

SBCTC Online Grant Management System

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Applicant Information

Institution: Lower Columbia College
Consortium: No

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Contents

Section 1

Team Lead's Department

Dawn Draus, Mathematics Faculty, ddraus@lcc.ctc.edu

Core Team and Partners

1A. List other faculty/staff (including titles, departments, and email addresses) at the college who will be directly involved in leading and/or implementing the project.

Brad Benjamin, Faculty, bbenjamin@lcc.ctc.edu

Bryn Byker, Adjunct Faculty, bbyker@lcc.ctc.edu

Jeff Lucas, Mathematics Faculty and Department Chair, jlucas@lcc.ctc.edu

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Sue Jackson, Adjunct ABE Faculty, sjackson@lcc.ctc.edu

1B. Indicate which, if any, other departments or offices at the college or other schools or institutions that will play supportive roles in implementing the proposal. (optional)

Carol Flakus, Faculty, cflakus@lcc.ctc.edu

Rick Swee, Faculty, rswee@lcc.ctc.edu

Cary Rhode, Faculty, crhode@lcc.ctc.edu

Adjunct faculty in ABE and Math

Learning Commons staff and tutors

Financial Aid, Registrar, Advising, and Student Services staff

Section 2

Existing Resources/Capacity

2A. Describe the current program structure/format of your pre-college to college-level math offerings including number of full- and part-time faculty who teach courses in the program.

(max. characters: 2,000)

Math courses are currently offered through ABE or through the Math Department. ABE is taught solely by adjunct faculty and is currently an entity separate from the Math Department. The Math Department offers pre-college courses in the Learning Commons, the Math Lab, and the classroom.

The four lowest level courses (whole numbers through percents) are offered in the Learning Commons as self-paced modules with a full-time non-math faculty member serving as the instructor of record. The more traditional pre-college sequence consists of four courses (fundamentals, pre-, elementary, and intermediate algebra). Students have the option of taking these courses in either a self-paced format or in the classroom. Tutors provide assistance in the Learning Commons.

The current Math Lab is staffed by a full-time instructor and tutor. Due to limited hours of operation, the instructor spends the majority of their time reviewing exams, leaving the students to learn the material independently. While the Math Department consists of 8 full-time faculty (2 are retiring at the end of the year and plans to replace them are budget dependent), the pre-college courses are predominantly taught by our 8 adjuncts who are generally not included in discussions regarding goals, curriculum, and teaching practices. Another major concern is that our current approach to curriculum relies too heavily on the "spiral method" resulting in (1) students being lulled into the false belief that none of the information is new and thus they do not adequately prepare themselves for future chapters and (2) valuable class time is lost to covering previous content and hence new topics are not always given the focus required for deep understanding. These issues leave students with only a superficial knowledge of any one topic. Therefore, the pre-college curriculum is not very effective in preparing them for college level expectations of deeper understanding.

2B. Summarize any local research findings you've reviewed on student success in the pre-college math sequence (from Adult Basic Education through developmental education) and in college-level math courses.

(max. characters: 2,000)

Success (achievement of a C or better) rates for the 2008-09 academic year were as follows:
62% for classroom math fundamentals (49% in the lab),
73% for classroom pre-algebra (55% for lab),
60% for classroom elementary (55% for lab), and

63% for intermediate in the classroom (58% in the lab).

Therefore, if a student places into math fundamentals and takes their entire sequence of pre-college coursework through the math lab, they have an 8.6% chance of successfully completing intermediate algebra in four quarters. Unfortunately, the math lab number is not much lower than the 17% probability of successfully completing the entire pre-college math sequence in the classroom.

Part of the problem is that students are generally unable to see the relevance of the content covered in their pre-college mathematics coursework. This is due to the fact that the traditional pre-college sequence is leading to the traditional pre-calculus sequence which is in turn leading to higher level mathematics. The vast majority of our students are not calculus bound and will therefore never see the culmination of the knowledge obtained at the lower levels.

2C. Describe any current or recent projects, grants, campus initiatives, etc. that serve as a foundation for the work being proposed; what existing work are you building on in this proposal and how is it connected?

(max. characters: 2,000)

The Learning Commons is an LCC innovation to make learning a collaborative activity involving students, instructors, tutors, and other resource experts such as library staff. It has proven to be very successful in student and faculty participation. Instructors in several disciplines hold some portion of their office hours in the Learning Commons. This provides student/instructor interaction outside of the classroom and in a more informal setting. Groups of students can help one another as well as work with instructors on course material. We wish to leverage the success of the Learning Commons (LC) with our proposed Math Center (MC). In the MC, all pre-college math students would have access to instructors, technology, and other resources not currently provided in the LC. The vision is of a learning environment that embraces individual learning styles and paces, values student-to-student teaching/learning, and facilitates increased student/instructor interaction throughout the learning process. We believe our Math Center would provide a complementary service to our Learning Commons. Through the Transitions Math Project, LCC has developed a transfer agreement between local high schools and the college allowing certain students to automatically place into college level math courses without having to take a placement test.

