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Project Abstract
English Language and Literacy Integration in Subject Areas
(ELLISA)

Name of IHE: University of California, Santa Cruz (UCSC)

Title of Program: National Professional Development Program; Office of English Language Acquisition, Language Enhancement, and Academic Achievement for Limited English Proficient Students

Consortia Partners: San Francisco State University (SFSU)
San Jose State University (SJSU)
CERIUS (Center for Educational Research in the Interest of Underserved Students), UCSC
Alum Rock Union Elementary School District (ARUSD)
Franklin-McKinley School District (FMSD)

Project Description

The proposed project *English Language and Literacy Integration in Subject Areas (ELLISA)* addresses a critical challenge in education -- the preparation of pre-service teachers to provide effective instruction to English Language Learners (ELL) with the goal of accelerating this vulnerable student populations' acquisition of academic language, literacy and content knowledge. The project has two goals: Goal One is to develop a model of EL-focused elementary teacher preparation based on effective EL teaching practices that integrate the teaching of language and literacy into science, mathematics and social studies instruction and articulate this model across program components including subject matter teaching methods courses, student teaching supervision and mentoring by school district cooperating teachers by providing professional development to university subject matter methods instructors and teacher supervisors, and cooperating teachers from the partner school districts. Goal Two is to develop pre-service teacher education and professional development materials to enable teacher education programs and school districts to implement the ELLISA model at their own sites. Over the course of the project 10 subject methods instructors (SMI), 8 teacher supervisors (TS), and 50 cooperating teachers (CTs) in the partner school districts will have completed professional development to enable them to deliver the EL-focused model and 184 pre-service teachers will have completed an EL-focused model of teacher education and be California certified in EL instruction. A program of research and evaluation will provide formative and summative evaluation data to inform an iterative process of program development and analyze program impact on methods instructor, teacher supervisor, cooperating teacher and student teacher knowledge, beliefs and practice.

The ELLISA project incorporates four instructional practices that a substantial body of empirical research has demonstrated support the learning and achievement of ELL. These practices include: These include integrating language development (LD), literacy (L); instructional conversation (IC) and contextualization (C) into subject matter instruction. These practices will be modeled in science, mathematics and social studies methods courses and student teachers will be coached and supported in the implementation of the ELLISA practices in their student teacher practicum.

National Professional Development Project Narrative

English Language and Literacy Integration in Subject areas (ELLISA):

Building capacity in pre-service teacher education

I. Project Summary

The *English Language and Literacy Integration in Subject Areas (ELLISA)* project is submitted for consideration for funding under the *National Professional Development Program: Office of English Language Acquisition, Language Enhancement, and Academic Achievement for Limited English Proficient Students.* ELLISA addresses a critical challenge in education--the preparation of pre-service teachers to provide effective instruction to English learners to support this vulnerable student populations' acquisition of academic language, literacy and content knowledge. The ELLISA consortium includes San Francisco State University (SFSU), San Jose State University (SJSU), the Center for Educational Research in the Interest of Underserved Students (CERIUS) at the University of California, Santa Cruz (UCSC), and two partner school districts – Alum Rock Union Elementary School District and Franklin-McKinley School District (ARUSD and FMSD) both of which serve large populations of ELs. The project has two main goals: Goal One is to develop a model of EL-focused elementary teacher preparation based on effective EL teaching practices that integrate the teaching of language and literacy into science, mathematics and social studies instruction and articulate this model across program components including subject matter teaching methods courses, student teaching supervision and mentoring by school district cooperating teachers by providing professional development to university subject matter methods instructors and teacher supervisors, and cooperating teachers from the partner school districts. Goal Two is to develop pre-service teacher education and professional development

materials to enable teacher education programs and school districts to implement the ELLISA model at their own sites. Over the course of the project 10 subject methods instructors, 8 teacher supervisors, and 50 cooperating teachers in the partner school districts will have completed professional development to enable them to deliver the EL-focused model and 200 pre-service teachers will have participated in an EL-focused model of teacher education and be California certified in EL instruction. A program of research and evaluation will provide formative and summative evaluation data to inform an iterative process of program development and analyze program impact on subject methods instructor, teacher supervisor, cooperating teacher and student teacher knowledge, beliefs and practice.

II. Project Significance

Several pressing issues call for institutions charged with the responsibility to educate prospective teachers to re-think their model of teacher education to better address the educational needs of ELs. Linguistic minority students are the fastest growing sector of the school-age population. The National Education Association (NEA) projects that by 2025 one in four students in the U.S. will be from homes where a language other than English is spoken. Currently, California public schools educate over one-third of the nation's English Learners (*California Legislative Analyst's Office report, 2007-08.*) However, the number of EL students is growing rapidly in other parts of the country (Meyer, Madden & McGrath, 2000). ELs are among the most academically vulnerable students in schools today (Wong-Fillmore & Snow, 2000). For at least thirty years the achievement of ELs has lagged behind that of native English speakers in mathematics, science and literacy (Buxton, 2006; Grigg, Daane, Jin & Campell, 2003; Lee & Luyxk, 2006; NCES, 2006).

Effective Teaching for ELs

Fundamental to the problem of EL student under achievement is the separation between the teaching of subject matter and the teaching of language and literacy. Many ELs do not have access to rigorous subject matter instruction and are relegated to remedial instructional programs because it is assumed that proficiency in English language and literacy is a prerequisite to learning subject matter content (Collier, 1989; Cummins, 1981; Garcia, 1993; McGroaty, 1992; Met, 1994; Valdes, 2001). A substantial body of research on the English language development, however, has demonstrated that the integration of subject matter teaching with language and literacy development can enhance learning in both domains (Cummins, 1981; Genesee, 1987; Lambert & Tucker, 1972; Met, 1994). The ELLISA project will build on the research on effective instruction for EL and prepare student teachers to use four key instructional practices (hereafter referred to as ELLISA practices) in teaching subject matter to ELL. These include integrating language development (LD), literacy (L); instructional conversation (IC) and contextualization (C) into subject matter instruction.

