Quant Lab: A Hybrid Active Learning/Adaptive Computer Co-Requisite Class for Developmental Math

Overview

Need for remediation in math and English at the college-level is a costly and widespread problem in the United States. It has been estimated that nationally the cost of remedial education is over 1 billion dollars per year (Saxton & Boylan, 2001). This is a particular problem within California public colleges and universities. Students who require remediation at matriculation are far less likely to earn their degree. If they do remain enrolled, those students on average take longer to complete their degree than those without the need for remediation.

The Department of Mathematics and the Office of Undergraduate Studies at CSUSB request $150,000 to develop and test a lab course, Quant Lab, that will provide co-requisite support to students needing remediation to succeed in General Education math courses. The new course will be piloted during the 2017-2018 academic year (AY) and within the summer 2018 Coyote First STEP (CFS) summer program for underprepared first year students. This work will enable CSUSB to comply with the new executive order from the Chancellor's Office (EO 1110) requiring changes in how developmental courses are offered and paid for by Fall 2018. The work described here is one part of a larger curricular and pedagogical transformation that the Department of Mathematics is undertaking in preparation for the university's conversion from a quarter to a semester academic calendar.

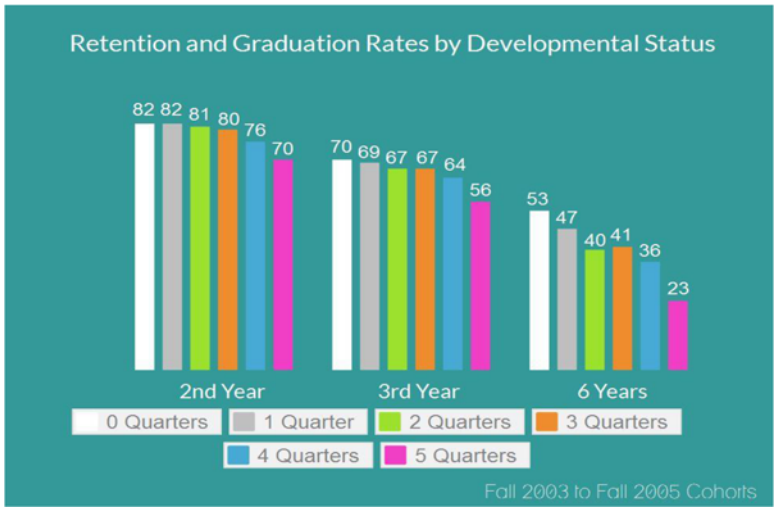
This project is primarily designed to address the GIA goal of increasing baccalaureate attainment. The project contributes to this goal by piloting an innovative developmental math pedagogical model that will more effectively and efficiently help students with the most significant deficits in mathematics achievement/preparedness demonstrate mastery/preparedness for college-level math following participation in our signature summer orientation/remediation program Coyote First STEP. [Note: *Throughout this proposal the terms remedial education and developmental education are used interchangeably*.]

Organizational Background & Capacity

California State University, San Bernardino is a public, comprehensive four-year institution of higher education. Since its inception in 1965, CSUSB has grown to an enrollment of more than 20,000 students. CSUSB now has the most diverse student population of any university in the Inland Empire. As of Fall 2016, CSUSB has a student population of 20,767 (FTES 18,070). Females comprise the majority of our student body (61%). Eighty-one percent of students are first-generation college students; 60% are Hispanic, 14% are White, 7% are non-resident foreign students, 6% are African American, and 6% are Asian. Sixty-three percent of our undergraduates are low-income students (Pell Grant recipients). Our four-year graduation rate is 12% and six-year graduation rate is 55%. At admission, 68% of first time first year students required some form of developmental coursework in Math and/or English: 30% needed both Math and English, 31% needed Math only, and 7% needed English only.

Our students (86%) come from San Bernardino and Riverside counties and attended public schools that have some of the lowest academic performance scores in the state. For example, only 7% of the high school students in both Counties who take the math early placement test receive a score indicating 'college-prepared' (Riverside County Office of Education, 2016).

