TABLE OF CONTENTS:

A. DATA ANALYSIS FROM ORIGINAL WAVE I FUNDING ........... 2

B. SRI – DATA SUMMARY................................................................. 9

C. SCOPE OF WORK FOR FOLLOW-ON FUNDING ..................... 11

D. BIOGRAPHICAL SKETCHES......................................................... 15

E. BUDGET JUSTIFICATION............................................................... 20

F. SUPPORT LETTER ................................................................. 29
A. DATA ANALYSIS FROM ORIGINAL WAVE I FUNDING

CSUN – Math 103 – Business Mathematics

**Longitudinal grade data:** The grades from fall 2006 to spring 2012 as reported by Institutional Research show remarkable and steady improvement since Spring 2008 when the model with all its components and materials was first implemented. The red line shows students who received D’s, F’s or who withdrew. The Blue line shows students receiving A’s or B’s. The C’s are not represented. The curricular change is demarked by the dotted line.

The data for spring 2012 is available, but was not provided by Admissions and Records to Institutional Research in time to update the above graph. However, based on the preliminary data it appears while the median grade on the common final hit an all time high of over 80% this term, the number of students who gave up on the course and did not take the final increased. We will look into this further this summer.

**Pre/Post implementation final exam histograms:** Spring 2008 was the first time in which the model with all its components and materials was implemented. Results for the spring 2012 exam were even stronger, with the median score across all sections at 80% (highest to date).
Pre/Post Wave I final exam histograms: During the 2011-2012 academic year we revised most of the course materials for Math 103 to fit with the newly revised book. These materials were introduced in fall 2011, revised in winter 2012, and implemented in all sections in spring 2012. Below are the histograms for the final exam in spring 2011 and spring 2012. Comparing the two we see a right-ward shift indicating improved course mastery. In addition, new materials focused on improving exposition and practice in problem areas in Math 103. Chief among these were piece-wise functions and solving equations, and we saw the median score on the final jump from 8/10 to 10/10 on this problem.

Longitudinal Deeper Learning Outcomes: Mastery on deeper learning outcomes (DLOs) is measured by the aggregated score on final exam questions that are cumulative in nature (maximizing profit and elasticity). Here again we see steady improvement over time.
CSUN – Math 104 - Trigonometry

**History:** Math 104 was first offered at CSUN in spring 2003. From that time until fall 2011, the only common elements of the course were the final exam, textbook selection, and sections covered. During this time period no data on student performance was collected.

**New implementation:** In the spring and summer of 2011 new course materials were developed. These included selection of a new textbook, creation of correlated online homework exercises and quizzes, and creation of a lab workbook designed to support student mastery of essential skills and concepts. In fall 2011 the common elements of Math 104 were expanded to include:

- Use of online homework and quizzes
- Common grading of final exam
- Collection of final exam data (scores per test item per student)
- Basis of grading
- Lab Model - Students who earn less than a B in the prerequisite course must enroll concurrently in a one-unit lab designed to promote mastery of prerequisite skills as well as Math 104 coursework.

**Data:** Median final exam scores for fall 2011 and spring 2012 are summarized below. The consistency of scores from section to section and semester to semester is a positive sign. It suggests that instructors who implement the common elements of the course will have similar results.

**Median Final Exam Scores (out of 100)**

<table>
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<tr>
<th>Section 1</th>
<th>Section 2</th>
<th>Section 3</th>
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Median percent scores of final exam test items are summarized below. This data provides important information that will motivate the refinement of the course and thus improve student performance. Trends in test item scores show areas of student strength and weakness. Solving trigonometric equations (test items 9 and 10 in Fall 2011 and 8 and 9 in Spring 2012) as well as graphing tangent/cotangent functions (test items 6 in Fall 2011 and 5 in Spring 2012) are consistent areas of weakness. These areas can be improved with additional instructional time and emphasis, resulting in significant overall improvement.

**Median Percent Score Per Final Exam Test Item**

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<th>Test Problems</th>
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</table>
Longitudinal grade data: Despite moving to large lectures, under the Hybrid Model, grades from fall 2007 until spring 2012 in all sections of Math 115 show a noisy but steady failure (D, F and W) rate of about 40%, until a dramatic improvement that accompanied what we call “Prerequisite Ready” Testing, in spring 2012.

The effects of Professor X: Professor X is an enthusiastic participant in the Hybrid Model, but grades with wild inconsistency. When we remove his sections from the data we see a less noisy picture, with a more obvious improvement in the semester we implemented Prerequisite Ready Testing.
What happened in spring 2012?

Prerequisite Ready Testing: We believe that the timing by which we gave our exams was preventing students from learning the most challenging topics. Our new strategy is to test mid-unit, after the fundamental concepts but before the applications.

Prerequisite Ready Testing

![Graph showing difficulty levels and exam weeks]

With this strategy, students have studied the fundamental concepts in depth before they encounter the advanced content, and they have longer to prepare to be tested on the advanced topics.

Results: Problem-by-problem data in the period marked “Exam 3” above shows the improvement in student performance between spring 2011, during which we tested at the end of each unit (in the 5th, 9th and 13th week), and spring 2012, during which we implemented Prerequisite Ready Testing.

Percentage of Enrollment

![Bar chart showing percentage of tested students]

This data is from one large section in spring 2011 (172 students) and one large section in spring 2012 (170 students), taught by the same professor, with comparable exam problems and similar rubrics.
CSULB 113 – Pre-Calculus Algebra

When we started the Wave I grant in Math 113 we had a common course outline and a common textbook. With NGLC funding in fall 2011 we were able to add in:
- Uniform online homework (WebAssign)
- Supplementary Instruction for at most 25 volunteer students per section (through the LAC)
- All students complete individualized remediation (ALEKS)
- Two common problems on the final exam

Results from fall 2011
The rate of students receiving grades of A, B or C from fall 2011 is 79% among all students, and 78% among students receiving the Pell Grant. While this seems evidence of success, it is these students’ success in Calculus 122 and 123 that will indicate the success of the 113 program.

Identifying at-risk students in Math 113
During the first week of classes, students in Math 113 take a test, called an Initial Assessment, through the online tutoring system, ALEKS. We use the results on the Initial Assessment to divide 246 students from one section of Math 113 in fall 2011 into three proficiency levels: at-risk, intermediate and proficient.

By their performances on Exam 1, most of the students that we identify as at risk are indeed in need of advising and support. These students have an average score on Exam 1 of 68%, which is 10% lower than the average attained by the 246 students enrolled. In fact, 80% received a C, D or F on Exam 1. Figure 1 shows percentages of students in each of the three proficiency levels attaining each letter grade on Exam 1.

On the other end of the scale, the ALEKS Initial Assessment did a reasonable job identifying the proficient students, as well; 84% of the 109 students identified as proficient passed the first exam with a C or better, with 68% receiving a B or an A.

Exam Grades within Each Proficiency Level

This figure shows percentages of students in each proficiency level receiving each grade on Exam 1. Of the students we identify as at risk, 80% indeed received a C or lower on Exam 1.

New components added in spring 2012
Advising Workshops: reaching out to students with lower ALEKS scores
We added mandatory advising workshops in spring 2012 for students scoring lower than 50% on the ALEKS initial assessment. This identified about 70 students across the three sections as needing advice and guidance toward. Students were awarded 1% of their course grade for either achieving 50% on their initial assessment or...
attending the advising workshops. All 113 students regardless of their initial assessment scores were welcome at the workshops.