Language Development: The teacher modifies and scaffolds instruction to help ELL students increase both their English language fluency and content understandings. Teachers' modify their talk decreasing speed of speech, increasing wait time, rephrasing, etc. so that ELL students can better understand teacher instructions and new content. The teacher also gives instruction on English language development, such as figurative language, idioms, grammar and mechanics (i.e. cold/colder/coldest, "raining cats and dogs," etc.), and provides students with feedback on their English language usage when appropriate. S/he consistently scaffolds content instruction through the use of scaffolds and SDAIE strategies such as gestures, manipulatives,

audio, visuals, demonstrations, word walls, graphic organizers, technology, and other instructional tools (see Hogan & Pressley, 1997; Spycher, 2009; Wong-Fillmore, & Snow, 2000).

Literacy integration: The teacher both promotes content-based vocabulary learning and engages students in reading and writing activities that are authentic to the content-area, i.e. reading non-fiction readers, news articles, writing up investigation/experiment procedures and results, using notebooks, etc.). The teacher gives clear instructions on how to use these materials within class activities and provides feedback to the students on how they are using the materials (i.e. feedback on written assignments, guidance on how to use research materials on the Internet, etc.). The teacher also introduces and uses key terms and ensures students have multiple opportunities to review and use those terms during the lesson. S/he also makes sure to check for student understanding of new terms throughout the lesson (see (Cervetti, Pearson, Bravo, & Barber, 2007; Short, & Fitzsimmons, 2007)

Instructional Conversation: The teacher engages students in sustained discussions about subject-area topics and assists students' develop oral expressions of their reasoning and argumentation through the use of open-ended questions and probing students to discuss their ideas further. The teacher elaborates, revoices, and connects student ideas, and invites students to follow-up on others' talk (see Engle, & Conant, 2002; Hanauer, 2006; Nystrand, 1997; Saunders, & Goldenberg, 1999; Tharp, 2005).

Contextualization: The teacher integrates students' knowledge and resources from their homes and communities through culturally responsive and socially relevant instruction, and engages students in exploring concepts within their local community, ecological and global

environments. The teacher also references multicultural contributions to science (see Baquedano-López, Solís, & Kattan, 2005; González, Moll & Amanti, 2005; Tharp, 2005)

Evidence for the efficacy of the use of these four practices for EL can be found in the research literature in science, mathematics and social studies. A substantial body of empirical research have demonstrated that integrating science, language and literacy instruction increases EL student achievement in language development, reading, writing and science content (Baquedano-López, Solís, & Kattan, 2005; Bravo & Garcia, 2004; Cervetti, Pearson, Barber, Hiebert & Bravo, 2007; Ku, Bravo, & Garcia, 2004; Ku , Garcia, & Corkins 2005; Lee, Maerten-Rivera, Penfield, LeRoy, & Secada, 2008; Solís, 2005). In mathematics, recent research has emphasized the importance of using contextualized language, literacy and context in mathematics courses because both the language of instruction and the content are highly abstract and complex (Barnett-Clark & Ramirez, 2004; Garrison & Mora, 1999; Wong-Fillmore & Valdez, 1986). In social studies, instruction for ELs integrating language, literacy, instructional conversation and contextualization including the use of graphic organizers, cooperative learning activities, role playing of historical events, and classroom discussion of new terms has been shown to be beneficial to EL learning (Short, 1994).

Inadequate Teacher Preparation

The challenge is to prepare teachers to use these demonstrated effective EL instructional practices in their teaching. Currently, however, most teacher education programs do not adequately prepare pre-service teachers to integrate the teaching of language, literacy and subject matter for EL. Courses on subject matter teaching typically give little attention to the importance of valuing and incorporating the language and cultural experience of the students being served (Fradd & Lee, 1995; Godley, Sweetland, Wheeler, Minnici &

Carpenter, 2006; Stoddart et al, 2010; Zeichner, 2003). Issues relating to cultural and linguistic diversity, when taught, are presented in separate courses that often focus on social conditions not pedagogy (Met, 1994; Zeichner, 2003). It is not surprising, therefore, that a 2007 survey of teacher education program graduates from the California State University system (which prepares 60% of California teachers,) conducted by the CSU Office of the Chancellor found that over 70% of them do not feel prepared to teach EL . A comparable situation holds for teachers currently working in California K-12 schools, who report that they receive little training on how to work with EL (Gándara, Maxwell-Jolly, & Driscoll, 2005). Currently, however, there is a limited knowledge base on how to prepare novice teachers to teach both English language development and the related academic subject-content to EL students. The ELISSA program design will build on proven models of teacher education and professional development to restructure the elementary teacher education programs at SFSU and SJSU to develop novice teachers' expertise in teaching science, mathematics and social studies to ELs through the four ELLISA practices with the objective of enhancing the learning of academic subjects for the EL students they will serve.

III. Project Design

The ELLISA project will be implemented in the pre-service teacher education programs at San Francisco State University (SFSU) and San Jose State University (SJSU) and two partner school districts – Alum Rock Union Elementary School District (ARUSD) and Franklin-McKinley School District (FMSD) all located in urban centers in northern California with large populations of EL. The two teacher education programs both: (1) prepare novice teachers to work in regions of great cultural, linguistic and economic diversity; (2) both institutions have one year post-baccalaureate elementary teacher education programs with the same requirements and

coursework which is representative of the 18 teacher education programs in the CSU system. The demographics of the teacher education student populations at each campus are typical of the pre-service teacher education population nationally – the majority of whom are young white females (60%) with approximately 16% Latino, 13% Asian and 11% mixed. The findings, of this project, therefore may be generalizable to other CSU campuses and similar programs and student teacher populations nationally.

The partner school districts both serve large numbers of EL: ARUSD population is 57% ELL and FMSD is 53% ELL. The ELLISA project will develop a core of 50 elementary teachers in the partner school districts with expertise in integrating language and literacy into science, mathematics and social studies and to effectively mentor novice teachers in developing these practices and will provide a recruitment pool of approximately 180 EL certified teacher education program graduates.