There is a very strong relationship between need for remediation and academic success as measured by retention and graduation rates. Thus, if CSUSB is able to create solutions that reduce or eliminate the need for remediation, we can improve the academic acheivement of the majority of our students. As such, the GIA goals of reduction in remediation and increases in baccalaurete attainment are addressed.



To address the extensive need for developmental math, CSUSB created an innovative and very effective summer program for first time first year students in 2014. Coyote First STEP (CFS) is a comprehensive program of both academic and co-curricular experiences that is designed to reduce the need for remediation at enrollment and to provide the necessary socialization and psychosocial support structures proven to help Hispanic and other high-need students succeed in their post-secondary education. CFS has demonstrated significant, positive results in reduction of need for remediation (more than 90% of participants progress at least one level in math), and important psychological impacts linked to long-term academic success including sense of connectedness, etc. (See comprehensive research reports here: https://www.csusb.edu/institutional-research/institutional-effectiveness). Nonetheless, the evidence to date indicates that we continue to have approximately 35% of students who have participated in CFS require one or more developmental math courses upon Fall enrollment. We believe that by implementing new pedagogical techniques and technologies and revamping the curricular model CSUSB will achieve a significant reduction in the remediation needs of future CFS students and reduce the amount of time it takes for all to reach GE college math.

CSUSB is also preparing for conversion of the academic calendar from quarters to semesters (Q2S). This is a behemoth undertaking as it involves nearly every aspect or function of the university. This has also presented our university with the unique opportunity to make significant curricular transformation in both General Education and in major fields, as the faculty work to convert their curriculum to the new calendar. The Math Department is beginning work on transforming and updating curriculum and pedagogy through the adoption of evidence based practices and technology. The confluence of all of these factors—need for additional remedial math following CFS, new state-level mandates about developmental courses, and math curricular transformation for Q2S—is the 'perfect storm' propelling the proposed work.

Proposed Activities

CSUSB proposes to (1) develop an innovative, flexible system for developmental support for GE math in a co-requisite model, (2) provide additional technological and human supports through tutoring, supplemental instruction, etc., and (3) engage adjunct faculty and graduate teaching assistants in focused professional development to master new pedagogy and curriculum. Through these efforts we will significantly improve student outcomes, particularly for those who have remedial math needs, by accelerating students' enrollment in credit-bearing math courses through co-requisite remediation. The components of this initiative are all based upon evidence-based practices.

Curricular & Pedagogical Innovation. At the state and local levels much has been done to address the need for English remediation. At CSUSB, we have implemented an innovative, and highly effective model whereby students requiring English remediation are integrated into the college-level courses. We refer to this as directed self-

placement, and it is a co-requisite model for remedial English education (Complete College America, 2012). Those with the greatest deficits are required to participate in supplemental instruction/tutoring. Here, we propose a similar model for math that we believe will result in improved outcomes during CFS and the academic year for those that still require one or more developmental courses upon enrollment.

In order to comply with EO 1110, all of our developmental courses will become co-requisites, not prerequisites. We will implement the Quant Lab as one of our co-requisite models for instruction. (The Department of Mathematics will also offer "stretch" versions of GE courses, as the English department does for composition courses.) Recent research (Chen, 2016) suggests that requiring remedial work before students are allowed to take a college level course discourages many students, causing them to drop out. Co-requisite classes (taken during the same term as a general education course) have been shown in some studies to get students through GE math courses in less total course time than when taken sequentially. Though EO 1110 does not require any specific course content or pedagogy, we hope to take advantage of recent research (Freeman et al., 2014a) that strongly supports active learning, in addition to new curriculum that focuses on the fundamental ideas that may be missing from students' experience, such as understanding the meaning of variables and functions, and broad understanding of proportional reasoning (Carlson, Oehrtman, & Moore, 2016; Resek & Kysh, 2012).