The goals of the workshops were to 1) help students connect with resources from within their colleges, including the college advisors, and 2) advertise the opportunity to participate in Supplementary Instruction, and other services offered by the Learning Assistance Center (LAC). A representative from the LAC, as well as an advisor from the College of Engineering and the College of Natural Science and Mathematics, and a representative from the School of Art and Sciences center each participated in delivering five one-hour workshops.

In organizing the workshops, we furthered collaboration between the Math Department, the college advisors from both science and engineering, and the LAC, which felt productive, and will certainly be continued. Unfortunately, but not surprisingly, less than half of the 70 students we invited chose to attend a workshop. In fall 2012, we plan to try to have all students participate in the workshops by visiting the large lectures during the first week of classes.

New components to be added in fall 2012
Following our work in Math 115, we plan to implement the following activities in fall 2012, focused on adding guidance for students’ independent, outside-of-class work through Off-line Homework, and adding a focus on productive study habits by requiring notebooks.

- Hold an in-class advising workshop featuring visitors from the LAC, College of Engineering, College of Natural Science and Mathematics and the Math Department. (This expands our workshops for at-risk students from fall 2011 to reach all Math 113 students.)
- Off-line homework
  - Required write-ups of select online homework problems
  - Spot-checked for completeness and correctness during weeks with midterms
- Graded notebook of course materials
  - Students are required to have an organized binder that includes lecture notes, off-line homework, activity worksheets
  - Each notebook and off-line homework check receives course credit
- i>Clickers
  - Some sections of Math 113 will use i>clickers to encourage attendance and engagement during class.

HSU Math 115 and LAPC Math 115
Humboldt State University (HSU) did excellent work on materials, prototyping all those necessary for the planned implementation in fall 2012 of Math 115, HSU’s only Pre-Calculus course: lecture notes, supplemental instructional exercises, online homework, and ALEKS remediation. At its own initiative, Los Angeles Pierce College (LAPC) piloted a prototype of Intermediate Algebra (Math 125), but without the separate lab, in preparation for planned implementation of the redesigned Math 125 course in fall 2012. While there was some improvement in student performance in that experiment, the results underscored the importance of applying the model’s structure of separating group work from classwork.
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<th>Institution Type</th>
<th>Course Name</th>
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<th>Year</th>
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<th># Completed Course (received a grade)</th>
<th># Persisted to Next Semester</th>
<th># Mastered Subj. Matter (grade of C or better)</th>
<th># Measured Deeper Learning</th>
<th># Mastered Deeper Learning</th>
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**Full Course Titles**

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Note: Percent achieving deeper learning is based on the number of students getting 66% on the final as a percent of the total number of students who took the commonly graded common final.
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<th>Institute Type</th>
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Full Course Titles

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C. SCOPE OF WORK FOR FOLLOW-ON FUNDING

For its next phase of development, the Hybrid Labs for Core GE Courses project proposes to build upon our 2011-2012 Wave I accomplishments and experiences. For the original consortium members, NGLC’s continuing support will make possible scaling the model to more courses; providing more instructor training and more classroom facilities; improving assessment; providing professional and student staff salaries; and improving data collection and analysis. Additional support will fund scaling of the hybrid lab model to the two new campuses in our consortium, CSUMB and CSUCI. CSUN will lead the proposed consortium-wide projects. These, as well as specific plans for individual campuses, are summarized below; costs are reflected in the Budget sections.

**CSU – Consortium-Wide Projects**

1. **Consortium-wide Projects**
   a. **Aggressively recruiting new consortium member campuses** from within the CSU and CCCs (Grant Manager, CSU CO representative to advisory board, Math Council representatives to advisory board, Katherine Yoshiwara)
   b. **Creating the Hybrid Model Resources Repository (HMRR).**
      - Class materials - Developmental Math, College Algebra, Trigonometry, Chemistry (Stevenson, Crosswhite, Nemeth)
      - Training Tools - Coordinators, instructors, staff, graduate students and tutors
      - Assessment Tools - Data management tools to collect and compare: final grades in past, current, and subsequent courses; scores on exams, homework, and remediation; and student background information. (Crosswhite & Stigler)

**CSUN – Labs for Lower-Division Math Courses**

**CSUN Courses**

- **Math 102**: Create course materials to complement the hybrid lab structure in place for Math 102. These will include: Lecture notes, lab workbook problems, common homework sets, common remediation, common final exam.
- **Math 103**: Refine course materials developed in AY11-12 under Wave I funding.
- **Math 104**: Refine course materials developed in AY11-12 under Wave I funding.
- **Developmental Math/Math 092 (Spring)**: Refine CSUN-created materials, accelerated Spring 092 sections. These include: lecture notes, workbook problems, common homework sets, common final exam. We will hire addition tutors to facilitate group work in those sections.

**CSUCI – Labs for Lower-Division Math Courses**

**CSUCI Summary:**

This project will allow Channel Islands to design and implement technology-based curriculum for multiple sections of lab/tutorial session for Pre-Calculus, Calculus, Statistics and more advanced mathematics courses. Eight Lab/tutorial sessions will be offered in AY 12/13 and available Monday, Tuesday, Wednesday and Thursday. Each 1.5-hour section will be led by an instructor with instructional student assistants (ISA) who will also provide tutoring services in a computer lab setting. Lab/tutorial sections will infuse technology into the curriculum such as Maple, Excel, SPSS and Internet solutions (including graphing, problem solving, testing, and working with computational tools and educational games). These sections will be offered at different times and will focus on supporting specific mathematics courses that serve as a gateway to science or business majors, as well as a foundation for mathematics, physics and computer science, i.e., Pre-Calculus, Calculus, Statistics and more advanced math courses. Each course lab will enroll about 60 CI students, who will attend sessions regularly or on an as-needed basis. Since the majority of students come to these courses with weak mathematical skills, they have a better chance of succeeding with the systematic, professional help of qualified faculty and instructional student assistants in a familiar environment and with consistent academic support. We thereby expect to improve passing rates in mathematics courses for students who participate in lab/tutorial sections.
CI will make reasonable efforts on the following Project Deliverables:

- Develop and implement curriculum for lab/tutorial sections.
- Offer 8 lab/tutorial sections in Pre-Calculus, Calculus, Statistics and more advanced mathematics courses (serving approximately 60 students per related courses).
- Hire 8 Undergraduate Instructional Student Assistants.
- Train Undergraduate Instructional Student Assistants and faculty to carry out lab/tutorial sections.
- Collect and analyze data on impact of lab/section use.
- Meet with CI mathematics faculty to review impact and develop plan for continuous improvement.

CI will collaborate with CSUN, CSUMB, and other partnering institutions on various elements of the project. CI will also share information with faculty at partnering community colleges about the hybrid model, to promote its adoption as a means to improve math education and the academic success of transfer students.

CSUMB – One Course

CSUMB proposes to offer a pilot section of Pre-Calculus using the hybrid model in fall 2012. The hybrid course will focus on the development of habits of mind (e.g., persistence, engagement and motivation). This includes group work/presentations, supplemental instruction with math games and real-life mathematical situations, and individualized online remediation/quizzes for each student. Dr. Hu, will pilot a section of Pre-Calculus with 65 students by using the hybrid model. He plans to compare performance in this section to those of other sections. In spring 2013 Dr. Hu expects that all sections of Pre-Calculus at CSUMB will be implemented with the hybrid model:

- **Engage in-class interactive lecture:** Dr. Hu will integrate Tablet PCs and the Classroom Management Software in the pilot section. Peer Tutors will serve in classrooms and labs so they can provide immediate assistance to students who need help; each tutor is personally responsible for tracking the progress of 30-35 students from their class/lab.
- **Develop an online student response system** for the daily quiz/test so the instructors can identify patterns of student responses and create lesson exemplars to address misunderstandings.
- **Share/expand the hybrid model with the community college partners.** Dr. Hu will work with faculty at Cabrillo and Hartnell Colleges to foster the hybrid model’s adoption. Faculty at CSUMB will collaborate with partner colleges’ instructors to implement learning strategies, develop frameworks for analyzing student performance, and create supplementary materials for classroom instruction.