Goal One: Developing an ELL-focused teacher education program

Goal One of the ELLISA project is to: a) develop a model of EL-focused elementary teacher preparation that integrates the teaching of academic language and literacy into science, mathematics, and social studies instruction to prepare teachers to better serve English learners; and (b) articulate this model across program components including subject matter methods courses, pre-service teacher supervision, and mentoring by cooperating teachers in pre-service teacher preparation programs at SFSU and SJSU by (c) providing professional development to methods instructors, pre-service teacher supervisors, and cooperating teachers in the partner school districts.

Objective 1.1. Develop professional development (PD) models for methods instructors, teacher supervisors, and cooperating teachers (Year 1).

Objective 1.2. Provide PD for science, math, and social studies methods instructors to develop integrated methods courses (Years 2-4).

Objective 1.3. Provide PD for pre-service teacher supervisors and cooperating teachers to enable them to effectively mentor pre-service teachers to effectively develop ELs' academic language and literacy and content learning in math, science, and social studies (Years 2-5).

Objective 1.4. Prepare pre-service teachers who will be able to provide effective instruction to ELs by integrating academic language and literacy in science, mathematics, and social studies.

Outcomes

184 pre-service teachers have completed an EL-focused model of teacher education; 100% are California certified in EL instruction.

10 methods instructors, 8 teacher supervisors, and 50 cooperating teacher have completed professional development to enable them to deliver the EL-focused model.

100% of cooperating teachers are providing instructional services to ELs.

All participants' (pre-service teachers, methods faculty, pre-service teacher supervisors, and cooperating teachers) knowledge, beliefs, and practices are supportive of ELs' learning.

Measures: Surveys, interviews, and observations of methods instructors, pre-service teacher supervisors, cooperating teachers, and pre-service teachers (For details on these measures, see the evaluation plan below.)

Professional Development Program

The design of the ELLISA professional development program is based on four research-based principles: (1) coherence needs to be established between the different components of the teacher education program – coursework, practicum and supervision (Stoddart, 1993b; Wilson,

Floden & Ferrini-Mundy, 2001; Zeichner 2003); (2) teaching of subject matter methods should be integrated with the teaching about the language and culture of the students being served (Dalton, 1998; Fradd & Lee, 1995; Met, 1994; Zeichner, 2003); (3) teachers need to learn new instructional approaches through the pedagogy they are being prepared to teach and be provided with explicit models (Ball & McDiarmid, 1990; Stoddart, Connell, Stofflet & Peck, 1993; Stofflett & Stoddart, 1994); and (4) Teachers need coaching and support on the model they are implementing (Joyce & Showers, 1995; Loucks-Horsley, Hewson, Love, & Stiles, 1998; Speck & Knipe, 2001). These principles will be built into both the professional development for subject methods instructors, teacher supervisors and cooperating teachers and into the pre-service teacher preparation program.

The professional development program will have two main activities for each group (SMI, TS and CT). All will participate in an annual three day summer institute followed by role-specific professional development throughout the academic year.

ELISSA Summer Institute

To support the development of expertise and coherence across the team the SMI, Ts and CT will participate in an annual 3 day ELLISA summer professional development institute which will focus on science Year 1, mathematics Year 2, social studies Year 3, and alignment and elaboration across subject areas in Years 4 and 5. The ELLISA Summer Institute will include:

1) Analysis of the four ELLISA effective ELL practices (LD, IL, IC, & C) including theory, research and practice with observation of video clips and analysis of instructional exemplars and curriculum units in the subject focus area.

2) Personal Learning Experience of science, mathematics or social studies through an integrated ELLISA instructional unit incorporating the California Subject Matter and ELD standards and modeling LD, IL, IC, & C.
3) Development of an ELISSA integrated instructional unit.
4) Review of formative evaluation data (years 3, 4 & 5).

In addition to participation in the summer institute each participant group – SMI, TS and CT.

Subject Matter Methods Instructors Professional Development

Over the course of the five year project the 10 participating methods instructors will work in subject teams to develop science, mathematics or social studies subject matter methods courses that integrate and model the four ELLISA instructional practices. Professors Bravo and Whitenack, the lead ELD instructors and P.Is at SFSU and SJSU will collaborate with each subject matter methods instructor to integrate ELD language and literacy development into their courses and provide coaching and support at their sites. Each instructor team, composed of one subject methods instructor from SFSU and SJSU, will participate in a development year and two years of supported implementation.

The subject matter methods courses will be collaboratively developed around a set of five student teacher learning activities: (1) personal learning of subject matter content (science, mathematics, social studies) through ELLISA; (2) study of research and practice of ELLISA through reading, discussion and observation of classroom videos; (3) analysis of California subject matter and ELD standards, curriculum and development of lesson plans; (4) teaching an ELISSA lesson; and (5) reflection, critique and revision. In each class session of the course the four ELLISA teaching practices will be used. Therefore, student teachers will engage in language and literacy activities, use contextualized exemplars, work in collaborative groups and

the methods instructor will use instructional conversation to challenge students to analyze instructional practice.

As part of the course development process SMI will videotape themselves teaching and bring selected segments to the group to discuss successes an challenges on implementing the ELLISA pedagogy in their methods classes. In the two years of implementation year, the instructors will be observed and receive coaching and support four times. They will meet quarterly to discuss implementation and revise their courses.

Teacher supervisors and cooperating teacher' professional development

In addition to attending the annual three day ELLISA summer institute, the ELLISA teacher supervisors and cooperating teachers will attend a two day workshop on student teacher observation, coaching and feedback using a rubric of the ELLISA practices. They will also review and analyze the subject methods instructional units used in the methods courses. These objectives will support the Goal One outcome of proving ELLISA student teachers with coaching and support from ELISSA-trained cooperating teacher in whose EL classroom they are placed and be supervised by an ELLISA-trained university teacher supervisor in their 15 week student teaching practicum.