In Fall 2008, LCC received an ECED Math and Science Grant from the SBCTC. Early childhood education majors enrolled in the pre-college math sequence are provided with additional instruction which promotes understanding of material in the context of their major and works to improve personal attitudes regarding math. Success rates are noticeably higher for this cohort of students.

Through IBEST, we are able to create student cohorts within their own major in the pre-college math sequence. We are able to provide contextualized content that is immediately accessible to professional-technical students.

2D. What professional development opportunities currently exist for pre-college math faculty (part-time as well as full-time)?**(max. characters: 1,000)**

Both full- and part-time faculty are supported by Faculty Professional Development funds available in \$1100 allotments every two years. The amounts and procedures are contractually agreed upon with the faculty Association. On average, about 30 faculty apply for these funds each year. However, adjunct faculty are generally unaware of this opportunity and rarely apply.

LCC also sponsors three full-time faculty development days each year. Other informal trainings and workshops occur throughout the year, and range in topics from academic honesty to developing online courses.

2E. Based on the evidence you have, what are the current strengths of the pre-college math program and what are the major issues/challenges that need to be addressed?**(max. characters: 2,000)****Strengths**

- * LCC has reached a critical mass of highly motivated and dedicated faculty and administration committed to improving student achievement and success.
- * We have the support necessary to institute broad changes in how we educate the growing population of under-prepared students.
- * We are excited to re-write the curriculum for pre-college to better reflect the needs of students.
- * In fall 2009, LCC served approximately 800 ABE-math students and about 1200 students in developmental math courses.
- * LCC has a strong grounding in evidence-based decision making; institutional research, assessment, and planning are integral to our curriculum and program review.

Issues to be Addressed

- * As currently structured, the math curriculum is not especially effective at moving students through to college-level outcomes; rates of student success are noted in section 2B, and we aim much higher.
- * We recognize the need to allow students to move through the curriculum at a pace determined by their individual needs.
- * The proposed changes will require a paradigm shift away from a dated curriculum driven by no longer applicable conditions.
- * We want to develop curricula that will engage our students in mathematics while simultaneously providing opportunities to gain mastery in college-survival skills, and to instill the culture of learning in the context of math. Our aim is to develop pedagogies that contextualize study skills, are learner-centered, and are case- and problem-based.

* For positive and lasting changes to occur, we need to overcome the negative perception of mathematics instruction on our campus and in our community. We must educate our advising staff to help give math good public relations, and to encourage students to take math early on in their college career.

* We need to ensure that ABE and non-ABE students can seamlessly integrate in the same instructional place.

Section 3

Goals/Strategies/Activities

3A. The overall long-term goal of the project is to increase student achievement in college-level math courses by improving student success in and progress through their pre-college math (ABE and Dev Ed) experience in Washington community and technical colleges. To achieve this goal participating colleges are asked to address core areas of educational practice: what math is taught (restructuring/redefining the curriculum), how it is taught (emphasizing student understanding and engagement), and how it is assessed (refining diagnostic and classroom-based assessments). Given these parameters and the description of your program's strengths and challenges in section 2, describe what you'd like to accomplish if your institution were selected to participate in this project.

(max. characters: 4,000)

First, to rectify the issues with our current curriculum, we plan to replace the four self-paced and the four face-to-face pre-college courses with a sequence of 15 one-credit competencies. The 15 competencies will be grouped into 3 sequences (07X, 08X, and 09X) consisting of 5 competencies apiece. Students can choose to complete the material through a new Math Center at their own pace or through a more traditionally structured classroom setting. By reducing the curriculum to 15 independent competencies, we will reduce ineffective review of previous course material; spend more time on each individual topic allowing for greater understanding of material; and allow for various paths to completion. With two-week sections, there will be more time to learn, explore and apply concepts through active learning, exposure to contextualized knowledge, and formative assessments to ensure students are fully understanding the material. To provide students with multiple means of demonstrating concept mastery, we will further develop options for alternative assessments.

Second, we recommend the adoption of a single text for the entire pre-college curriculum. By using a single text, students will be able to clearly see the progression of information presented; the completion of pre-college mathematics will be clearly defined in terms that are familiar to this population of students (i.e., finishing the book means finishing the course); students will seamlessly move between sections and instructors; and we will unify Math Center instruction and classroom instruction. Using only one text gives students a valuable and lasting resource that can be used for later review.