CSULB - Six Courses

CSULB Summary Math 115: CSULB proposes to continue use of the hybrid model in Math 115 Business Calculus (500-700 students per semester), with activities focused on advising, study habits, and content mastery. Proposed new changes are these:

- **New practices,** based on 2011-12 experiences:
  - Students in each Lab will attend the same large lecture session rather than choosing one.
  - Newberger and Chang will create a coherent set of exercises in a new Lab Workbook, from which the large lecture instructors will select problems for students to solve during that week’s Lab.
  - Training of teaching assistants (TAs) who teach Labs will be revised, to improve their pedagogy and communication with their students and with the large-lecture instructors. Guided by Chang and Barbee (each teaching a large lecture), the other instructors will communicate weekly with TAs, to relay the content and exchange results of each Lab. TAs will have an initial training before the semester begins and will attend follow-up sessions during the semester in which Learning Skills Specialists from CSULB’s Learning Assistance Center will join Newberger and Chang.

- **Revisions to the Individualized remediation.** Newberger will use tools within the ALEKS software (“scheduled assessments”) to identify and remediate important topics in a timely manner.

- **Prerequisite Ready” Testing.** Barbee will adjust the course outline to accommodate the “Prerequisite Ready” testing schedule, first piloted in spring 2012, and enable the students to reflect on the topics most important for transfer to later courses and to improve their final exam performance.

CSULB Summary Math 113: CSULB proposes to continue use of the hybrid model in Math 113 Pre-Calculus Algebra (500-700 students per semester), with activities focused on advising, study habits, and content mastery.
We propose the following changes to our program. The challenge this year will be to adapt the model to accommodate exploding class sizes caused by budget cuts. Newberger will explore variations on the model including voluntary supplemental instruction and folding remediation into the parent class.

- **Off-line Homework.** Math 113 lacks a Lab session, except for 25 students per large lecture who volunteer to participate in Supplementary Instruction. Following successful practices in Math 115, Newberger will create Off-line Homework sets, consisting of problems similar to those in the online homework, for which students write out solutions. While not a Lab, these structured assignments will help all students get additional guidance.

- **Revisions to the Individualized remediation.** Newberger will use tools within the ALEKS software (called “scheduled assessments”) to identify and remediate important topics in a timely manner.

- **“Prerequisite Ready” Testing.** Following successful practices in Math 115, Newberger will change the course outline to accommodate the “Prerequisite Ready” testing schedule, in which the midterms are given mid-unit, after the fundamental topics, and before the more challenging topics.

- **Advising Workshops.** A session during the large lectures dedicated to advising will replace advising sessions targeting at-risk students. Advisors from the colleges of science and engineering and representatives from CSULB’s Learning Assistance Center will participate.

- **Lecture Notes.** Newberger will create Lecture Notes aligned to the other course materials, for eventual implementation across all sections.

- **Common Exam Problems and Deeper Learning Outcomes.** With Suaray’s help, Newberger will continue to coordinate large-lecture instructors to implement common exercises to include on the final exam, and facilitate the collection of data monitoring students’ Deeper Learning Outcomes.

**CSULB Summary, General Chemistry Sequence Chem 101, 111A, 111B:**

CSULB proposes to continue use of the hybrid model in Chem 101 (Remedial Introductory Chemistry, 400-500 students per semester), Chem 111A (1st Semester General Chemistry, 500 students per semester) and Chem 111B (2nd Semester General Chemistry, 350 students per semester) with activities focused on advising, study habits, assessment-informed content changes, and content mastery based on national standards as defined by the Committee on Professional Training of the American Chemical Society (ACS).

Chem 101 is a 10-week preparatory course developed at CSULB, with unified curriculum content and assessment tools. The goal was to align the topical coverage of the course with the topical coverage of the Chemistry Placement Test (CPT). An appropriate CPT score (24) is now uniformly required for all students to move to higher-level chemistry courses. National data indicate that more than 80% of students with scores >24 on CPT successfully complete a 1st semester general chemistry course. Chem 111A is a standard 1-semester course in general chemistry for science majors consisting of 3 hours of lecture, 4 hours of laboratory, and 2 hours of recitations per week. Chem 111B is a second-semester general chemistry course for science majors focusing on the topics of solutions, kinetics, equilibria, thermodynamics, electrochemistry, and nuclear chemistry. This course applies the fundamental chemical knowledge obtained by the students in the first half of their General Chemistry curricula. To ensure that our passing General Chemistry students are best prepared for their future science courses, we utilize the ACS standardized General Chemistry exam as the Chem 111B final, which covers the entire year-long curriculum.

CSULB proposes the following activities for the AY 2012-13 in the general chemistry sequence.

- We will conduct preparatory exercises for teaching assistants who teach course recitations. Prospective TAs will participate in a workshop including a 15-minute videotaped mock discussion lead by a TA. The taped presentations will be analyzed and discussed with a faculty member.

- We will administer mid-semester teaching evaluations of TAs, to give the TA better feedback regarding their classroom performance.

- Externally administered Chemistry Placement Test will be used at the end of 10 week-long Chem 101.

- Item-analysis of CPT results will be performed to identify weak content areas and to modify Chem 101 content.

- We will use tools within the ALEKS software to identify and remediate important topics in a timely manner with particular emphasis on algebra skills in Chem 101 and on nomenclature and stoichiometry in Chem 111B.

- In collaboration with department advisors, the College Advising Center and the course instructors, we will implement an “early warning” system for underperforming students (automated emails notifying
students on available resources/mandatory advising). Tutoring and workshops focused on study skills and time management will be offered to these students.

- We will develop recitation sections in Chem 111B to improve students’ problem-solving skills. A worksheet (common for all recitation sections) will be developed to practice problem-solving skills.
- Item analysis of the Chem 111B final exam (2-year standardized ACS final exam) indicates that students perform relatively poorly on several topics—probably due to a time gap of a year or more since these topics were last covered in class. We will use ALEKS in CHEM111B to allow students to re-learn these important topics concurrently with their new material. This self-paced approach for past material will allow students the ultimate time flexibility, while ensuring that they achieve the global mastery level of Chemistry desired at this level.

HSU – One Course

HSU Summary:
HSU will offer three pilot sections of Pre-Calculus (Math 115) in fall 2012 using the hybrid model and course materials developed during AY 2011-12. The hybrid course will integrate online self-remediation, online homework, printed lecture notes, carefully designed discussion section problem books, and examination problems that are closely aligned with the discussion and homework problems and designed to measure deeper learning of core concepts in Math 115. Undergraduate student instructional assistants will provide peer tutoring assistance in the discussion sections alongside the course's faculty instructor.

Dr. Mazzag will teach one of the three pilot sections of Math 115 with 120 students using the hybrid model and materials as well as coordinate the other two sections taught by full-time lecturers. One section of Math 115 will be taught outside of the model for comparison purposes. In spring 2013, two of three Math 115 sections at HSU will be implemented with the hybrid model.