Goal Two: Develop Teacher Education Curricula

Goal two is to develop teacher education curricula that (a) are aligned with California content and ELD standards and integrate academic language and literacy into mathematics, science, and social studies content; (b) will be used to prepare pre-service and in-service cooperating teachers to accelerate ELs' acquisition of academic language, literacy, and content knowledge in mathematics, science, and social studies; and (c) will be in the public domain for

use in teacher education and professional development to enable teacher education programs and school districts to implement the ELLISA model at their own sites.

Objective 2.1. Produce a Web-based multimedia representation of a case of K-6 science (Year 1), mathematics (Year 2), and social studies (Year 3) teaching that uses ELLISA teaching practices and is aligned with California content and ELD standards.

Objective 2.2. Use Web-based multimedia representations of ELLISA teaching practices in methods classes in science (Years 3-5), mathematics (Years 4-5), and social studies (Year 5).

Objective 2.3. Produce multimedia representations of cases of ELLISA science, mathematics, and social studies methods instructors' practice of preparing pre-service teachers to accelerate ELs' acquisition of language, literacy, and content knowledge (Years 3-5).

Objective 2.4. Create a Web-based repository of multimedia representations of cases of K-6 teachers' and teacher educators' practice and study how the cases are being used in teacher education and professional development outside of the ELLISA project (Years 3-5).

Outcomes

Methods instructors use Web-based multimedia representations of ELLISA teaching practice as curriculum materials in science, mathematics, and social studies methods courses

Multimedia representations of ELLISA teaching practice in science, mathematics, and social studies are disseminated in the public domain through the ELLISA project Web site.

Measures

Syllabi of science, mathematics, and social studies methods courses will be analyzed to ensure the courses include (1) use of multimedia representations of integrated K-6 teaching practice as curriculum materials, (2) adoption of a lesson planning framework that reflects ELLISA teaching

practices, and (3) attention to K-6 students' academic language development in course assessments

Hits to the multimedia representations of ELLISA teaching practice will be tracked on the ELLISA project's Web site.

Comments about the multimedia representations of ELLISA teaching practice that users enter on the ELLISA project's Web site will be analyzed to determine how the ELLISA materials are used in teacher education and professional development outside of the ELLISA project.

IV. Quality of Project Personnel

The participants in this project bring together exceptional expertise in teacher professional development, pre-service teacher education, the education of EL and the integration of language literacy and subject matter. The core professional development and evaluation teams are all experienced teachers of EL and teacher educators. Trish Stoddart, ELLISA P.I. and Project Director, is an experienced team leader and manager of large-scale funded instructional innovation and teacher education projects. She has a Ph.D. in Educational Psychology from UC Berkeley and is an expert in preparing teachers to teach academic subjects to EL with an emphasis on science and math. Dr. Stoddart is a Professor of Education at UC Santa Cruz where she has served as Director of Teacher Education. At UCSC she teaches pre-service teachers a course on teaching academic subjects to diverse which focus linguistic and cultural contextualization of English, mathematics, science and social studies instruction. Dr Stoddart has led several large federally funded projects including the NSF funded Local Systemic Initiative LASERS (Language Acquisition through Science Education for Rural Schools) which brought together seven school districts to improve the teaching of science to English Language learners in California's Central Valley and the USDOE Federal Eisenhower Project CCTD (California

Consortium for Teacher Development) which brought together 18 CSU and UC campuses in a research and development project on preparing pre-service teachers to work with diverse learners. She is the author of over 70 journal articles and monographs on teacher education and educational policy and reform.

The professional development component will be led by Professors David Whitenack (SJSU) and Marco Bravo SFSU in collaboration with Professor Stoddart. Both are expert in ELD, professional development and pre-service teacher education. Both have experience has EL classroom teachers. David Whitenack, Ph.D., is a graduate of the Language, Literacy, and Culture program of the Stanford University School of Education. He will serve as P.I. and Team leader of the SJSU component of the project. As an Associate Professor at San José State University, he teaches the Meeting the Needs of L2 Learners course and supervises pre-service teachers in the Multiple Subject Credential Program in the Department of Elementary Education. Dr. Whitenack has published and presented in the areas of English learner education and professional development, particularly in PDSs and other school-university partnerships. He has led professional development initiatives related to improving the teaching and learning of English learners in local school districts. Dr. Whitenack's current research, conducted in collaboration with Patricia Swanson, the math methods instructor named on this grant, focuses on student and teacher learning related to professional development that integrates foundational mathematics concepts and academic language development in teaching English learners. Previously, Dr. Whitenack has been a Research Fellow with the Carnegie Foundation for the Advancement of Teaching where he worked with teachers and teacher educators engaging in inquiry related to multimedia representations of signature pedagogies in K-12 and teacher education classrooms. A native speaker of English, Dr. Whitenack is fluent and literate in

Spanish, and his Japanese speaking and literacy skills are fair. His 19 years of experience instructing pre-service courses related to teaching English learners and supervising student teachers in classes with English learners; development, delivery, and investigation of professional development integrating academic language development and subject area teaching; and development and study of multimedia representations of the teaching practice of K-12 teachers and teacher educators will be integral to the ELLISA project.

Dr. Marco A. Bravo completed his doctoral studies at the UC Berkeley Graduate School of Education in Language, Literacy and Culture. He is currently an advanced Assistant Professor of ELD and Teacher Education at SFSU. He will serve as P.I. and Team leader of the SJSU component of the project. Professor Bravo has conducted professional development and developed curriculum materials for several national funded projects, including the Science Instruction For All (SIFA), Seeds of Science Roots of Reading and the Responsive Learning Communities projects. He was a Post-Doctoral Fellow at the Lawrence Hall of Science where he authored several children's science trade books as part of a research and curriculum development project aimed at testing the possibilities and limits of science and literacy integration. Dr Bravo teachers ELD and reading methods courses and has experiencing supervising pre-service teachers in their student teaching practicum. His current research is funded by a grant from the U.S. Department of Education's Institute of Education Sciences and the National Science Foundation. This quasi-experimental design project probes pre-service teacher dispositions toward teaching science to diverse learners, particularly English Learners. This work is being conducted through the Center for Research on Education Diversity and Excellence (CREDE). Dr. Bravo has presented his research at state, national and international conferences, including the National Science Teachers Association (NSTA) , American Educational Research

Association (AERA), International Reading Association (IRA), and the World Congress on Reading. His latest publication is a chapter titled *Teaching Vocabulary Through Text and Experience in Content Areas.* He is bilingual and biliterate in English-Spanish.