Third, we need to provide students the ability to enter at the appropriate place in the curriculum as well as the option to “fall back” to a lagging sequence if/when necessary. Using the COMPASS or CASAS exams for a rough placement into one of the three main sections followed by a diagnostic exam would then allow for 15 potential starting places over the

current four starting points. If a student is unable to successfully complete a competency, they will have an option to drop back to a lagging sequence or remediate themselves through the Math Center.

Fourth, in an effort to leverage the success of the Learning Commons without duplicating resources, we will create a Math Center. The MC will be an environment that allows students to work through the material at their own pace; promotes collaboration among students; provides hands-on activities for the reinforcement of concepts; is open to all math students, not just those registered in the self-paced competencies; and serves as a central location for math assistance all hours of the day. To supplement MC and classroom instruction, the MC will also host workshops throughout the quarter led by math faculty and others recruited from other departments. 'Just-in-time' workshops will be open to all math students and will cover mathematical concepts, necessary student attributes for success, and appropriate uses of technology.

While there are state-mandated outcomes for ABE instruction but not for pre-college math, there are clear parallels between ABE and the content we foresee covering in our new pre-college math curricula. We can design our courses to integrate ABE and pre-college students. Successful integration will require collaboration among financial aid, advising, testing, administrators at the dean and department chair levels, and faculty.

3B. Do you intend to address a particular aspect of your pre-college math program (e.g., a specific course or transition) rather than take a more global approach to the overall program?

- Yes
 No

**If you answered "yes" to 3B, please describe why you chose that aspect.
(max. characters: 1,000)**

**3C. At this point what is your best thinking about pursuing what is described in 3A., i.e., what strategies or approaches seem most promising to you and why?
(max. characters: 2,000)**

At the core of our plan is the removal of topic repetition in order to divide and compress the current 20 credits of traditional pre-college curriculum into 15 one-credit competency-based sections. Spending two weeks in the classroom on each competency allows faculty to fully develop each idea and include known effective pedagogical models for which we currently do not have time. The use of more applications and the use of teaching technologies will improve student mastery of the competencies.

In recognition of the fact that students have different learning styles and come from a variety

of backgrounds, we plan to encourage the use of alternative methods for demonstrating sufficient knowledge in each competency. Students will be provided with content-appropriate options such as the traditional written exam, computerized testing, oral presentations, written projects, etc.

In our current system when a student fails a course, they must repeat the entire quarter, thus resulting in a waste of time and money for both the student and the college. Under the proposed model, students will be able to fall back to a lagging classroom sequence during that quarter (see explanation in email sent to Bill Moore); remediate in the Math Commons while continuing in their current course; or possibly attend 'just-in-time' workshops to fill gaps as they happen.

3D. A critical component of this overall project is faculty leadership and program/department-wide ownership of the proposed efforts to improve pre-college math. How do you plan to involve a "critical mass" of faculty in the efforts you propose (full-time and part-time) and build a collective program commitment to collegial learning about effective educational practice in pre-college mathematics?

(max. characters: 2,000)

The majority of the math faculty, both adjunct and full time, are currently involved in the creation and development of this proposal. The administration very strongly supports a move forward.

Our project will:

- * Develop shared understanding among all faculty of the essential competencies of the pre-college curriculum;
- * Develop shared learner-centered pedagogies such as problem-based learning, the use of manipulatives, etc.;
- * Coordinate development of ABE and Math Department shared curriculum and scheduling.
- * Provide compensation or release time for curriculum development;
- * Address department concerns about COMPASS testing by reviewing technologies such as computerized testing and diagnostic placement.
- * Ensure that our collaborative team includes faculty and staff from tutoring services, academic advisors, and information literacy.

3E. What professional development, support and/or technical assistance would help you achieve your goals?

(max. characters: 2,000)

- * All Math Department members need training and assistance in the implementation of problem based learning, teaching for understanding, formative and summative assessment techniques, classroom management in an active learning environment, etc.
- * Compile a list of currently available resources (textbook printing options, web materials,

course management systems, eBooks, diagnostic assessments, etc.), determine pros and cons of each, and make selections that will best fit our needs.

* Ensure team members remain cognizant of regional and national math reform projects.

Section 4

Evaluation Plan

4A. What evidence will you use to help assess the success of the work you propose and how do you intend to gather and use that evidence?

(max. characters: 2,000)

With the help of the Office of Institutional Research, Planning, and Assessment, we will collect and analyze data on student success, retention, and persistence. The following data will be collected and analyzed for three years prior to and after the redesign:

- * length of time students spend in the pre-college math track
- * proportion of transfer students progressing to a college level math class
- * proportion of students from the pre-college track completing college level math courses with a 2.0 grade point average or better
- * proportion of students who remain in a course until its completion
- * proportion of students completing individual courses with 2.0 grade point average or better

In addition to student success, we will determine costs for both the college and students. We will calculate costs of the revised pre-college program (including salaries, equipment, etc.) and compare to previous years. We will determine costs for students to complete the pre-college sequence (based on length of time to complete pre-college sequence, including tuition and books).