LAPC – One Course

LAPC Summary:
In fall semester 2012, Pierce proposes to offer three sections of Intermediate Algebra (Math 125) and three sections of Elementary Algebra (Math 115), each with a 1-unit lab taught by an adjunct instructor and assisted by a tutor in the classroom. The labs will use materials developed by the Math Department, building on materials already in use in our MAP (Modeling with Algebra Project) course.

In spring 2013, we will incorporate similar 1-unit labs into two sections of our combined elementary/intermediate algebra course (ASAP). In addition, we will offer two sections of a new pre-algebra course, each with a 3-unit lab. Materials for this new course are being developed now, and some have been class-tested this semester. Performance in these classes will be compared with performance in traditional sections of the courses.
D. BIOGRAPHICAL SKETCHES

CSUN

James Castro (M.S. Mathematics, CSUN, 1982) is a full-time lecturer in the Math Department. As a member of the proposed project’s instructional team, he will be the lead instructor in Math 104. His work has focused on education and developing instructional models for at-risk students and for courses with low pass rates. He has experimented with numerous instructional technologies and methods for delivering instruction. He trains and mentors graduate teaching associates as well as part-time instructors. Currently, he is the course coordinator for College Algebra and Trigonometry. His latest project is the development of a one-unit lab designed to address the generally poor preparation of students in College Algebra. He has received numerous teaching honors and awards.

Michael Crosswhite (M.S. Statistical Genetics, Washington University in St. Louis, School of Medicine, 2001; M.S. Mathematics, Missouri State University, 2006) will be a member of the CSUN instructional team for Math 102 and 103. He has been an instructor teaching College Algebra, Mathematical Methods for Business, Introduction to Statistics, Applied Statistics, and Calculus III at CSUN. He has several publications addressing the genetic components of disease and has also worked in industry as a statistical analyst in marketing. With Katherine Stevenson, he is analyzing data on outcomes for the Math 102, 103, and 104 courses at CSUN.

Werner Horn (Ph.D. Mathematics, UCLA, 1989) chairs the Mathematics Department. He will be a member of the project’s instructional team, overseeing the implementation of curriculum adjustments. His experience as chair and former member of the Curriculum Committee will contribute greatly to the project’s implementation.

Andrea Nemeth (M.S. Applied Math with an emphasis on Statistics, CSUN, 2007; B.S., Applied Math and Statistics, summa cum laude, CSUN, 2005) will be a member of the CSUN instructional team for Math 103, and will work in the consortium-wide training, assessment, and “to-do-list” efforts. She is an instructor and tutor coordinator in the Mathematics Department and Developmental Mathematics Program. She was a Fellow of the National Science Foundation-funded FERMAT program, which places math graduate students (fellows) in local public middle schools as teachers’ aides, and was subsequently hired as the FERMAT grant program manager. Her responsibilities included training new fellows, supervising them in schools, working with the teachers in the program, and assisting the program evaluator with data analysis. Her teaching experience at CSUN includes large-section and hybrid introductory statistics courses, and a graduate course in probability and statistics for in-service teachers. She wrote a 200-page workbook for the hybrid Introductory Statistics course with colleague Dr. Mark Schilling. She was named Outstanding Part-time Instructor in 2009.

Katherine F. Stevenson (Ph.D. Algebraic Geometry, The University of Pennsylvania, 1994) is a professor of Mathematics and proposed Hybrid Model Continuation Project PI and CSUN lead. Since August 2009 she has been the director of the CSUN Developmental Mathematics Program. In that capacity she oversees courses for 2500-3000 students and supervises 25-30 instructors, 50-70 tutors and 3 staff members on a budget of approximately $1.5 million. She has 16 years of experience teaching university-level mathematics and received the CSUN and College of Science and Math outstanding teaching awards in 2008. Stevenson developed the prototype hybrid model for CSUN’s Business Math course (Math 103), and presented its success at several professional venues (Gates Foundation, NGLC Convening, AMS, CSU system-wide conferences and senate meetings, CSUN faculty retreat, Project NExt). She has collaborated extensively on the Math 103 course materials with W. Watkins, including the Wave I project to replace the commercial textbook with a Reader. She has also collaborated with proposed consortium lead F. Newberger when the model was implemented at CSULB; with B. Yoshiwara (LAPC) on Statway; and with M. Rizzardi (HSU) on the CSU Chancellor’s Early Start Initiative.

James W. Stigler is a professor of Psychology and Associate Dean for Research and Innovation at UCLA, and a Senior Fellow at the Carnegie Foundation for the Advancement of Teaching. He was director of the TIMSS video studies, and founder and CEO of LessonLab. He has authored numerous articles and books, including The Teaching Gap (with James Hiebert, Free Press, 1999/2009) and The Learning Gap (with Harold Stevenson,
Simon & Schuster, 1992). He received his A.B. from Brown University (1976), a master’s in Education from the University of Pennsylvania (1977), and a Ph.D. in Developmental Psychology from the University of Michigan (1982). He has received numerous awards for his research, including a Guggenheim Fellowship and the QuEST award from the American Federation of Teachers. He is best known for his observational studies of mathematics and science teaching, and has pioneered the use of multimedia technology for the study of classroom instruction. He will guide the development of analysis tools for comparing the effects of model components across the consortium.

**William Watkins** (Ph.D. Mathematics, UCSB, 1969), a professor of Mathematics, has been teaching college mathematics for over 41 years. He will serve on the project instructional team. He is part of the group that has been fundamental in developing the Math 103 materials and is co-author of the Math 103 Reader with Dr. Stevenson. He has been co-editor of the *College Mathematics Journal* (1989-1994), one of three expository journals published by the Mathematical Association of America. The CMJ focuses on the first two years of college mathematics. He was editor-in-chief of the *Journal of Linear and Multilinear Algebra* (1992-2008). He is the author of over 50 published mathematics papers, several of which have appeared in expository journals: *The American Mathematical Monthly*, *Mathematics Magazine*, and *College Mathematics Journal*.

**Math 102 coordinator, TBA**

**CSUCI**

**Ivona Grzegorczyk** (Ph.D. Mathematics, UC Berkeley, 1990) professor and chair of Mathematics, has over 20 years of mathematics education experience, including educational software development, curriculum design and numerous research articles and presentations. She has worked with local school districts and community colleges on various educational projects and has received numerous grants. She will organize the implementation of the model in the Math Labs and coordinate with the campus administration, the IT department, and the CSUN and consortium partners. She will work on developing the CSUCI project materials and training for the faculty and student assistants. She will work on the project year-round and will be responsible for assessment of the impact of the proposed labs on student performance, data collection and analysis. She will also collaborate with local community colleges to try to bring the same reforms to those institutions. The goal is to have similar curricular experiences for CSUCI native students and transfer students from local community colleges.

**Roger Roybal**, (Ph.D. Mathematics, UC Santa Barbara, 2005) is the proposed tutor supervisor. He has served as faculty in the Math Tutoring Center and was the Mathematics Labs coordinator for the past seven years. He will oversee the daily operations of labs and the student assistants, and will instruct students in one of the labs. He has developed the technology-based curriculum for the Math Department using a program called MAPLE and he has developed the curriculum for the Calculus labs. He will work on the project during academic semesters.

**CSULB Mathematics**

**Ladera Barbee** (M.S. Mathematics, CSULB, 1988) will serve on CSULB’s project instructional team. She has been a full-time professor of mathematics at Long Beach City College since Fall 2000, and adjunct math faculty at CSULB since 1988. She has taught Math 115 in the CSULB hybrid program since its inception, and has played a critical role facilitating revisions and coordinating activities. At LBCC, she directs the Success Center, which is focused on improving developmental students’ success and retention rates. There, she manages more than 50 employees and a budget of $500,000, and coordinates activities of more than 70 instructors per semester. The center was originally funded by the California BSI (Basic Skills Initiative), and she has served the program since the planning phase. She has also played a major role in a U.S. Department of Education Fund for the Improvement of Post-Secondary Education (FIPSE) project.

