by a

12-month, 75% AA, who should have a high school diploma or an Associate's (preferred), at least 3 years project-support experience, experience with computers (Microsoft Word and Excel) and with inputting/formatting financial data, and should work well in a team setting.

Ms. Karene Gora will serve as the Project MAST²ER AA. Currently the AA for Projects ELA and BRIDGE, she has extensive grants support experience. Ms. Gora is fluent with technology and maintains all Project ELA and BRIDGE databases; she handles correspondence and advertisement, assists with report production, data tracking, newsletter publication, recruitment and scheduling associated with ELA and BRIDGE, and is familiar with federal reporting forms, and RF requirements for procurement of materials and disbursement of funds.

Curriculum Consultants. **Dr. Keary Howard**, Associate Professor in Mathematical Sciences and Program Coordinator for graduate and undergraduate certification programs in mathematics and **Dr. Kathleen Lesniak**, Assistant Professor of Science Education and Program Coordinator for the undergraduate Science Education Programs will serve as curriculum consultants to Project MAST²ER. As Curriculum Consultants, they will review all program requirements relative to Mathematics and Science Education and offer recommendations for course as well as program revisions based on data collected from MAST²ER activities.

Qualifications and Experience of Evaluator: **Catalyst Research, LLC**, an independent evaluation firm headquartered in Buffalo, NY, will serve as the Project Evaluator (PE). **Dr. Daniel Webb**, President of Catalyst Research and lead evaluator for the proposed Project MAST²ER, holds a PhD in Sociology from the University at Buffalo. Dr. Webb has over seven years of experience writing and evaluating local, state, and national grants. He also has over three years of experience in business/organizational intelligence, and evaluation and research in education (elementary through post-secondary), youth drug and alcohol prevention, health and medicine, and housing and urban development. Before joining Catalyst Research, Dr. Webb served as Director of Evaluation for a statewide evaluation firm located in Buffalo.

Dr. Webb has served as lead evaluator for two SUNY Fredonia Title III NPD projects, Projects ELA and BRIDGE. He has been active in the design and development of Project

MAST²ER, meeting with partner schools, Dr. Mallette, Ms. Jonsson, and Ms. Mundo. As PE, Dr. Webb will consult with partner schools to obtain relevant pupil and teacher mentor data, and consult with the PD and PIs to review data, prepare annual evaluation reports, conduct site visits, and offer recommendations as to use of evaluation data for continual improvement of MAST²ER.

Qualifications and Experience of Other Key Personnel:

Implementation Coach (IC) – Ms. Jean Michelli-Pendl will serve as the 10-month 25% IC, and as her primary responsibilities will be to coach TCs in the field in use of SIOP elements, observe use of evidence-based instructional strategies by TCs, and support mentoring activities in partner schools. Ms. Michelli-Pendl is SIOP trained; she currently serves as a coach for Project BRIDGE. A former ESL teacher, she has extensive classroom experience with elementary ELs in Dunkirk City School District (DCSD). Ms. Michelli-Pendl teaches the first field experience course on-site at Jamestown's neediest elementary school as an adjunct instructor at SUNY Fredonia, and is a member of the Project BRIDGE team that presented vocabulary strategies at state and national TESOL and NABE conferences.

Technology Consultant – Mr. Douglas Pendl is retired from Chautauqua Central School District where he served as Distance Learning and Technology Coordinator; he is the Coordinator of Michelangelo, a distance learning project with Erie Chautauqua Cattaraugus Board of Cooperative Educational Services and several colleges in WNY. For Project MAST²ER, Mr. Pendl will coordinate both the live streaming of mentor teacher lessons and the digitalization of lessons to exemplify SIOP elements and use of evidence-based instructional practice with ELs that will be captured in the proposed *Repository of Effective Practices*.

Graduate Intern – One Graduate Intern (GI) will be hired to assist the Office of Field Experiences with the placement of participant TCs in classrooms with ELs. Because field experiences serve as the venue for the action research projects (Teacher Work Sample [TWS]), the GI will play an important part in achieving project goals and objectives.