Assistant Professor Eduardo Mosqueda and Dr, Jorge Solis, affiliated researchers with CERIUS, will conduct the research and evaluation component in collaboration with Professor Stoddart. Eduardo Mosqueda, Ed.D., is an Assistant Professor of Education at UC Santa Cruz. He completed his doctoral studies at the Harvard Graduate School of Education and was awarded a Spencer Dissertation Fellowship. He will take responsibility for the collection and analysis of the quantitative data. His quantitative background includes linear and non-linear methods in large-scale data analysis that include longitudinal analysis and multilevel modeling. He also has a background in methods in educational measurement. His primary research uses the Education Longitudinal Study of 2002 (collected by the National Center of Education Statistics) and analyses the relationship between the English proficiency of non-native English speakers, their access to rigorous courses and their performance on standardized mathematics assessments. He has taught both middle and high school mathematics. He also served as a curriculum specialist for the Santa Ana Unified School District in California where he provided professional development for mathematics teachers of English Language Learners. At UCSC he teaches graduate-level courses in applied introductory and intermediate quantitative methods in educational research. He has authored or co-authored articles in the *Journal of Urban Mathematics Education*, and *Youth & Society*, and forthcoming chapters in *Immigrant Linguistic Minority Students' College Going Experiences* (edited by Linda Harklau and Yasuko Kanno) and in *Latinos and mathematics education: Research on learning and teaching in classrooms and*

communities (edited by Kip Tellez, Judit Moschkovich and Martha Civil). He is bilingual and biliterate in English-Spanish.

Dr. Jorge Solís completed his Ph.D. degree in the area of Language, Literacy, & Culture from the Graduate School of Education at the University of California, Berkeley. He will take the lead on conducting the DAISI classroom observations of Subject Methods Instructors and student teachers. As a post-doctoral researcher within Education Department at University of California, Santa Cruz, he has extended his work on language development through the Effective Science Teaching for English Language Learners (ESTELL) research project funded by the National Science Foundation. He has taken a lead role in the development of methodological and pedagogical tools for testing the efficacy of a new teacher education model that promotes effective science learning in linguistically diverse K-6 contexts within the ESTELL project. Jorge has published and presented in areas of second language development, discourse and learning, and teacher learning, particularly those engaged in teaching science in diverse contexts. Solis' has taught graduate-level courses for single-subject and multiple-subject credential teachers including courses on English language development and second-language acquisition theory. His 10 years of experience working with and researching linguistically diverse classrooms contexts and the learning of experienced and pre-service teachers, and his expertise in qualitative methodology will advance the goals of the ELLISA project forward. He is bilingual and biliterate in English-Spanish

V. Management Plan

Timeline of Activities and Milestones

Year 1: Development

Activities: PIs, methods instructors, and a small subset of supervisors and CTs will meet to develop professional development (PD) models (Objective 1.1). Recruit 50 cooperating teachers (CTs) who teach English learners (ELs) (Objective 1.4). (Repeat annually.) Identify and recruit an exemplary K-6 teacher of English learners in science (Objective 2.1). Collect materials to create a multimedia representation of teaching, including pre-, during, and post-instruction video of the exemplary teacher's science instruction, related lesson plans, lesson materials, and student work samples (Objective 2.1). (Repeat for mathematics in Year 2 and science in Year 3). Use collected materials to produce a Web-based multimedia representations of ELLISA science teaching (Objectives 2.1, 2.4). (Repeats for mathematics in Year 2 and social studies in Year 3.) Create a Web site for the ELLISA project, including an area for multimedia representations of practice (Objective 2.4).

Milestones: PD models for (1) subject area methods instructors (SMI) and (2) teacher supervisors (TS) and cooperating teachers (CT) are created (Objective 1.1). Place annual cohorts of 50 pre-service teachers in classrooms of CTs who teach ELs (Objective 1.4). An exemplary teacher of ELs is recruited into the ELLISA project to teach a science lesson (Objective 2.1). Content for a multimedia representation of science teaching is collected (Objective 2.1). A Web page of a multimedia representation of an ELLISA lesson in science is available in the public domain (Objectives 2.1, 2.4). (Repeats for mathematics in Year 2 and social studies in Year 3.) An ELLISA project Web site is accessible in the public domain (Objective 2.4).

Year 2: Science Development

Activities: PIs will engage science SMI in collaborative course planning that will enable them to integrate academic language and literacy (ALL) learning into their course and use ELLISA multimedia as curriculum (Objectives 1.2, 2.2). (Duplicate collaborative course planning for mathematics SMI in Year 3 and social studies SMI in Year 4.) Hold annual early September PD workshops for TS and CT to teach them the ELLISA teaching practices and how to coach pre-service teachers to use them (Objective 1.3). Recruit and admit pre-service teachers at SFSU and SJSU (Objective 1.4). (Repeat annually.) Annual cohorts of 50 pre-service teachers will enter the programs at SFSU and SJSU (Objective 1.4). Recruit 50 CTs who teach ELs (Objective 1.4). Identify and recruit an exemplary K-6 teacher of English learners in mathematics (Objective 2.1). Collect materials for a multimedia representation of mathematics teaching (Objective 2.1). Produce a Web-based multimedia representation of ELLISA mathematics teaching (Objectives 2.1, 2.4). Track hits and comments on the ELLISA Web site related to use of the multimedia representations outside of the project (Objective 2.4). (Repeats Years 3-5.)