**Florence Newberger** (Ph.D. Dynamical Systems, University of Maryland, 1988), an associate professor of Mathematics in CSULB’s Department of Mathematics and Statistics, will coordinate the implementation of the Hybrid Model at CSULB. She will also advise the program in chemistry and manage the implementation in mathematics. She has 16 years of mathematics teaching experience at the University of Maryland, Penn State.
University and CSULB. She was a fellow in MAA Project NExT (a professional organization connecting new mathematics faculty from campuses nationwide and providing support for activities in teaching, research and service) in 2001-2002, and since 2005 serves on the board of the MAA's Southern California-Nevada Section. In 2006 she received the CSULB Distinguished Faculty Teaching Award. Since 2005 she has served the Math Department as Mathematics Service Course Coordinator, setting the curricula for certain 100-level courses required by other majors as well as those serving only a general education audience, such as 115 Business Calculus (1000 students taught by instructors of six large sections and 30 labs per year), 119A and 119B Calculus for Biology (1000 students, taught by instructors of 22 small sections each year), and 109 Modeling with Algebra (750 students taught by teaching assistants in 22 sections per year). In 2007, she designed the new Math 109 course to include writing and spreadsheet assignments, to meet the needs of students whose major does not require mathematics. Using her experience with this course, she wrote the Study Guide for the textbook College Algebra, Concepts and Contexts by Stewart, et al. (2010, Brooks Cole publisher, ISBN-13 978-0495387916). Beginning in 2008, she has cooperated with the School of Business to align the content of Business Calculus with the business major's curriculum, and since fall 2009, she oversees the implementation of the course design initiated at CSUN by Dr. Stevenson in all sections of Business Calculus, developing the course outline, labs, and online homework addressing the needs of the CSULB business major.

Robert Mena (Ph.D. Mathematics, University of Houston, 1973) is a professor in the Department of Mathematics and Statistics, where he has also served as chair since 2005. He will be a member of the CSULB project’s instructional team. He has been in California since 1988, after 15 years at the University of Wyoming, also serving as chair. He has visited at Ohio State University, Caltech and Emory University. At CSULB he participated actively in the bifurcation of the pre-baccalaureate algebra curriculum, which has increased the passing rates of students needing developmental mathematics.

Kagba Suaray (Ph.D. Statistics, UCSD, 2004) will serve in Spring 2013 as a data analyst for CSULB. He is an associate professor in the Department of Mathematics and Statistics. His specialty is nonparametric statistical methods, and he has worked on the analysis and report writing of a number of consulting projects. In addition, he is the director of the CSULB Upward Bound Math Science program, equipping low-income, first-generation, and underrepresented high school students for college admission.

CSULB Chemistry:
Chris Brazier (Ph.D. University of Southampton, 1982), will direct the multifaceted chemistry component of the project including data collection and analysis, teaching assistant training and administration of mid-semester teaching evaluations. He is a professor of Chemistry and department vice-chair. He has significant experience teaching general chemistry and physical chemistry. He has coauthored more than 50 research papers in the area of gas-phase spectroscopy.

Jen-Mei Chang (Ph.D. Mathematics, Colorado State University, Fort Collins, 2008) is an assistant professor in the Department of Mathematics and Statistics. She has taught a wide spectrum of undergraduate- and graduate-level applied mathematics courses, and advises master’s-level students. She is a co-director of the CSULB Physical Science and Mathematics Scholarship Program and is also responsible for maintaining its official website. Chang’s research focuses on the understanding and modeling of large data sets using geometric methods with a special emphasis on pattern recognition and image processing. She has also authored papers in mathematics education and is very keen on developing programs that facilitate student learning in the classroom.

Andrea Chen (MS Chemistry, CSULB, 2004) is a Chemistry lecturer teaching in Chem 101 and 111A lectures and laboratories in general and organic chemistry. She has introduced substantial curricular modifications in Chem 101 over the last 3 years.

Shahab Derakhshan (Ph.D. Chemistry, University of Waterloo, 2005) will coordinate the Math 111A implementation. He is an assistant professor of chemistry and is the Chem 111A coordinator. He has taught across the undergraduate and master’s-level courses in inorganic and general chemistry. His research, funded by the Department of Defense and Research Corporation, is in synthesis, crystal structure determination, electronic structure calculations and physical properties measurement of functional materials.
Nancy Gardner (MS Chemistry, CSULB, 1997), will coordinate the Math 101 implementation. She has taught lecture and laboratory courses in general chemistry and is a Chem 101 coordinator. She coauthored chemical text and several publications and presentations on iron porphyrins, development of a novel chemistry course for preservice teachers, and the use of I-tunes in the chemistry classroom. She was recently honored for her role in the video series "Understanding Chemistry in Our World," which won a 2010 Emmy Award for Best Instructional Series.

Jean Lee-Lin (Ph.D. Chemistry, University of Southern California, 1988) will participate in development of common recitation/lecture materials in Chem 111A and data analysis. She is a Chemistry lecturer teaching Chem 111A lecture classes and organic chemistry laboratories. She has extensive experience in teaching general chemistry both at CSULB and at Long Beach City College.

Stephen Mezyk (Ph.D., Chemistry, University of Melbourne, Australia, 1990) will coordinate the Math 111B implementation. He is a professor of Chemistry and is the Chem 111B coordinator. He has taught across the undergraduate and master’s-level courses in general and physical chemistry. His research, funded by more than $3M in grants from Department of Energy and other agencies, is focused on Environmental Remediation of Contaminated Waters, Atmospheric Ozone Depletion Chemistry, Kinetics and Mechanisms of Small Radicals in Solution, Supercritical Fluid Chemistry, and Chemistry of Cancer. He has received both the Distinguished Faculty Teaching Award and the Distinguished Faculty Scholarly and Creative Achievement Award.

Marjan Mohammadi (MS Chemistry, University of Waterloo, 2005) will participate in the development of common recitation/lecture materials in Chem 111A and data analysis. She is a Chemistry lecturer teaching Chemistry 111A lecture classes and general chemistry laboratories.

CSUMB

Hongde Hu (Ph.D. Mathematics, McGill, 1993) is active in mathematics and mathematics education research. He has over 15 years of progressively responsible experience working with minority students, low-income, and underrepresented populations in the STEM disciplines. He serves as the Principal Investigator for a Lumina Minority Student Success Initiative grant, and is nationally recognized for his efforts in building learning communities in mathematics that incorporate mobile technology to create a dynamic and visually engaging classroom experience. He received an Education Technology Innovators Award in Fall 2010 from Hewlett-Packard and the New Media Consortium, and was the recipient of the President’s Medal as Outstanding Faculty at CSUMB. As a co-PI, Prof. Hu will oversee all aspects of designing, implementing, and directing the Hybrid Model project at CSUMB; and will serve as the main liaison to CSUMB and to the consortium partners’ departments, faculty, administrators, and students.

Jonathan Baptista, an I.T. Specialist/project coordinator for the Wireless Education and Technology Center/WeTEC, has 12 years’ experience in hardware and software implementation and maintenance, and has mastered building many different computers to serve the user’s specific needs. He will be responsible for faculty and student training in the use of Tablet PCs as well as for maintaining the equipment.