To determine the impact of the changes implemented, a sample of students will be chosen to retake the placement diagnostic exam after they've completed a sequence. This will evaluate whether students are completing the courses successfully in addition to retaining the information.

We will also assess factors that lead to lengthy completion times, such as wait time for enrollment and number of attempts per course.

Lastly, we will gauge student satisfaction with delivery mode, comparing the former Math Lab courses with the newly implemented Math Center.

4B. What support/technical assistance do you envision needing in order to evaluate the impact of the work you propose?

(max. characters: 1,000)

Wendy Hall, Director, Institutional Research, Planning, and Assessment will be collecting longitudinal data tracking students through our precollege curricula.

Section 5

Sustainability Plan

5A. What is the potential for continuing, and if possible scaling up, this work beyond the grant period, and how are you addressing directly this issue of sustainability as part of your proposed work?

(max. characters: 2,000)

With committed administration and faculty, we feel we will be able to continue our work after the grant period. The project will result in a stable delivery method and should not need a continued influx of external funding. We anticipate that because of increased student success, we will offer a streamlined, more efficient schedule.

Through engagement of all department faculty in this project, there is excellent potential for continuing the precollege redesign effort and then to scale up to include college algebra, trig, and calculus. Faculty see the importance of improving our teaching and trying new ways to reach our students more effectively. The redirection to learner-centered pedagogy and commitment to a cycle of assessment and application of lessons learned is applicable to college level math instruction.

We foresee the redesign of our math track leading to calculus to achieve the same aims as the precollege redesign project, i.e., decrease time to completion and cost for students and the college, and to increase student persistence, retention, and success.

Our current sequence requires a three quarter, 15-credit sequence to enter calculus; we hope to decrease this to a two quarter (precalculus I and II), 10-credit sequence, and further develop alternatives to the calculus-track algebra.

Social science majors could be well served by taking a Math in Society course. We need to provide advising to direct students to this course.

We will share successes and challenges that come with a project of this size through a website, presentations at conferences, and perhaps even expanding to pre-college English courses.

5B. What support/technical assistance do you need in order to be able to address the long-term sustainability of the work you are proposing?

(max. characters: 1,000)

We will need storage space for the manipulatives, and ongoing IT support for computers in the Math Center. As new adjuncts are recruited, we will need to provide them with training and orientation

VP of Instruction Approval

5C. My college's Vice President of Instruction has reviewed and approved this application.



Section 6

Budget Narrative

6A. Description of how funds will be used for Project Development Salaries, Wages, and Benefits.

- * special contracts for program design
- * curriculum development
- * diagnostic placement selection
- * creating exams for math center
- * determine how to move students currently in sequence into the new system
- * master syllabi/course plans for adjunct guidance
- * coordination and delivery of training for all faculty, tutors, and advisors
- * creating and scheduling workshops
- * faculty will be reviewing texts, software packages, and other curricula to determine feasibility of adoption

6B. Description of how funds will be used for Project Development Goods and Services.

A classroom set of manipulatives (models, geometric shapes, etc.) will be purchased to provide training for faculty and tutors.

Copying to distribute newly developed course materials.

6C. Description of how funds will be used for Project Development Building Rental and Utilizations.

6D. Description of how funds will be used for Project Development Travel.

Visit three Math Departments in Washington community colleges that are part of the Achieving the Dream initiative to see how our colleagues deliver precollege math, (e.g., Tacoma, Highline, and Seattle Central). We will meet with math leads to review and discuss our common challenges and share innovations.

6E. Description of how funds will be used for Project Development Contracts.

6F. Description of how funds will be used for Instruction Salaries, Wages, and Benefits.

6G. Description of how funds will be used for Instruction Goods and Services.

6H. Description of how funds will be used for Instruction Building Rental and Utilizations.

6I. Description of how funds will be used for Instruction Travel.

6J. Description of how funds will be used for Instruction Contracts.

6K. Description of how funds will be used for Administration Salaries, Wages, and Benefits.

6L. Description of how funds will be used for Administration Goods and Services.

6M. Description of how funds will be used for Administration Building Rental and Utilizations.

6N. Description of how funds will be used for Administration Travel.

6O. Description of how funds will be used for Administration Contracts.

Budget

Institution: Lower Columbia College

Activity	Salary and Wages	Employee Benefits	Goods and Services	Building Rental & Utilizations	Travel	Contracts	Total
Project Development	\$16,100.00	\$2,900.00	\$600.00	\$0.00	\$400.00	\$0.00	\$20,000.00
Instruction	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Administration	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Total	\$16,100.00	\$2,900.00	\$600.00	\$0.00	\$400.00	\$0.00	\$20,000.00