Milestones: Science SMI create revised course syllabi, including use of (1) ELLISA multimedia as curriculum, (2) an ELLISA lesson planning framework, and (3) PACT academic language rubrics in course assessments (Objective 1.2). (Duplicate syllabus revision by mathematics SMI in Year 3 and social studies SMI in Year 4.) Cohorts of 8 TSs and 50 CTs will participate annually in ELLISA PD workshops to be held outside of instructional time (Objective 1.3). Annual cohorts of 50 pre-service teachers will enter the programs at SFSU and SJSU (Objective 1.4). Place 50 pre-service teachers in CTs' classrooms (Objective 1.4). An exemplary teacher of ELs is recruited into the ELLISA project to teach a mathematics lesson (Objective 2.1). Content for a multimedia representation of mathematics teaching is collected (Objective

2.1). A multimedia representation of an ELLISA lesson in mathematics is available on the Web (Objectives 2.1, 2.4). SMIs' syllabi reflect use of ELLISA multimedia as curriculum (Objective 2.2). Users visit the ELLISA Web site and comment of their use of the projects' multimedia materials in their own teacher education and professional development activities (Objective 2.4). (Repeats Years 3-5.)

Year 3: Science Implementation, Mathematics Development

Activities: PIs engage mathematics SMI in collaborative course planning (Objective 1.2, 2.2). Hold annual ELLISA PD workshop for TSs and CTs; Year 3 focus: science teaching (Objective 1.3). Recruit and admit 50 pre-service teachers (Objective 1.4). Recruit 50 CTs who teach ELs (Objective 1.4). Identify and recruit an exemplary K-6 teacher of English learners in social studies (Objective 2.1). Collect materials for a multimedia representation of social studies teaching (Objective 2.1). Produce a Web-based multimedia representation of ELLISA social studies teaching (Objectives 2.1, 2.4). Collect pre-, during, and post-instruction video of science SMIs' instruction and related lesson plans, lesson materials, and student work samples (Objective 2.3). (Repeats for mathematics in Year 4 and social studies in Year 5). Use collected content to produce Web-based multimedia representations of SMIs' practice in science (Objectives 2.3, 2.4). (Repeats for mathematics in Year 4 and social studies in Year 5). Track hits and comments on the ELLISA Web site (Objective 2.4).

Milestones: Mathematics SMIs create revised course syllabi (Objective 1.2). Cohorts of 8 TSs and 50 CTs will participate in ELLISA PD workshops focusing on teaching science (Objective 1.3). A cohort of 50 pre-service teachers will enter the program (Objective 1.4). Place 50 pre-service teachers in CTs' classrooms (Objective 1.4). An exemplary teacher of ELs is recruited into the ELLISA project to teach a social studies lesson (Objective 2.1). Content for a

multimedia representation of social studies teaching is collected (Objective 2.1). A multimedia representation of an ELLISA lesson in social studies is available on the Web (Objectives 2.1, 2.4). SMIs' syllabi reflect use of ELLISA multimedia as curriculum (Objective 2.2). Content for multimedia representation of science SMI is collected (Objective 2.3). (Repeats for mathematics in Year 4 and social studies in Year 5). A Web page with multimedia representations of the use of ELLISA multimedia as curriculum in science SMIs' courses is available in the public domain (Objectives 2.3, 2.4). (Repeats for mathematics in Year 4 and social studies in Year 5). Users visit the ELLISA Web site and comment (Objective 2.4).

Year 4: Science and Mathematics Implementation, Social Studies Development

Activities: PIs will engage social studies SMI in collaborative course planning (Objective 1.2, 2.2). Hold annual ELLISA PD workshop for TS and CT; Year 4 focus: mathematics teaching (Objective 1.3). Recruit and admit 50 pre-service teachers (Objective 1.4). Recruit 50 CT who teach EL (Objective 1.4). Collect mathematics SMIs' instructional video and materials (Objective 2.3). Produce a multimedia representation of SMIs' practice in mathematics (Objectives 2.3, 2.4). Track hits and comments on the ELLISA Web site (Objective 2.4).

Milestones: Social studies SMI will create revised course syllabi (Objective 1.2). Cohorts of 8 TS and 50 CT will participate in ELLISA PD workshops focusing on teaching mathematics (Objective 1.3). A cohort of 50 pre-service teachers will enter the program (Objective 1.4). Place 50 pre-service teachers in CTs' classrooms (Objective 1.4). SMIs' syllabi reflect use of ELLISA multimedia as curriculum (Objective 2.2). Content for multimedia representation of mathematics SMI is collected (Objective 2.3). Multimedia representations of mathematics SMIs' teaching are available on the Web (Objectives 2.3, 2.4). Users visit the ELLISA Web site and comment (Objective 2.4).

Year 5: Full Implementation: Science, Mathematics, and Social Studies

Activities: Hold annual ELLISA PD workshop for TS and CT; Year 5 focus: social studies teaching (Objective 1.3). Recruit and admit 50 pre-service teachers (Objective 1.4). Recruit 50 CT who teach EL (Objective 1.4). Collect social studies SMIs' instructional video and materials (Objective 2.3). Produce a multimedia representation of SMIs' practice in social studies (Objective 2.3, 2.4). Track hits and comments on the ELLISA Web site (Objective 2.4).

Milestones: Cohorts of 8 TS and 50 CT will participate in ELLISA PD workshops focusing on teaching social studies (Objective 1.3). A cohort of 50 pre-service teachers will enter the program (Objective 1.4). Content for multimedia representation of social studies SMI is collected (Objective 2.3). Multimedia representations of social studies SMIs' teaching are available on the Web (Objectives 2.3, 2.4). Users visit the ELLISA Web site and comment (Objective 2.4).