Alysia Walther (MS Mathematics Education, UC Santa Cruz, 2009), full-time math lecturer, has been serving since 2009 as the coordinator in the Developmental Math Program at CSUMB, providing instructional services/materials for remediation. She has extensive experience in collection and analysis of data to evaluate the labs’ infrastructure, services, resources, and effects on student outcomes. Her roles and responsibilities will be to coordinate all faculty development institutes and collect all data for the evaluator.

HSU

Tyler J. Evans (Ph.D. Mathematics, UC Davis, 2000), proposed co-PI and HSU Math Department chair, is an associate professor of Mathematics with over 10 years’ experience teaching university-level Calculus and Pre-Calculus courses. He has extensive experience with the use of the Web-based technologies employed in large
lecture Pre-Calculus courses at HSU. As a member of the California State University Transforming Course Design: Developmental Mathematics taskforce, he gained valuable experience in technology-based course redesign and assessment. He has experience working collaboratively with colleagues across the CSU in designing, scaling and implementing technology-based mathematics placement tests.

**Borbala (Bori) Mazzag** (Ph.D. Mathematics, UC Davis, 2002), proposed lead for Math 115, is an associate professor of Mathematics at HSU. She works in mathematical and computational cell biology, and advises both master’s-level and undergraduate student researchers. She has several publications and presentations co-authored with students. She has extensively collaborated with Biology and Psychology faculty members at HSU on interdisciplinary research and teaching projects. She received a California State University Program for Education and Research in Biotechnology (CSUPERB) Programmatic grant in 2010 to develop and teach an introductory mathematical modeling course for Biology students; she developed and team-taught the course in spring 2011. She has also team-taught "Cellular Neuroscience," an upper-division Biology/Psychology course with faculty from both disciplines. She teaches mathematics courses across the curriculum, including Pre-Calculus (Math 115) and Calculus courses, and upper-division and graduate courses in applied mathematics.

**Michael Stobb**, a teaching associate in Applied Mathematics, is the proposed data specialist at HSU. He has been teaching various math courses part-time for nearly 3 years. He recently taught a section of remedial algebra in the “flipped” classroom style, the first of its kind at HSU. He has extensive experience with database creation, management, and statistical analysis, both academically and professionally. He will be responsible for project data maintenance and data analysis.

**LAPC**

**Bruce Yoshiwara** (Ph.D. Mathematics, UCLA, 1988), Math Department chair, will serve on the LAPC project instructional team. He currently serves on the advisory board of MathDL, the executive board of AMATYC and CMC^3-South, and is one of the 19 educators recommended by the Instructional Quality Commission to serve on California’s Curriculum Framework and Evaluation Criteria Committee. He has received teaching awards from the American Mathematical Association for Two Year Colleges (AMATYC), the Mathematical Association of America (MAA), and the Academic Senate of California Community Colleges.

**Katherine Yoshiwara** (M.A. Mathematics, UCLA, 1977), professor of Mathematics, will be the co-PI and LAPC’s lead in the proposed Hybrid Model project. She has been active in curriculum reform efforts for many years, and was part of the Harvard Consortium for Higher Education. She has received teaching awards from both AMATYC and the MAA. She is the author of a series of developmental math textbooks, including the test for Pierce’s award-winning ASAP program. She currently serves on the MAA’s Committee for Undergraduate Programs in Mathematics and the American Institute of Mathematics editorial board for open-source textbooks.
E. BUDGET JUSTIFICATION

Total funds requested: $3,669,068

Budget overview by budget period:

Period 1: January 1, 2013 - June 30, 2013: 11 courses at 6 campuses with one lab project.
Administrative & Campus Projects: $660,341.74
Lab Construction: $210,000
Indirect: $87,034.17
Total: 957,375.91

Period 2: July 1, 2013-Dec. 31, 2013: 10 courses at 9 campuses and one computer lab construction project (some projects will have matured to the point that they do not require further funding).
Administrative & Campus Projects: $352,288.75 (10 x $30K for half the year)
Lab Construction: $200,000
Indirect: $55,228.87
Total: $607,517.62

Period 3: January 1, 2014-June 30, 2014: 10 courses at 10 campuses (some projects will have matured to the point that they do not require further funding).
Administrative & Campus Projects: $450,000 (10 x $30K)
Indirect: $55,228.87
Total: $387,493.42

Period 4: July 1, 2014-Dec. 31, 2014: 10 courses at 10 campuses (some projects will have matured to the point that they do not require further funding).
Campus Projects: $450,000 (10 x $30K for half the year)
Lab Construction: $200,000
Indirect: $35,333.97
Total: $388,673.72
**CSU-Consortium**

Grant Manager - $100K January 1, 2012 to December 31, 2013 (100% time), 50% time for July 1, 2014 - December 31, 2014.
Web Development Consultant - $20,000 per year
Advisory Board Members - $10,000 per year for honoraria
1. CSU CO representative
2. Council of Math Chairs Representative 1
3. Council of Math Chairs Representative 2
4. External Evaluator
5. Data Specialist
Travel - $1,500 per year
Food - $300 per year

**CSU-Campus Projects**

The budget details for the funding period January 1, 2013 to June 30 2013 are below. All salary information is accurate as of August 31, 2012, but is subject to change. The Grant Manager will review revisions of any budget information. NGLC will be consulted on issues that exceed 10% of the originally proposed amount or which require changes between funding categories.

Funding in July 2013 - June 2014 and July 2014 - June 2015 will be determined by the Advisory board in coordination with NGLC. The board has not only the responsibility to aggressively recruit new consortium members, but also the responsibility to vet the new recruits. New projects must be for courses that help solve a chronic problem with gateway and bottleneck courses. That is, they must be:
1. Introductory where prerequisite math knowledge is fundamental
2. High enrollment
3. Multi-section
4. High failure rate

Proposed solutions must include:
1. Common course materials
2. Supplemental instruction for at risk students
3. Tailored remediation for at risk students.
4. Common assessment tools

In general, funding for a new implementation in one course should last two years and cost approximately $50,000-$70,000 per year. This will cover release time for the faculty lead(s) to concentrate on course material development, university administrative steps to course revision, and coordination activities. The amount may vary as the cost of release time varies with the faculty member’s salary. Additionally, funding will cover funding for assistance to the faculty lead in the form of a data specialist, graduate assistants, and undergraduate tutors.

In the case of an established implementation of the model, funding may be requested for upgrading and constructing flexible instructional space (cf. CSUN’s request for 2012). These will be on the order of $250,000.
Detailed Budget Justification for January 1, 2013 - June 30, 2013

CSUN

Total funds requested: $557,462

Personnel and Benefits:

Mr. James Castro, MS Mathematics – Math 104 Coordinator - Review and revise Math 104 lecture notes, lab workbook, homework problems, and exam test bank.
$59,196 AY 12/13 salary x 25% (6 units course release) = $14,799
.5 months (summer break in 2012) = $3,289

Mr. Michael Crosswhite, MS Statistics – Data Analyst
$42,432 AY 12/13 salary x 41.67% (10 units course release) = $17,680
1.5 months (winter/summer breaks in 2012/2013) = $7,072

Dr. Katherine Stevenson – Grant Principal Investigator
$78,864 AY 12/13 salary x 25% (6 units course release) = $19,716
1.5 months (winter/summer breaks in 2012/2013) = $13,144

Dr. William Watkins – Math 103 Coordinator - Review and revise Math 103 Reader, lecture notes, lab workbook, webwork problems, and exam test bank.
$114,108 AY 1.125 months = $14,264

Course Coordinator Math 102 – Math Faculty - Create Math 102 lecture notes, lab workbook, homework problems, and exam test bank.
$75,000 AY 12/13 salary x 25% (6 units course release) = $18,750
1.5 months (winter/summer breaks in 2012/2013) = $12,500

Course Coordinator Math 092 – DMP Faculty - Review and revise Math 092 lecture notes, lab homework, webwork problems, and exam test bank.
$36,000 AY 12/13 salary x 25% (6 units course release) = $4,500
2 month (winter/summer breaks in 2012/2013) = $8,000

Grant Manager – We will recruit a fulltime grant manager to oversee the day to day administrative aspects of the project and serve as liaison with member institutions. The grant manager will work with the PI and the Advisory Board and serve as an administrative resource for both continuing and new institutional members.
$100,000 CY 2013 @ 100% time = $100,000

Graduate Student Assistants (ISA) - Will help with editing course materials and data analysis. Summer and Winter stipends = $ 5,400

Fringe benefit rates – Specified in budget.