The summer Coyote First STEP has already shown success in cutting the number of prerequisite courses students must take before their General Education (GE) required math courses. However, the curriculum used so far has focused on sharpening students' algebra skills. We are revamping all of our GE courses to address the campus's new GE Learning Outcomes, as mandated by our accrediting board, WASC. These Learning Outcomes focus only incidentally on skills; they aim to move students to higher conceptual levels by the time they graduate. The first-year GE courses must give students significant experience in critical thinking, problem solving, and applications, and developmental work must prepare students for that.

Since the founding of CSUSB in 1965, the Math Department has had a fairly traditional approach to teaching. Many of the faculty are most comfortable with lecturing. Textbooks for GE and developmental math have focused on skills, taking the point of view that higher order thinking skills will develop later. But the confluence of a number of mandates, new technologies, and educational research has given us the impetus to change everything: curriculum, teaching styles, the way developmental math is handled, and explicit professional development. One valuable new development is close communication between Math and the Office of Undergraduate Studies (UGS), who handle co-curricular services that include tutoring and Supplemental Instruction. We intend to leverage our budgets and personnel to run a sustainable Quantitative Reasoning ("Quant") Lab that efficiently helps students through their first-year math courses. Once the lab is established, it may also assist students in other quantitative courses, such as disciplinary statistics courses, and math for elementary teachers.

The lab will use a hybrid of two proven educational strategies: Active Learning (Freeman et al., 2014b) and Mastery Learning (Bloom, 1971; Guskey, 2010). Active learning is appropriate for developing the higher-order thinking skills needed for college level work. Trained instructors will facilitate group problem-solving sessions, helping students develop not just their mathematical skills, but also working on creative problem solving, flexible ways of thinking about mathematical topics, working effectively with others, and communication skills. Mastery Learning stems from the work of Benjamin S. Bloom (1971). His interest was how teachers could adapt the most effective teaching behaviors with tutoring and individualized instruction to improve student learning. He, like other scholars, recognized that although students vary widely in their range of ability and rates of learning, when teachers can provide the necessary time and effective teaching behaviors, students will reach higher levels of achievement. When he originally experimented with this method, the burden of planning and carrying out this complex pedagogy was on the teacher. Now we have effective adaptive software for math skills. Two examples are ALEKS (commercial software) and WebWork Just in Time problems (free, open source). Programs like this can efficiently handle the cycle of formative assessment and re-teaching.

Chen (2016) quotes (Boatman and Long, 2010), who "found that remedial course-taking benefited students with weaker skills but provided little help to those at the margin of needing remediation, suggesting that the impact of remediation differs according to students' level of preparation." Adaptive computer assessment offers the possibility of streamlined, customized placement and remediation, with students working on the areas they need. Instead of all students being required to pass an algebra course needed for a calculus class they may never take, this new more individualized instruction will help students be prepared for their chosen GE path—perhaps statistics or mathematical

modeling.

Co-curricular Supports. *Supplemental Instruction (SI)* is a research based peer-led academic support program designed to target "high-risk" or historically difficult college courses by providing peer-led, subject-matter discussion instruction, support, and guidance to strengthen critical college skills. There is a wide range of literature on the efficacy of SI. The US Department of Education has validated and recognized SI as a program that increases student graduation rates. One underlying principle of the SI model is that student peers and not professors directly interact with the students, to build a sense of community and peer interaction. A recent study of the SI program at CSUSB used matched sample analysis of SI versus non-SI participants and results suggests that SI participants consistently performed better than their non-SI peers enrolled in the same courses (CSUSB Institutional Research, 2017). SI sessions are facilitated by student peers (SI Leaders) who have demonstrated academic success in comparable coursework and are trained on designing and conducting SI sessions, small group learning dynamics, general and discipline-specific learning strategies, effective test taking skills, etc. Typically, SI Leaders attend course lectures and facilitate two, fifty-minute small group SI sessions per week for students in the respective course. In support of the co-requisite model for students enrolled in mathematics 90/110, two SI Leaders will be embedded in each GE course with the expectation that they will facilitate in-class small group mini SI sessions that will accompany and support the active learning strategies employed by math faculty.