SIOP Institute – The SIOP Institute (Pearson Achievement Solutions), nationally recognized for expertise in effective instructional practices with LEPs, will provide a central

component of the proposed ongoing intensive professional opportunities. The Institute will conduct in-depth SIOP and CALLA sessions for TCs, teacher mentors and faculty, during three full-day sessions tailored for pre- and inservice teachers, with multiple opportunities to practice each component of the SIOP model. Two “component enrichment” sessions facilitated by project staff will focus on areas of SIOP that present the greatest challenges to participants.

Center for Applied Linguistics (CAL) – Advanced SIOP, offered by CAL, will employ a “train the trainers” model to train mentor teachers from partner schools. Mentor teachers will receive in-depth training on the eight SIOP elements as facilitators, with the ultimate goal that these teachers can serve as turnkey trainers in their districts, thereby ensuring implementation of SIOP by in their classes and sustainability of this aspect of MAST²ER after funding terminates.

(c.) Quality of the Management Plan.

1. Adequacy of management plan to achieve objectives.

Project MAST²ER has a clear management plan with benchmarks for success, including compliance and performance measures. The plan outlines organizational structure and reporting lines, support of stakeholders, an advisory board, and describes personnel, financial, and records management concluding with our plan for incorporating evaluation results and for implementation. A timeline identifying benchmarks for each objective appears in Table 1.

a. Organizational Structure and Reporting – Project MAST²ER will be physically and organizationally located in the College of Education (COE) in Thompson Hall, under the supervision of the COE Dean Christine Givner. Typically, Dean Givner meets with project directors, coordinators, and principal investigators on a monthly basis, or as needed. The Dean reports directly to Vice President for Academic Affairs, Dr. Virginia Horvath. Dr. Horvath reports directly to the President, and is a member of the President’s Cabinet.

b. Commitment of Key Stakeholders - The districts and Fredonia are committed to the improvement of middle and high school EL achievement in M & S, and their representatives, including district curricular staff, building administrators, SUNY Fredonia faculty and grant staff, met early on to discuss program elements, program design, and the evaluation model.

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Letters of support uploaded with this proposal are from: the superintendents, President Hefner, VPAA Horvath, Associate Vice-President Kevin Kearns, and COE Dean Givner.

c. An Advisory Board will oversee development and implementation of MAST²ER and will include: PI Mallette (as chair), PD Jonsson, representation from Fredonia's M & S teacher preparation programs, and school district partner representatives.

d. Personnel/Program Management. PD Jonsson will supervise Project MAST²ER staff, and oversee project implementation. Annual employee evaluations will occur in accordance with campus policies; each staff member will complete an Annual Performance Plan (APP) for the coming year, which will be used to determine staff effectiveness. The PD will be reviewed by the lead PI (Mallette) using a procedure identical to that used with other staff members.

Weekly staff meetings and, at a minimum, biweekly meetings with the PIs during the initial year of funding will ensure that personnel are on-track to achieve program goals and objectives, and are working as a unit with other campus offices and departments. Meetings will review participant progress, project evaluation activities, and upcoming events. The PD prepares Annual Progress Reports for OELA, and reports for the COE Dean. These reports will be reviewed by the Dean and Advisory Board, and necessary action taken for project improvement.

e. Financial Management Plan. The PD will have immediate financial oversight for MAST²ER, and will utilize SUNY Fredonia, and fiscal agent, the Research Foundation of SUNY (RF), policies and procedures. RF is a centralized operation with campus liaison that provides a broad arm of support for outside sponsor activities and streamlines fiscal administration across 64 SUNY institutions, and furnishes a mechanism for employment of project personnel, purchasing of supplies and equipment, and fiscal reporting to sponsors. Fredonia applies to external funding through RF, yet accepts all responsibility for project technical and scientific aspects. Fredonia's Office of Sponsored Programs (OSP) will assist the PD with grant establishment, administration, and reporting. The OSP is headed by a Certified Research Administrator, and under the guidance of the Associate Vice President for Graduate Studies and Research, who oversees Fredonia's externally funded projects. Monthly account summaries are available to the PD online through