Travel & Accommodations - Funds will be used for in-state travel to meetings with university partners and local community college collaborators. Funds will also cover travel expenses of advisory board meetings for biannual meetings – $5,242

Other Direct Costs –
Advisory Board – The five members of the Advisory Board will each receive $1,000 honoraria for attending the biannual Board meetings.
5 x $1,000 x 2 meetings = $10,000
Funds to cover meal expenses during meetings = $300

Instructional Resources: Flexible use classroom renovation - $210,000. CSUN will contribute $95,000 in construction and wiring to the project. See next two pages for further details and cost estimates.

Institutional Resources Justification
Currently, the Developmental Mathematics Program has two multi-use classrooms that allow a class to flow from lecture, to groupwork, to online work seamlessly within one room. This is accomplished by having the computers in “hideaway” desks that hide the computers during lecture time and pen-and-pencil groupwork. This eliminates the distraction factor, which is frequently a problem when students attend lectures in a traditional computer lab space. For groupwork, students in the first and third rows swivel around to work with students in the second and forth row. Extra knee space is built into the second and forth rows to allow for a comfortable common workspace. During online work, the computers come up and students can work individually or in groups.

This model has facilitated many of our classroom innovations in the last three years. It enables students in the hybrid lab model to move from supplemental groupwork in the labs to online remediation in one facility. It allowed us to pilot a program for our spring 2012 students repeating Math 092 (our lowest level developmental mathematics course) to allow facilitated individualized instruction. The class started with a mini-lecture followed by an online pre-test, and online study-plans. The next class meeting was all pen-and-paper groupwork. This allows the students to move quickly through the topics that they learned in the fall and focus on their individual trouble spots within each topic. However, it maintains the sense of the group moving forward that is an important component to student success. This pilot would be impossible to run in the traditional computer lab or classroom.

Finally, these facilities are of great use to the University at large. When not utilized as multi-use classrooms, they are completely functional as traditional classrooms or computer labs. They use thin client technology, which allows them to be re-imaged to any purpose with one hour’s notice. Our two rooms are used by multiple departments as well as by the Center for Disabilities for specialized testing and the University Testing Center for placement tests. They are busy six days a week and in and out of term time.

**Lab Cost Estimates Follow-on Funding:**

Follow on Funding:
Hide-away tables for three rooms = $118,017
100 thin client computers = $82,000.
## Lab Cost Estimates for CSUN Match:

<table>
<thead>
<tr>
<th>BH Rooms</th>
<th>Funding Source</th>
<th>Provider</th>
<th>2011–2012</th>
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<td>BH  SMART refresh project – Construction – Joc Project#: 930667-060</td>
<td>Dev. Math</td>
<td>Facilities</td>
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<td>ITR--Ports</td>
<td>Dev. Math</td>
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<td>RDF</td>
<td>Facilities</td>
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<tr>
<td>Subtotal for 3 rooms</td>
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<td>Add Blade fro increased data load</td>
<td>Dev. Math</td>
<td>ITR</td>
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<td><strong>Total for project</strong></td>
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<td></td>
<td><strong>$95,573.43</strong></td>
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</table>
CSUCI January 1, 2012 - June 30, 2012

Total funds requested: $45,841

Personnel and Benefits:

Dr. Ivona Grzegorczyk (Co-PI) will contribute .75 FTE throughout the academic year in spring 2013 and 18 days during periods outside the academic year (winter/summer). Her responsibilities will be collaboration with the university and IT personnel to support the labs.

$117,576 AY 12/13 salary x 2.5% (.75 units course release) = $2,939

$603 x 18 days (winter/summer breaks in 2013) = $10,854

**Total Request: $15,096**

Dr. Roger Roybal, Mathematics Lab-coordinator and CI Lecturer in Mathematics, will contribute .20 FTE to the project. He will be responsible for student hiring and supervision, training of faculty and students in the computer lab, and technology related faculty development. He will teach two lab sections with an undergraduate student assistant. He will help with data collection.

$67,380 AY 12/13 salary x 20% (6 units course release) = $13,476

**Total Request = $13,476**

_Undergraduate Instructional Student Assistants (ISA):_ ISA roles and responsibilities will be to assist faculty and students during lab sessions, and to track student progress. 10 ISAs x $13/hr. x 60 hours/semester each x 1 semester = $ 7,800.

**Fringe benefit rates** – CI’s fringe benefit rate is 44.3% and is applied only to faculty academic year course release time. Total Fringe benefits = $7,272.

**Materials & Supplies** – will include handouts, small technological items (including flash drives) and mathematical manipulatives for the supplementary labs. $2,000.

**Printing/Publications** – funds will be used for distribution of designed curriculum to other collaborators, faculty and students. $1,000.

**Travel & Accommodations** – funds will be used for in-state travel to meetings with university partners and local community college collaborators –Approximately 600 miles x .50 per mile= $300.

**Institutional resources**

Remark: CI has computer labs, 50 iPads and 40 graphing calculators that will be used at various stages of this project.

CI faculty will work with Dr. Grzegorczyk and Dr. Roybal on development, implementation and testing of new course materials in their sections. They will provide best practices and tools for learning and work with other faculty on introduction of new lab-based teaching strategies.
CSULB January 1, 2012 - June 30, 2012

Total funds requested: $172,594

Personnel and Benefits:
Salary is requested for faculty coordinating and teaching the targeted courses to participate in the development and refinement of course materials, and the collection of data indicating the success of the programs. Coordinators will prepare and update recitation materials for all course sections, will develop and implement the “early warning” messages for all students, will collaborate with other Chemistry instructors on ongoing development of assessment materials.

Florence Newberger CSULB Mathematics lead and course coordinator for all Math courses.
$89,976 AY 12/13 salary x 25% (6 units course release) = $22,494

Jen-Mei Chang CSULB chemistry lead who will oversee the three chemistry classes implementations.
$63,276 AY 12/13 salary x 25% (6 units course release) = $15,819

Dr. Chris Brazier - Chemistry Data Analyst.
$78,240 AY 12/13 salary x 8.33% (2 units course release) = $6,520

Dr. Kagba Sauray - Mathematics Data Analyst.
$72,984 AY 12/13 salary x 25% (6 units course release) = $18,246 Double this

Two Graduate Assistants, one in math and one in chemistry, to help input the data and run the statistics.
$9000

Shahab Derakhshan - Chem 111A Course Coordinator
$66,024 AY 12/13 salary x 16.67% (4 units course release) = $11,004

Nancy Gardner - Chem 101 Course Coordinator
$63,048 AY 12/13 salary x 16.67% (4 units course release) = $10,508

Steve Mezyk - Chem 111B Coordinator
$88,296 AY 12/13 salary x 16.67% (4 units course release) = $14,716

Ladera Barbee, Assissting Math projects.
$49,128 AY 12/13 salary x 8.33% (2 units course release) = $3,275

Andrea Chen, Assisting Chem 101 project.
$52,524 AY 12/13 salary x 8.33% (2 units course release) = $4,377

Marian Mohammadi, Assissting Chem 111B project.
$46,039 AY 12/13 salary x 8.33% (2 units course release) = $3,069

Jean Lee-Lin, Assissting Chem 111A project.
$52,386 AY 12/13 salary x 8.33% (2 units course release) = $3,493

Fringe Benefits: CSULB State Employees Fringe benefit rates are 43.7% for faculty reimbursed time (academic year), and 8% for part-time faculty.