Tutoring. There are many benefits to tutoring, which would support the innovative curriculum being developed by the math department. Tutoring improves work and study habits, which in turn increases confidence and attitude to handle class assignments effectively. More importantly, tutoring also improves social and behavioral skills because of the need for interaction between the tutor and the student. Such aspects of tutoring should function seamlessly and efficiently with the learning models being developed by the math department.

Faculty Professional Development. Drawing on Kezar's (2013) theory of institutional change and Wenger's (2000) community of practice model for learning, a coherent, holistic set of professional development opportunities will be developed and implemented to involve faculty in redesigning the developmental and GE math courses, and enhancing their instruction. CSUSB administrators are committed to achieving the student success goals outlined in the CSU system's Graduation Initiative 2025 (GI 2025); the faculty are currently being required to rethink all of their curricula and courses as part of the campus' conversion from quarters to semesters (Q2S).

Research reports that active learning benefits minority students disproportionately (e.g., Haak, HilleRisLambers, Pitre, & Freeman, 2011). Traditionally, developmental classes have used the most regressive pedagogy with the least experienced instructors. Our focused professional development for instructors will not only address mathematical pedagogy, but also discuss the non-curricular issues in our students' lives so that we can help them become mature students. Our program aims to create a cadre of expert practitioners. We fear that these lecturers and TAs will move on to permanent positions at community colleges, but that would be an excellent result for our region.

Until summer 2017, we offered developmental math adjunct faculty no opportunities to be part of a community of teacher/learners. This past summer we ran the first annual TRC/Math summer institute. Over half of the math adjunct faculty participated, as well as most of the teaching associates. Four tenured/tenure track faculty members ran the institute. In summer 2018 and 2019 we will again convene CSUSB adjunct faculty and graduate teaching associates who are responsible for teaching the developmental and GE math courses within the academic year and in CFS. If funding permits, will also invite tenured/tenure track faculty, as well as participants from our partner institutions: local community colleges, UC Riverside, and Cal Poly Pomona.

The initial focus of the institute will be on collaboratively learning about the new curricular co-requisite model, experimenting with the new curricula, and teaching technologies, as well as aspects of social-emotional learning that support mathematics learning. Participants will gather periodically through the academic year in groups organized around courses: college algebra, pre-calculus and calculus, statistics and Ideas of Math.

Partnerships

CSUSB has signed Memoranda of Understanding (MOU) with 20 feeder high school districts, guaranteeing

admission to CSUSB for students from those districts who satisfy the college preparatory curriculum. Creating these MOUs is one example of how CSUSB is collaborating with other stakeholders across the Inland Empire to improve educational outcomes and access for the region.

We are also beginning to build relationships with other local colleges. We are in conversation with the coordinator of the pre-calculus program at U.C. Riverside (Dr. Sara Lapan) and the coordinator of developmental math transformation at Cal Poly Pomona (Dr. Stacy Musgrave). Many of our adjunct faculty members also work at community colleges, including Victor Valley College, San Bernardino Valley College, Riverside Community College, and Chaffey College. By sharing professional development projects with them, we extend the effectiveness of our work to the institutions that supply a majority of our transfer students. We plan to invite them to our second and third annual TRC/Math Institutes in the summers of 2018 and 2019. Several already participated in the first institute in summer 2017 as CSUSB adjunct faculty. Throughout this project and at its culmination we will collaborate our regional partners to support their adoption of the best practices for developmental math curriculum and pedagogy that emerge from this project.

Program Evaluation

CSUSB has a strong value for data-driven decision making and organizational learning through on-going review and assessment. These values are prominent in our institutional strategic plan, and evaluation and continuous learning processes are planned within all our initiatives. The Office of Institutional Research & Institutional Effectiveness have developed rigorous assessment techniques to monitor student progress and impact of interventions, such as CFS, on multiple factors. Similarly, as a federally funded program CFS and our larger developmental math program have a nationally recognized external evaluator conducting longitudinal research on the efficacy of that project. We will utilize the internal and external expertise to carefully monitor the affects of this project, both on short-term (formative) outcomes and long-term (summative) outcomes beyond the life of this grant.