Table 1 Project MAST²ER Management Plan by Objective with Benchmarks for Success and Timeline

Objective ²	Benchmark	Year 1	Year 2	Year 3	Year 4	Year 5
1.1	Inclusion of evidence-based practices for ELs in field experiences (FE)	Mid- & end of semester	Mid- & end of semester	Mid- & end of semester	Mid- & end of semester	Mid- & end of semester
1.2	Curriculum revision of FE courses		End of summer	End of summer	End of summer	End of summer
2.1	Use of teacher candidate (TC) data-based decision making in FE	Mid- & end of semester	Mid- & end of semester	Mid- & end of semester	Mid- & end of semester	Mid- & end of semester
2.2	Use of mentor teachers (MT) data-based decision making with ELs	Mid- & end of semester	Mid- & end of semester	Mid- & end of semester	Mid- & end of semester	Mid- & end of semester
3.1	TC - Positive impact of use of evidence-based practices with ELs in FE	End of semester	End of semester	End of semester	End of semester	End of semester
3.2	Increase in the percentage of performance of ELs on NYS English Language Arts (ELA), Math, and Science content area tests and NYS Regents exams in English, Math, and Science in MT classrooms		End of school year	End of school year	End of school year	End of school year

² Objectives are described in the *Project Design* section of this document.

the Principal Investigator Award Interface, an RF electronic budget reporting system.

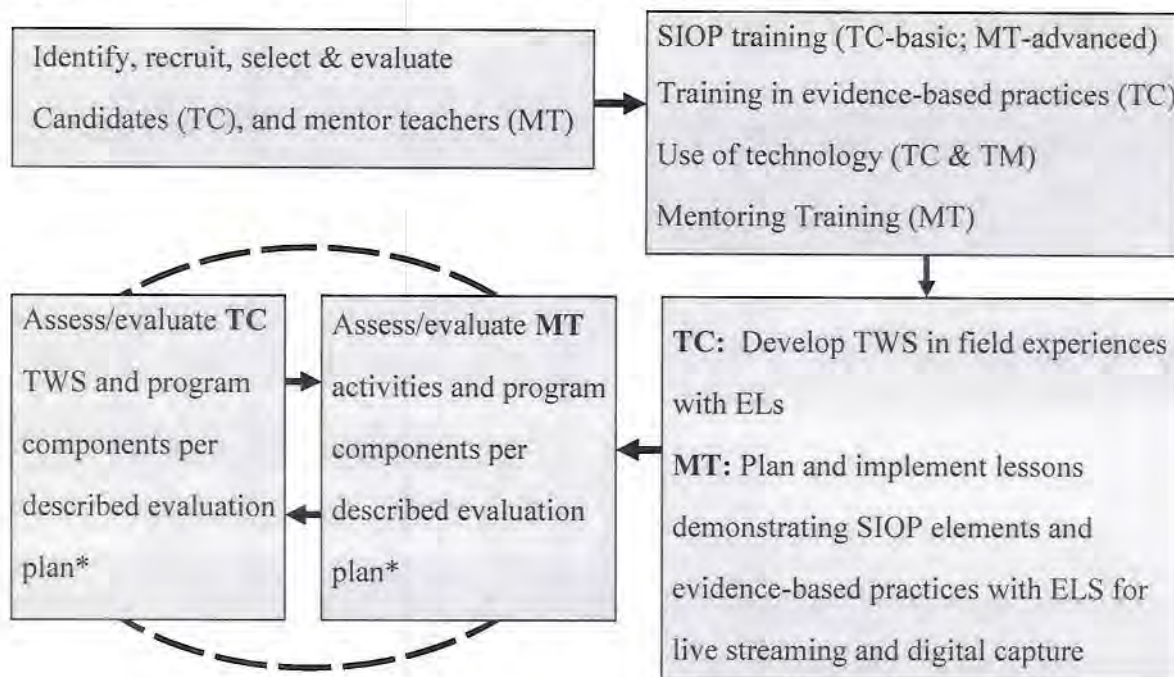
f. Participant Records Management. To protect confidentiality, all participant records will be maintained in computer files that are password protected and backed up, and in locked hard copy files. At minimum, participant files will include: intake forms and needs assessments; field experience reports; Teacher Work Samples (TWS); mentor teacher self-evaluations, candidate evaluations of mentor teachers; and pupil data.