Indirect Costs: Indirect Costs (IDC) are capped at 10% on a base of modified total direct costs as stipulated in the grant proposal guidelines.

Cost Share: Cost share exceeding the amount listed on this budget is not implied nor should it be inferred from other statements in the project description, project summary, budget justification or other sections of this proposal.
CSUMB January 1, 2012 - June 30, 2012

Total funds requested: $45,297

Personnel and Benefits:
Dr. Hongde Hu (Co-PI) His responsibilities will be designing, implementing, and directing the Hybrid Model at CSUMB; serving as the main liaison to CSUMB and the partners’ departments, faculty, administrators, and students; and coordinating and conducting the faculty development Institutes.
$89,148 x AY 12/13 salary x 21% (3 units release time plus 5% of summer & winter stipend) = $18,820

Ms. Alysia Walther will coordinate all Faculty development Institutes and collect all data for the evaluator.
$48,228 AY 12/13 salary x 5% (0.5 month) = $2,679

Jonathan Baptista, is the I.T. Specialist/project coordinator for the Wireless Education and Technology Center. His roles and responsibilities will be to assist faculty and students in the use of Tablet PCs, and to maintain the equipment.
$34,486 AY 12/13 salary x 10% = $3,449

Faculty TBD will work with Dr. Hu developing new course materials and the online student response system, work with faculty at local community colleges as they acquire new skill sets, teaching strategies with the Hybrid Model. The methodology for estimating their base salary is the average of all mid and upper level faculty salaries.
$74,000 AY 12/13 salary x 2% x 6 faculty = $7,795

Peer Tutors will serve as peer tutors in classes and labs, track student progress.
$10/hr x 500 hours = $5,000

Fringe benefit rates are negotiated annually with the University Corporation’s cognizant agency (US DHHS). The FY 12/13 benefit rate for faculty summer, faculty additional employment and student assistant is 5.3%.

Institutional resources
CSUMB has Tablet PCs awarded through grants that will be included in the project activities for faculty and students.
HSU January 1, 2012 - June 30, 2012

Total funds requested: $16,661

Personnel and Benefits:
Dr. Borbala (Bori) Mazzag will coordinate MATH 115 pilot sections including common examinations; reviewing and revising lecture notes and discussion workbooks; supervising all undergraduate instructional assistants at HSU; and serving as the main liaison to HSU and the partners’ departments, faculty, administrators, and students.
$ AY 12/13 salary x 20% (3 units overload pay) = $6,248

Michael Stobb is project data analysis expert and will be paid hourly. His roles and responsibilities will be to assist with data collection; database construction and maintenance; and statistical analysis.
$17.26/hr x 100 hours = $1,726

Peer Tutors will serve as peer tutors in classes and labs, track student progress.
$11.67/hr x 540 hours = $6,300

Fringe benefit rates: Student fringe rate is dependent on whether the work is performed during the academic year or during the summer. It is expected that 25% of the Graduate Student Assistant’s time will be during the summer with the remaining during the academic year. All other student time will be allocated to the academic year. The total cost for student fringe benefits will be $555. The total cost for Dr. Mazzag will be $1,832 for a total fringe cost of $2,387.

LAPC January 1, 2012 - June 30, 2012

Total $52,056

Personnel and Benefits: All faculty will be paid the standard LAPC hourly rate of $92/hr and all students will be paid the standard LAPC hourly rate of $15.46/hr.

Coordinator in Spring 2013:
1 unit for spring = 20 hours = $1,840

Adjunct
6 units for fall and 14 for spring = 20 x 20 hours = $36,800

Tutors: Their roles and responsibilities will be to serve as peer tutors in classes and labs, track student progress.
300 hours x $15.46 approx. $4,638

Fringe benefit rates: The fringe benefit rate for faculty is 22.05% and for tutors is 5.45%
F. LETTER OF SUPPORT

August 30, 2012

MEMORANDUM

TO: Executive Committee of Next Generation Learning Challenges (NGLC)
FROM: Ephraim P. Smith, Executive Vice Chancellor and Chief Academic Officer
SUBJECT: Hybrid Labs for Core General Education Courses

The California State University (CSU) is pleased to support California State University Northridge’s (CSUN’s) proposal for NGLC funding. The project will expand the application of an innovative technology-enhanced hybrid course model to improve student completion and content mastery in general education math courses.

The CSU system enrolls over 400,000 students at the bachelors and masters level and our mission is to provide high-quality, affordable, postsecondary education to all qualified Californians. When innovations designed to improve student success are deemed effective through rigorous evaluation, we attempt to scale them across the 23 campus system. The funding for all systemwide initiatives has diminished due to very deep budget cuts to higher education in California, but we do what we can to improve student success with our available resources.

With this renewal application, CSU Northridge proposes to refine and scale up its successful and cost-effective hybrid mathematics course by continuing its collaborative partnership with CSU Long Beach, Humboldt State University, and Los Angeles Pierce College. The renewal application proposes scaling the model by including CSU Channel Islands and CSU Monterey Bay in 2012-2013. We are pleased that CSU Monterey Bay has started the process through a COMPASS grant from the Chancellor’s Office. The funding decision was based, in part, on the project’s similarity to the Hybrid Math Model pioneered by the CSUN consortium.
The CSU Chancellor’s Office believes that propagating the hybrid model to other CSU campuses will help to solve a chronic problem with multi-section, gateway, and bottleneck courses with high failures. To stimulate the use of the model, the system office will:

1. Promote the expansion of the hybrid model in business math classes across the CSU by presenting it to a meeting at the council of business deans.

2. Begin advocacy and recruitment with presentations at meetings of the presidents and provosts.

3. Use the hybrid model as an example of “best practice” when addressing the growing state concern over cost of instruction and student graduation rates.

4. Encourage the use of the hybrid model by campuses as a method to improve student success.

We are impressed with the model as it combines engaging in-class interactive lectures, group work in supplemental instruction, and “just-in-time” remediation of prerequisites, all within the framework of a parent course coupled with a 1-unit hybrid lab. Having common lecture notes, practice exams, and online homework assignments with instant grading and feedback capabilities has demonstrated success. The hybrid lab’s group work and individualized online remediation for each student provides for active student engagement as well as customized tutorials. We hope the Phase II consortium will continue with new course material development as well as the creation of new training modules and assessment tools.

We know that many other CSU campuses will be interested in the work of CSU Northridge and their partners. The model builds flexibility and support into general education curriculum and devises ways to deepen student learning. These are all promising directions of change, and deserve our support. We urge you to support the grant application, which has the system’s wholehearted endorsement.

ES/mhn

cc: Dr. Ron Vogel, Associate Vice Chancellor, Academic Affairs
    Dr. Marsha Hirano-Nakanishi, Assistant Vice Chancellor, Academic Affairs
    Mr. Ken O’Donnell, Senior Director, Student Engagement and Academic Initiatives and Partnerships