Table 1: Individual Roles and Responsibilities of Key Personnel

Person	Roles and Responsibilities
Trish Stoddart UC Santa Cruz	Trish Stoddart, Project Director, will have responsibility for ensuring the implementation of all project components as specified in the grant proposal. This includes coordination across partners (SFSU, SJSU, ARUSD, FMSD), management of budget and resources, producing annual reports to the NPD program, implementation of the professional development program and development of teacher education curriculum materials and coordination with the research and evaluation component. She will hold monthly meetings with the SJSU,

	SFSU and CERIUS team leaders. She will participate in the ELLISA Teacher Education Institute. She will devote 40% of her time annually to the project.
David Whitenack San Jose State University (SJSU)	David Whitenack will be the SJSU Site Director. His responsibilities include: co-leading the professional development activities for SMI, TS and CT at SJSU; providing coaching and support for the SMI; recruit cooperating teachers; and coordinating the payment of stipends to SJSU participants. He will receive a 30% time release each year for these activities.
Marco Bravo San Francisco State University (SFSU)	Marco Bravo will be the SFSU Site Director. His responsibilities include: co-leading the professional development activities for SMI, TS and CT at SFSU; providing coaching and support for the SMI; recruit cooperating teachers; and coordinating the payment of stipends to SFSU participants. He will received a 30% time release each year for these activities.
Eduardo Mosqueda UC Santa Cruz	Eduardo Mosqueda will have primary responsibility for quantitative data analysis of the survey and observation data and evaluation report writing. He will be 30% time on the project each year.
Jorge Solis UC Santa Cruz	Jorge Solis will have primary responsibility for conducting the qualitative DAISI observations and semi-structured interviews

	with SMI (n= 80 observations and interviews over 4 years) and student teachers (n=200 observations and interviews over 4 years). He will code the observation and interview data and produce annual research reports. He is on the project 60% time

VI. Research and Evaluation

Researchers from CERIUS at UCSC will implement a mixed methods program of research and evaluation using a survey, a classroom observation protocol and semi-structured interviews to provide formative and summative evaluation data for ongoing program development and analysis of program impact on student teacher, subject methods instructor, teacher supervisor knowledge, beliefs and practice. The evaluation team (Eduardo Mosqueda and Jorge Solis), with the assistance of a graduate student researcher, will conduct all data collection and analysis to create independence between the evaluation and program implementation components and maintain the objectivity of the research and evaluation program. The data will be stored at CERIUS.

Outcome Measures

The survey, observation rubric and interview instruments are designed to measure methods instructors, teacher supervisors, cooperating teachers and student teacher knowledge, beliefs, and practice relating to their implementation of the four ELLISA practices -- 1) Language Development (LD); 2) Literacy integration (L); 3) Instructional Conversation (IC); and (4) Contextualization (C) -- in the instruction of ELs across subject-areas – science, mathematics and social studies. The three instruments are aligned along the four ELLISA

practices and allow for correlational analysis of the interrelationship between the development of knowledge, beliefs and practice.

ELLISA Teacher Beliefs Survey (ETBS)

The Teacher Beliefs Survey to be used in this project was developed by Professors Stoddart, Bravo and Mosqueda to assess teacher's beliefs about integrating language, literacy and subject teaching for ELs. The ETBS will be used to assess program impact on SMI, TS, CT and pre-service teachers beliefs about the ELLSI practices. The survey has two sections. Section 1 contains questions on demographic information (age, gender, ethnicity) and also includes items on additional observable measures that could influence teacher beliefs and practices in teaching ELs (e.g. language proficiency, professional education, and whether student teacher is in a bilingual credential program). Section II measures instructional beliefs and knowledge related to integrating language, literacy and content instruction for ELs. The survey includes 12 items (6 positive, 6 negative) for each of the four ELLISA practices (LD, L. IC and C). Each response is given on a 1-4 Likert scale representing the participants degree of agreement with each practice (1= strongly disagree, 2= disagree, 3= agree, 4= strongly agree). To establish reliability, the survey was administered to 200 pre-service teachers at a university in California's Central Valley. A Cronbach's Alpha reliability analysis of the items was used to describe the structure of the relationships between pre-service teachers' views of the four ELLISA practices. The results showed a high degree of consistency between the items on the following scales: LD ($\alpha = .89$); L ($\alpha = .87$) (C ($\alpha = .75$); IC ($\alpha = .67$); C ($\alpha = .67$). Survey items in section 2 are aligned with the DAISI classroom observation rubric (described below), which parallels teachers' instructional use of LD, L, IC and C in the classroom.

DAISI (Dialogic Activity in Science Instruction Rubric)

The DAISI classroom observation instrument will be used as an outcome measure to assess student teachers' use of ELLISA in their student teaching practicum. The DAISI was originally deigned to assess the use of the four ELLISA practices in science instruction. In the first two years of the project the rubric will be expanded to include mathematics instruction and social studies instruction. The DAISI will also be used in the teaching methods courses to assess the fidelity of implementation of ELLISA. In evaluation of an instructional or curriculum intervention it is important to consider fidelity of implementation i.e., how well an innovation is being implemented in comparison with the original program design. In studies where there is failure to implement the program as planned, there is potential to conclude erroneously that observed findings can be attributed to the conceptual or methodological underpinnings of a particular intervention, rather than the fact that it was not delivered as intended (Dane and Schneider, 1998; Dusenbury, Brannigan, Falco & Hansen, 2003; Lynch & O'Donnell, 2005). Studying fidelity of implementation can explain *why* innovations succeed and fail. It also provides important information on the feasibility of replicating the intervention. Standardized observation schedules represent the most rigorous measurement of FOI (Fullan & Pomfret, 1977; Ruiz-Primo, 2006).