The evaluation will be designed as a mixed methods study in which a combination of both qualitative (e.g., focus groups, interviews) and quantitative indicators (e.g., student surveys, student institutional data) will be used to answer key evaluation questions. The evaluation will track all program data on a regular basis to ensure program activities are implemented as planned and with high quality, while assessing the impact of these activities on faculty, students, and the institution. We will compare past rates of key academic outcomes including remedial course completion, retention, and graduation rates. Short- and medium-term outcomes (e.g. increased sense of belonging, GE math pass rates) will be assessed using student surveys, program documents, institutional research data, and site observations. Ultimately, changes in short- and medium-term outcomes are expected to lead to the long-term outcomes of eliminating achievement gap in 1) time-to-degree, and 2) year-to-year retention for students who test below college-level in math compared to non-remedial students.

Specifically, the formative evaluation will examine the students' progress through required college-level courses, their course choices and majors, and other relevant academic indicators. We will seek to answer such questions as: Do more students succeed in STEM courses and majors? Do students pass other quantitative classes at higher rates (such as disciplinary statistics courses)? We will also be able to collect micro-level data on progress through the course through the instructional software we will implement. We will also give surveys to students about beliefs and attitudes towards math and their developing learning habits.

Summative evaluation will primarily focus on the longitudinal goal of having more students complete degrees in less time, and with greater quantitative reasoning skills. So the data we collect must include not only successful completion of the Quant Lab course, but also a longitudinal study to discover which students complete a degree, in what fields, and over what amount of time. Our Institutional Research office has the software and expertise to help us to do this. We plan to continue tracking such outcomes for at least 5 years beyond the grant period.

Dissemination of Findings. Sharing what we learn from this project is critical to achieving the regional goals of the GIA. Through the partnerships and collaborative activities described herein, as well as through the GIA leadership, findings and best practices will be shared regularly throughout the project. This is keeping with our shared value for on-going learning and continuous improvement of the educational initiatives we launch. We believe the new curricular and pedagogical techniques will serve as a model of developmental math.

Project Management

Project Director. Dr. Susan Addington is Professor of Mathematics at CSUSB, and has taught there since 1988. She is coordinating the redesign of the department's GE and developmental programs, in conjunction with committees of other faculty. Before embarking on this project, she focused on math for elementary teachers and became an expert on mathematical cognition, especially proportional reasoning.

Project Co-Director. Dr. Terry Rizzo is Professor of Kinesiology & Project Director for the Title V funded Coyote First STEP program. Terry has extensive experience with project design and management, and administrative leadership within CSUSB. He will be a vital partner in ensuring implementation and coordination run smoothly and in leveraging internal and external resources to support the project.

Developmental Math Experts. Dr. Lynn Scow has been an Assistant Professor of Mathematics at CSUSB since 2016. Previously, she worked in Active Learning at Vassar College. Dr. Scow has been instrumental in rethinking developmental math in the department. She will work closely with Dr. Addington on the curricular and pedagogical innovation and implementation, and with delivery of professional development.

Joyce Ahlgren has been a full-time Lecturer in Mathematics since 2003. She has single-handedly run the developmental math program and is also a key member of the committee for the Math for Elementary Teachers sequence. In 2013 she was the inaugural Outstanding Lecturer at CSUSB.

Co-Curricular Support Service Experts. Under the leadership and advisement of Qiana Wallace, Assistant Dean of the Office of Undergraduate Studies various services such as supplemental instruction and focused tutorial series will be coordinated and offered. Staff members who will support and lead those efforts include: David Reyes, Tutorial Program Coordinator, and James Graham, Coordinator of Supplemental Instruction.

Professional Development Experts. The Teaching Resource Center, under the leadership of Dr. Davida Fischman will be integral to the development and delivery of high quality professional development, as described herein. The TRC team will support the Project Director and project team members in recruiting and organizing the seminars and other PD opportunities for curricular and pedagogical innovation.