g. Evaluation Process Management, Feedback and Continuous Improvement. While cognizant of challenges caused by travel distances between participating districts in a largely rural region impacted by winter snow, every effort has been made to offer a unified program with comprehensive and ongoing professional training for TCs in M & S certification programs and for area teachers in each district, and to utilize technology to bridge the geographic distance. The Evaluation Team (ET) will regularly review the best way to obtain data from project participants, and will regularly review evaluation data, determine implications, and monitor project implementation and effectiveness. Evaluation results for program components (e.g., training evaluations, TWS, etc.) will be available 30 days following receipt of data by the evaluator.

h. Implementation Plan. Implementation is graphically represented in Figure 2 below and will occur immediately following funding notification. This plan is action-oriented and responsive to formative evaluation. Key components include candidate (TCs) and mentor teacher needs, needs of ELs in TC field experiences, ongoing evaluation, and review of evaluation data.

Implementation of intensive professional development for TCs and teachers, and for extensive use of distance learning in partner districts requires a cadre of qualified personnel and appropriate instructional materials, with specific technology needed for live streaming of lessons. Teachers and project staff will need training in implementing, reviewing, and capturing solid examples of SIOP elements and evidence-based instructional strategies, with the ultimate goal of creating a *Repository of Effective Practices*, which will be housed and distributed electronically. Proposed costs are modest for the number of potential teacher candidates and content teachers directly involved with ELs, and the number and intensity of services for all participants. Project

Figure 2 Project MAST²ER Implementation Chart



(* The dotted circular lines denote the dynamic and continuous process of formative evaluation.)

staff responsibilities are clearly delineated in the *Project Design* section, as are proposed timelines and program milestones. Given the two levels of professionals involved in the education of ELs, significant use of technologies new to participants, and unique characteristics of partner schools, the timelines and milestones in this proposal are reasonable and achievable.

The implementation plan has 5 components, summarized in Figures 2, 3, and Table 2.

h. 1. Initial Dissemination of Project Information – Staff will produce materials (print and electronic), disseminating them through use of: a) the university’s and COE’s web page with links to MAST²ER’s web page, updated biweekly; b) project brochure to be distributed to incoming M & S teacher candidates, potential teacher mentors in partner schools districts, appropriate student groups; c) feature articles for local newspapers (*Dunkirk Observer* and the *Jamestown Post Journal*); d) campus posting of events and activities outside project office, in department and COE offices, in the events section of the campus newspaper and electronic weekly newsletter; e) Inclusion of MAST²ER in the campus directory; and dissemination at relevant state and national conferences (e.g., Association of Math Teachers of NYS).