The DAISI provides quantitative and qualitative measures of the quality of teachers' classroom enactments of ELLISA Pedagogy (Stoddart, Solis, Bravo & Tolbert, 2007). The DAISI is based on the Standards Performance Continuum (SPC) developed to measure the use of the CREDE Five Standards for Effective Pedagogy (CFSEP) (Doherty et al, 2002).. The DAISI elaborates and extends the CREDE categories of Language and Literacy integration, Instructional Conversation and Contextualization within disciplinary practices. Each observation

will provide scores for each of the ELLISA practices (LD, L, IC and C) which will be scored every fifteen minutes of instruction; each observation will yield approximately 3-4 scores for each ELLISA practice. Each score will be based on a 4 point rating scale (0-3) rating the degree of implementation from (a) 0 not observed—the practice is not present; (b) 1 emerging—elements of the practice are implemented; (c) 2 developing—the practice is partially implemented; (d) 3 enacting—the practice is fully implemented. The classroom observations are audio recorded and transcribed to provide exemplars of practice matched to the DAISI ratings to inform the professional development program. Inter-coder reliability was reached on the DAISI instrument with four researchers trained on using the DAISI observation rubric; Spearman's rank order coefficient ranged from .86 to .98 on the subscales and .96 for the DAISI total score, found by summing across the five subscales. Kendall's Ws ranged from .80 to .88 for subscales, and .96 for the total score.

Semi-structured interview

The semi-structured interview will provide qualitative data on methods instructor and pre-service teacher development connecting ELLISA teacher beliefs and practices that will be used as a context for teacher coaching and feedback. Each classroom observation will be followed by a semi-structured post-observation interview that takes approximately thirty minutes to complete that addresses three main areas. First, interview addresses broader contextual questions beyond the lesson itself that may impact the focal lesson such as previous student exposure to lesson topic and classroom grouping norms and practices. Second, questions also ask the teacher to describe their methodology in the delivering lesson objectives and about their own sense of efficacy. Finally, we will ask the teacher to reflect on their ELs teaching strategies used

to support content learning. Each post-observation debrief will be audio-recorded and sample records will be transcribed as examples for teacher training sessions.

Data Collection and Analysis

Subject Methods Instructors Outcome data

Each of the subject methods instructors (SMI) will complete an ETBS on 4 occasions: (1) baseline-beginning of the project; (2) at the end of their course development year; (3) at the end of their first year of implementation; and (4) end of second year of implementation. Each of the subject matter methods instructors will be observed with the DAISI rubric teaching their ELLISA methods course and interviewed: baseline (before redesigning their course) and in the first two years of implementations. Each implementation of the course will be observed 3 times for a total of 12 SMI observations and debrief interviews over three years. ANOVA and MANOVA analyses will be used to analyze changes in SMI ELLISA knowledge, beliefs and practice. The observation data will also be analyzed longitudinally using repeated measures ANOVA to track subject methods instructors' levels of implementation across years and the differences within and between instructors on the four ELLISA practices. All instructors will be provided with their scores following each implementation, and these scores will be discussed by the observers and methods instructor implementation teams.

Cooperating Teachers and Teacher Supervisors Outcome Data

CT and TS will complete the ETBS survey and be interviewed on 4 occasions: (1) baseline-beginning of the project; (2) at the end of their first year of implementation; (3) end of second year of implementation; and (4) at the end of their third year of implementation. Repeated measures ANOVA will be used to analyze changes in individual CT and TS knowledge and beliefs in the ELLISA practices over time.

Student Teacher Outcome Data

To assess program impact on student teacher outcomes, the researchers will study four successive cohorts of student teachers (n=200) from SFSU and SJSU through their one pre-service teacher education program. Year 2: Baseline cohort in the un-restructured program; Year 3: Science Implementation; Year 4 Science and Mathematics Implementation; Year 5 Science, Mathematics and Social Studies Implementation. Each year novice teachers will complete the ETBS at the beginning and end of their one-year program, be observed in their classroom placement using the DAISI (Dialogic Activity in Science Instruction Rubric) and participate in a debriefing interview. Total scores will be compared using one-way ANOVA and the full set of 4 DAISI-based sub-scores will be compared using MANOVAs and follow-up ANOVAs when justified.

Formative and Summative Evaluation

Each year of the project the research and evaluation team will collect survey data from the subject methods instructors (SMI), teacher supervisors, cooperating teachers (CT) and student teachers (ST) and DAISI classroom observation data and interview data with the SMI and ST. At the end of each project year, the research team will provide a report that analyzes participant responses to the SMI, TS, CT and student teacher's survey responses and provide ratings and instructional exemplars of SMI and ST DAISI observations. Each instructor will be able to see how their student teachers enacted ELLISA strategies in the classroom—degree of implementation of instructional practices in their student teaching practicum. The research and evaluation team meet with the development team to discuss the findings. The formative evaluation data will be used to refine the professional development program and to support the redesign of the subject methods courses.

The summative evaluation will investigate the impact of the ELLISA intervention on student teachers' beliefs and knowledge of the four ELLISA practices (LD, L, IC and C), and whether there is a relationship with the degree to which students implement these practices in the classroom during their practicum. To analyze the relationship between the ELLISA survey (predictor) and the DAISI observation data (outcome), we will use ordinary least squares regression (OLS) and also include control variables for demographic characteristics and their professional preparation.

Additionally, we will examine the fidelity of implementation of the ELLISA intervention. This analysis will examine the relationship between ST teacher beliefs (ETBS) and practices (DAISI scores) and test whether these relationships differ based on the level of implementation of instructors (SMI DAISI scores). Using OLS regression, this analysis will pay particular attention to main effects and statistical interactions between the ELLISA intervention measures and the instructor observations (ST_ETBS X SMI_DAISI) on the student teacher DAISI scores. If we find a positive interaction effect between ST ETBS scores and the SMI DAISI scores, we can conclude that the direction and magnitude of the effect of the intervention depends on the degree of instructor implementation of the four ELLISA practices. This would suggest that the hypothesized impact of ELLISA has a higher effect on the practices of student teachers with instructors with higher observed DAISI scores.

GPRA Measures

The evaluators will also collect data on pre-service teacher completion rates, EL certification and jib assignments in EL contexts. This will be done by analysis of SFSU and SJSU teacher education program records and a follow up survey of graduates. The ELLISA

program will keep records of the in-service teacher completion, EL certification and placement in EL settings.

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Project Narrative

Other Narrative

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