Additional support and coordination will occur across other divisions and areas, particularly within the Division of Student Affairs, Academic Affairs, and Information Technology Services. Dr. Alysson Satterlund, Associate Vice President for Student Affairs & Dean of Students will be a crucial project advisor providing high-level coordination and administrative support. She is also the Project Co-Director for Coyote First STEP.

Timeline

During AY 2017-8 we will work on some pilot projects to discover how to leverage the resources we will have after the end of this grant to help students succeed in their GE math courses. During CFS in summer 2018, we will experiment with different combinations of instructor-led sessions and individual adaptive computer work. Instructors will be experienced TAs who have taught with the new curriculum (Resek & Kysh, 2012) for developmental math courses during this transitional year before the implementation of EO 1110. Other tutors and student assistants will be on hand for help during the computer segments. In AY 2018-9 and summer 2019, EO 1110 will be in effect, so most work will be credit-bearing. We will change the system as needed.

Late fall 2017, winter and spring 2018

- Meet weekly to plan for implementation of QuantLab in academic year courses and Coyote First Step.
- Addington and Ahlgren will be running a teaching practicum seminar for graduate teaching assistants.
- The developmental courses Math 80 (Fundamental Algebra) and Math 90 (Intermediate Algebra) will be using new active learning curriculum and pedagogy
- Gather and analyze baseline data from Institutional Research
- Thoroughly explore software packages: ALEKS, WebWork, etc.

- Confer with colleagues at other CSUs concerning developmental math curriculum
- Deliver one class of Math 90 in Spring 2018 as a Quant Lab.

Summer 2018

- Run a training program before CFS begins for instructors who will be running the Quant Lab
- Run the summer institute (3 days in midsummer)
- First CFS session: Implement the Quant Lab in some sections of CFS, with the other sections as a control: possibly some with only class work and homework and no computer supplements, some with only computer work.
- Second and third CFS sessions: adapt the plan if necessary and if possible.
- Continue to collect and analyze data

Fall 2018, Winter and Spring 2019

- The developmental courses Math 80 (Fundamental Algebra) and Math 90 (Intermediate Algebra) will be using new active learning curriculum and pedagogy
- Implement a co-requisite Quant Lab that coordinates with at least one GE math course; adapt the Math 80 and 90 materials for a co-requisite course instead of a prerequisite course (as in AY 2017-8)
- Analyze the data from AY 2017-8 and summer 2018
- Continue the TA teaching practicum, adapted for the new instructional program
- Adapt the CFS program as indicated by findings from summer 2018

Summer 2019

- Run instructor training, summer institute, CFS, incorporating changes based on analysis of previous year

Early fall 2019

- Prepare final report

Budget Narrative

CSUSB requests $150,000 over the two-year project period. A detailed line-item budget with a breakdown of requested and matching funds is provided in Appendix A. The true cost of the work proposed is substantially higher than the grant award amount. The requested funds will leverage substantial investment that has been made, and will continue to be made not only in CFS, but also in the institutional change effort undertaken to convert from quarters to semesters. The sources of funding that will be leveraged include but are not limited to the following: US Department of Education Title V award, CSUSB operational budget, K-12 partner institutions partial support for their CFS students, Chancellor's Office investment in CFS and in academic calendar conversion, Student Success Initiative funds, CSUSB's internal Vital Technology grant program (for learning technologies), operational budgets for the various divisions providing support services (e.g., Math Department, TRC, Student Affairs, Undergraduate Studies), and other institutional and external resources as needed. Additionally, CSUSB will provide the necessary post-award fiscal management for this project as in-kind contribution (on average, that cost is 10% of cumulative project costs). Our leaders will work to leverage additional internal and external resources as necessary to ensure the success of this critical institutional project.