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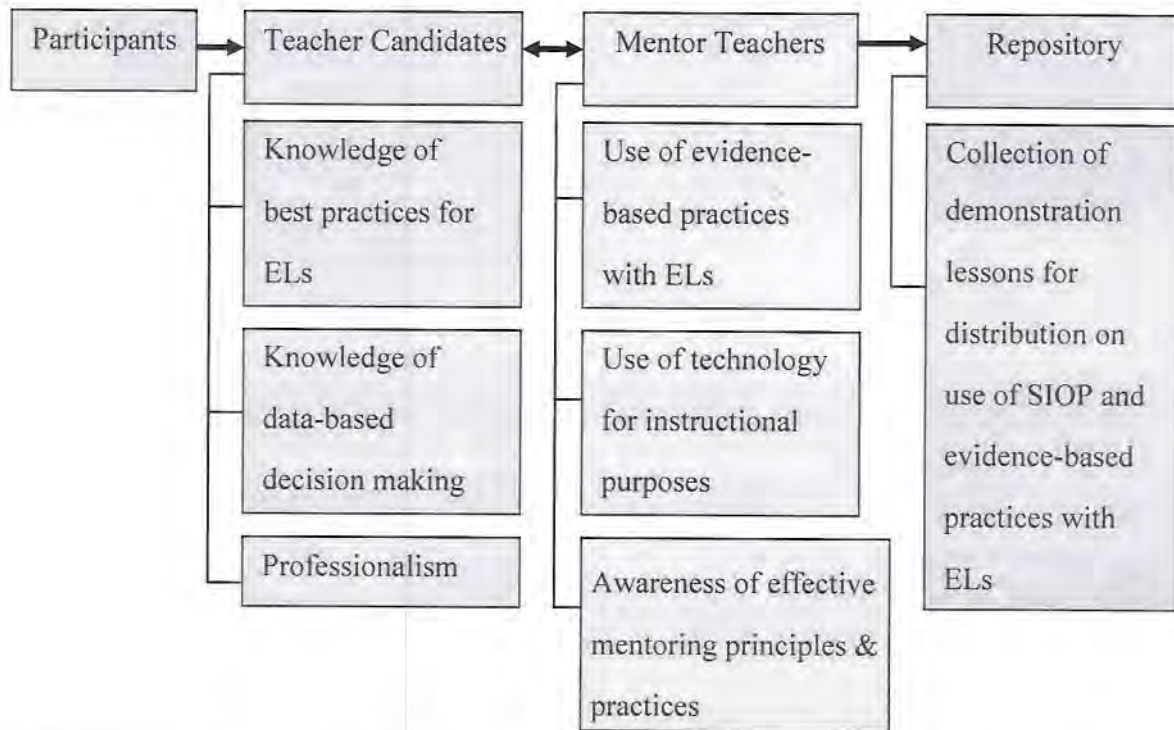
h. 2. Identification, Selection, and Retention of Project Participants – Coordinators of M & S Education Programs will recruit from the pool of students enrolled in M & S certification programs, via student orientation sessions and open houses, and use of relevant student listservs. Campus and RF policies and procedures, and PI/PD training ensure that each participant will be provided with equal treatment in the application and selection process and in the provision of services. The PI and PC will supervise selection of participants for MAST²ER from the identified candidate pool, and intake interviews with the PC and Implementation Coach include an evaluation of candidate knowledge of best practices for ELs and data-based decision making. Selection of program participants will be on a “first come, first served” basis across all levels of candidates in the M & S teacher preparation programs. Once 50 participants have been selected for Year 1, other eligible candidates will be placed on a waiting list. Ten mentor teachers will be recruited from Project BRIDGE participants from Dunkirk and Jamestown schools, with preference given to M & S teachers. Barring unforeseen circumstances, all TC are expected to continue involvement until program completion (i.e., graduation), and teacher mentors will continue involvement following their recruitment in the project until funding terminates. TC and mentor teacher satisfaction with the project will be evaluated to support retention.

h. 3 Development of Cohort Groups - “Best practice” in education supports use of “cohort groups” especially when student support services are integrated across disciplines (Deshler, Ellis, & Lenz, 1996). Cohort groups, established each year and consisting of freshmen, sophomore, junior, senior, and graduate students pursuing certification in math or the sciences, will serve as a framework of providing intensive professional development to TCs and mentors.

h. 4 Assessment of Participants – Candidates will be evaluated upon entry to determine their knowledge of best practices for ELs and data-based decision making. Teacher mentors will be evaluated to discern their use of evidence-based practices with ELs, their use of technology for instructional purposes, and awareness of effective mentoring principles and practices. Figure 3 provides an overview of the relationship of project elements to the assessment plan.

Candidate Teacher Work Samples (TWS) will be reviewed to determine knowledge of

Figure 3 Relationship of Initial and Ongoing Elements of MAST²ER Assessment Plan



implementation of SIOP elements and evidence-based practices in their lessons. Reports from mentor teachers and supervisors on field-experiences will determine TC success in instructional settings with ELs. Mentor teacher effectiveness will be reviewed via observation of mentor-candidate conferences (live or digitally captured), by review of mentor teacher lesson debriefing, and by analysis of mentor logs and candidate surveys on the mentors.

h. 5 Provision of Services – MAST²ER will offer an array of intense professional development to program participants that include but are not limited to those listed in Table 2 below. These services will be delivered using a three-prong approach described in detail below:

- *Performance-based* – Once TC baseline knowledge of best practices for ELs and data-based decision making has been identified in the application and intake process, candidates will complete a Teacher Candidate Contract outlining their responsibilities (i.e., attendance at all professional development activities, release of supervision report, TWS, etc.). Mentor teacher performance will be evaluated by the TC, the supervisor, and the teachers themselves.

Table 2 Need-Based Services Offered to Project MAST²ER Participants

Need Addressed		Program/Service Offered to Address Need
Teacher Candidates	Knowledge of SIOP & evidence-based practices with ELs	Professional development in SIOP and specific evidence-based practices (e.g., Classwide Peer Tutoring, Heads, Together, Response Cards, etc.)
	Knowledge of data-based decision making	Professional development in use of data-based decision making in implementing lessons with ELs
	Professionalism	Professional development on appropriate behavior in field-experiences and live streaming sessions
Mentor Teachers	Advanced knowledge of SIOP & evidence-based practices with ELs	Professional development in SIOP at a trainer level and review of evidence-based practices (e.g., Classwide Peer Tutoring, Heads, Together, Response Cards, etc.)
	Knowledge of effective mentoring principles and practices	Professional development in current mentoring principles and practices
	Use of technology to capture lessons with ELs	Professional development in use of technology to live stream and digitally capture lessons with ELs

- *Proactive* – The intake process will identify areas of need to tailor professional development activities to documented need for each participant group and build participant success.
- *Evaluated systematically* – Candidate and mentor teacher performance data will be reviewed by the Evaluation Team regularly and systematically, with services assessed to determine their effectiveness in assisting teacher candidates (TC) and mentor teacher (MT) student populations (including ELs), and implementation of evidence-based practices (TC & TM), mentoring strategies (TM), and action research projects (TWS-TC). An overview of assessment measures appears in the Evaluation Plan and Figure 3 above.

2. Time commitments of personnel are adequate to meet project objectives.

Based on Fredonia's experience with two currently funded OELA NPD grants, staffing is more than adequate, since implementation of objectives from those similarly-scoped grants can be met with the proposed staff. MAST²ER staffing configuration is described more fully in the previous section: PI Mallette (25%), and discipline specialist PI Lawson ; a 75% Project Director, who will oversee daily operation of MAST²ER; a 100% Program Coordinator, responsible for day-to-day implementation of project goals, objectives, and activities; a 25% Implementation Coach (Ms. Michelli-Pendl). Appropriate time-commitment from the evaluator has been secured and is reflected in the budget. Staffing also includes half-time Graduate Intern, and a 75% AA who will free the PC to focus on field-support and data collection. Program Coordinators for mathematics and science education programs will serve as curriculum consultants to the project.

Dr. Mallette's leadership brings unique qualifications and depth to MAST²ER, namely, extensive experience with externally funded projects at Fredonia, needs and personnel at area schools, and comprehensive understanding of Fredonia's academic programs from her work in the Registrar's Office on web degree evaluations. PD Jonsson has extensive experience directing two federally funded projects and working with districts and college personnel. In addition, the identified grant-funded staff is supported by the COE Dean and faculty, the COE Office of Field Experience (for candidate placement), the Science-Education Partnership at SUNY Fredonia, the Graduate Affairs Office, and the Office of Sponsored Programs (for grants management).

e) Quality of Project Evaluation.