The proposed work is part of a larger institutional transformation as we prepare for the new semester calendar. The 'go live' date for the new academic schedule is Fall 2020. This award will enable our project team to move more quickly with piloting and refining new curriculum, and providing professional development to CSUSB and partner faculty members to adopt newer pedagogical techniques and integrate learning technologies described herein. The changes to be made and necessary due to the educational challenges our students face, and the state-level mandates. The initiative described is fundamental organizational change, and will be institutionalized via the new adopted co-requisite model. Below is a brief summary of our project budget.

Key Personnel. Funds will be used to provide Academic Year and Summer effort for the Project Director and the two Developmental Math Experts. A portion of the effort will be covered with GIA funds and a portion will be provided through internal matching sources (departmental budgets, Q2S, etc.). The average cost of adjunct replacement faculty members when a tenured faculty takes course release is $5000. Summer salary is calculated at their full salaried rate of pay.

Other Personnel. Matching funds will be provide through the CFS grant and operational budget to provide support for graduate TA/Supplemental Instructors, and additional adjunct faculty to deliver the new Quant Lab course during CFS.

Fringe Benefits. The associated fringe benefits for personnel will be provided via the sources that fund that effort. The calculations/rates are detailed in Appendix A.

Supplies. A combination of matching funds and requested GIA funds will be used to acquire necessary instructional supplies. Specifically, modest funds are requested for disposable office supplies; software costs/licensing for the necessary learning technology will be covered with a combination of GIA and matching funds (e.g., SSI funding); learning materials for faculty who participate in the professional development seminars is estimated at $1500 and will be paid through GIA funding. To optimize the impact of the new course it is critical to retrofit classrooms for more flexible use of space and engagement in active learning. The ITS Division is responsible for such re-design and technology infrastructure installation. They have estimated the cost at $27,000 per classroom, and we anticipate those costs will be covered through matching funds (e.g., Vital Technology grant, CNS funds for infrastructure upgrades, etc.)

Professional Development Participant Support. Funds to provide stipends for three facilitators will be provided through internal matching funds. GIA funds are requested to provide participation stipends to the graduate TAs and to the invited adjunct and other faculty who will implement the new course curriculum and pedagogy.

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Appendix A: Project Budget

QuantLab Pilot

	Year 1		Year 2	
Personnel	GIA	Match	GIA	Match
Salary				
AY 2 course release & 1 summer month				
Addington	$ 16,304	$ 5,000	$ 16,304	$ 5,000
Scow	$ 12,000	$ 5,000	$ 12,000	$ 5,000
Ahlgren	$ 12,593	$ 5,000	$ 12,593	$ 5,000
Graduate TA/SI		$ 5,000		$ 5,000
Adjunct		$ 10,000		$ 10,000
Total Salary	$ 40,897	$ 30,000	$ 40,897	$ 30,000
Fringe				
Faculty sum/replacment (15%)	$ 6,135	$ 2,250	$ 6,135	$ 2,250
Grad students (12%)	$ -	$ 600	$ -	$ 600
Adjunct (15%)	$ -	$ 1,500	$ -	$ 1,500
Total Fringe	$ 6,135	$ 4,350	$ 6,135	$ 4,350
Total Personnel	**$ 47,032**	**$ 34,350**	**$ 47,032**	**$ 34,350**
Supplies				
Misc. office supplies	$ 468		$ 468	
Software	$ 5,000	$ 4,650	$ 5,000	$ 4,650
PLC/TRC learning materials	$ 1,500		$ 1,500	
Active-Learning room furnishing (2)		$ 27,000		$ 27,000
Total Supplies	**$ 6,968**	**$ 31,650**	**$ 6,968**	**$ 31,650**
Participant Support (summer institute)				
Faciltators (3 X $3000)		$ 9,000		$ 9,000
Grad TA	$ 6,000		$ 6,000	
Adjunct	$ 15,000		$ 15,000	
Total Participant Support	**$ 21,000**	**$ 9,000**	**$ 21,000**	**$ 9,000**
Total Costs	**$ 75,000**	**$ 75,000**	**$ 75,000**	**$ 75,000**