1. Evaluation methods are thorough, feasible, and appropriate.

The evaluation methods are thorough because the Project MAST²ER Evaluation Team (ET) is highly qualified, has extensive training and experience in all proposed evaluation methods within an educational/training environment, and will implement the evaluation tools with highest regard for fidelity of use, validity, and reliability. The MAST²ER team has met with data coordinators for partner school district to ensure that data needed for proposed objectives and outcomes will be available. Through these meetings, the MAST²ER team has learned that

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both partner districts are already moving toward data-based decision making, which provides a natural overlap of priorities for partner districts and Project MAST²ER.

Evaluation methods are feasible because ET members assisted in the development of measurable objectives and reasonable outcomes. Sufficient resources are devoted to evaluation, and evaluation is a regularly scheduled part of the project timeline. The Project MAST²ER team is confident that each goal and objective is properly aligned with an evaluation method that will yield the most useful results. The team will use basic, descriptive evaluation methods to ensure that thresholds for trainings and other events are met (e.g., sign-in sheets including dates, attendees, topics covered will be used; data gathered from these sheets will be entered into a database for easy querying and monitoring). Similar tracking forms for appropriate participant outcomes (e.g., number of participants serving ELs) will be entered into the project database.

Evaluation methods are appropriate to the goals, objectives, and outcomes of the project and NPD priorities because of the lead PI's experience in developing educational designs of this nature, and SUNY Fredonia's experience with currently funded NPD projects. Evaluation was developed as part of the project design in tandem with the planning of each component; the plan includes performance measurement indicators that operationalize each objective. The Evaluation Team is a key factor in the project implementation plan, and will work to give precise and extensive evaluations of MAST²ER at distinct points within the project timeline. For example, the methods of evaluation for discrete program components (e.g., training evaluations, TWS) will be available 30 days following receipt of data by the evaluator, and will be used to improve these discrete components, and to make appropriate changes to future implementation. Formative changes made as a result of evaluation will be documented, and noted in the annual reports.

The team will use qualitative methods to assess data elements (Teacher Work Samples, course syllabi, etc). The evaluation team has expertise in qualitative methods and can accurately code and assess qualitative data. In particular, the qualitative methods will give an in-depth view of project implementation and the degree to which participants are truly buying into MAST²ER.

Quantitative methods will be used in all other cases. The ET has expertise in pen-and-

paper as well as online quantitative data collection methods. Both will be used in Project MAST²ER (e.g., pre- and post-participation surveys will allow ET to report on aspects of the project such as knowledge change among participants). Surveys for knowledge change and similar metrics are developed along with the program; each survey's specific items are developed and checked against the project description and intended outcomes.

Disaggregated and aggregated pupil-level data have been discussed with the data directors at partner districts. The ET devoted a lot of time during project development to the key issues of pupil-level data access and reporting. In particular, the team has met with the districts to get support for the timely collection of data in a custom format developed for Project MAST²ER. This data routine will allow the project team to get "clean" data from the districts and accurately report on all facets of pupil- and district-level change. The ET will contribute a database of all project activities and outcomes to the *Repository of Effective Practices*.

2. Evaluation methods include use of objective performance measures clearly related to the intended project outcomes and will produce quantitative and qualitative data.

The project planning team developed the 3 goals, 6 objectives, and 17 performance measures (in section B1) through a series of face-to-face and telephone meetings, email, and document review and editing. Each performance measure was developed specifically to assess intended project outcomes and in conjunction with the associated program element. As MAST²ER is implemented, the ET, appropriate faculty and others, will design instruments and assessments to gather quantitative and qualitative data related to knowledge gained, participant feedback on learning and change, attendance tracking, technology use, and surveys of candidates, their supervisors, and mentor teachers regarding evidence-based practice implementation.

Moreover, performance measures (PMs) 1.1.1, 1.1.2, 1.1.3, and 3.2.1 (4 of 17 PMs) address the project-appropriate GPRA measures as set forth by the RFP. These measures cover GPRA measures 1, 2, 3, and 6, respectively.

- PMs 1.1.4, 1.2.1, 2.1.1, 2.2.1, 2.2.2, and 3.1.1 (6 of 17 PMs) are assessed through pre- and post-program surveys. PM 2.1.3 (1 of 17 PMs) is assessed through data gathered by formal

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interviews of teacher candidates. The interviews will be performed by the project evaluator.

- PM 3.2.2 is assessed through observation by a trained expert employed by MAST²ER. All assessment instruments, surveys, and observation protocols will be developed by the Evaluation Team and SUNY Fredonia faculty. These instruments will gather quantitative and qualitative change, and participant feedback data on project offerings and activities.
- PMs 3.2.3 and 3.2.4 (2 of 17 PMs) involve student academic achievement data analysis from data provided through the districts for NYS assessments. Evaluators will maintain student confidentiality and anonymity, and provide information by important *NCLB* breakout groups, including EL and English proficiency status. Data will be analyzed by the external evaluator to assess the degree to which MAST²ER contributes to school-level achievement change.
- PMs 1.1.5, 1.2.2, 1.2.3, 2.1.2, 2.2.3, 3.1.2, 3.2.2 (7 of 17 PMs) will be assessed through record review for evidence of implementation of knowledge afforded by MAST²ER. This qualitative information will provide: an in-depth look at implementation; and, balance to the quantitative, self-report data gathered through pre- and post-program survey instruments.

3. Evaluation methods provide performance feedback and assessment of progress.

First, the implementation evaluation methods are broad in scope. As described above, regular collection of quantitative and qualitative data will reveal discrepancies between planned outcomes, candidate and mentor teacher instructional effectiveness, and pupil achievement experiences. Attendance tracking will be supplemented by ongoing review of training and professional development evaluations, review of TWS, pupil record review, and other data that will be regularly examined by the Evaluation Team (ET) for fidelity of implementation.

Second, the evaluation methods will target three distinct groups: M & S teacher candidates (TCs), mentor teachers (MTs), and middle and high school pupils from the two target districts. TCs and MTs will attend training sessions, provide feedback, and work on projects that will inform the ET on a regular basis. These data will allow for mid-course project changes as necessary. Finally, goals, objectives, and performance measures of the proposed project were developed with fidelity of implementation in mind. The ET will consider: 1). level of

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implementation and impact of SIOP and other evidence-based practices in classrooms with ELs; 2). level of employing data-based decisions in planning, implementing, and reflecting on lessons with ELs; 3). quantity and quality of mentoring with M & S teacher candidates; 4). effectiveness of using technology to demonstrate evidence-based practices and data-based decision making; and 5). social validity of the professional development provided to candidates and mentor teachers. The measures were built to include quantitative benchmarks to assess achievement and a comprehensive inventory of other measures to gauge project implementation and outcomes.

Since the evaluation results for discrete program components (e.g., training evaluations, TWS) will be available 30 days following receipt of the data by the evaluator, the methods of evaluation will provide timely and regular feedback. The feedback is continuous; it requires accountability of program staff and the evaluator, and is supported by key staff at Fredonia. Furthermore, there will be regular evaluation meetings to ensure continuous communication between the Project Director, Principal Investigators, Program Coordinator, and the evaluator.

The evaluation methods described above allow project staff and the evaluator to collect information on implementation, process, and outcomes. As such, the evaluation methods proposed for this project will afford staff the ability to set intermediate goals through the ongoing compilation of data. Project MAST²ER proposes continuous professional development offerings and concurrent project activities. The active schedule of the proposed project will generate extensive process information that can be used for performance feedback and permit periodic assessment of progress toward achieving intended outcomes.

As described above, all project elements will be tracked using methods that allow the ET to compile information on an ongoing basis to show progress of implementation, success of project elements, and areas of needed improvement. The ET will create a calendar, revising it as necessary at the beginning of the project and at each evaluation meeting. The timeline of evaluation methods will be reinforced throughout the program year and allow for shared accountability to jointly develop schedules for data collection, analysis, and reporting for continuous program monitoring.