Los Medanos College
Developmental Math Program
Overview

Research/Effective Practice

Successful developmental education programs have the following characteristics, as cited by three sources:

1. *What Works: Research-Based Best Practices in Devlopmental Education* by Dr. Hunter Boylan. This monograph reports on a 1999 national benchmarking study that was a collaboration of the National Center for Developmental Education, the Continuous Quality Improvement Network, and the American Productivity and Quality Center

2. *NADE* (National Association of Developmental Education) *Self Evaluation Guides*

3. *Basic Skills as a Foundation for Student Success*, the extensive review of the literature related to basic skills practices conducted in 2007 by the Center for Student Success, the research arm of the Research and Planning (RP) Group for California Community Colleges.

    - A set of common goals exists for all developmental courses in the same discipline.
    - Measurable objectives exist for each course with material that is carefully sequenced.
    - There is a clear sequence and linkage of developmental courses with college level courses. (Exit criteria for developmental courses are clearly aligned with entry requirements for college level courses.)
    - Critical thinking, learning strategies and active learning are hallmarks of all developmental courses.
    - Classroom assessment techniques are a regular part of developmental courses.
    - Formative evaluation is used to improve courses.
    - Professional development is consistently provided for instructors of developmental courses.
    - Adjunct faculty are treated as a valued resource, but teach no more than 50% of developmental course offerings.

LMC Current Practice (2007)

Meaningful student learning outcomes:

In addition to the traditional focus on procedural competence, our courses are designed to help students learn to solve problems in real world contexts that require more than algorithmic approaches and to use multiple representations of mathematical ideas in order to build quantitative literacy. Our program SLOs are aligned with AMATYC and NCTM standards and dovetail logically into the LMC Transfer Math Program SLOs.

Collaborative investigations into student learning:

Teaching Communities meet weekly with the goal of developing effective curriculum and pedagogy that support our program's SLOs. Teaching Communities are based on the theory that idiosyncratic efforts, while sometimes brilliant and inspiring, cannot affect the same kind of sustainable innovation fostered by a community of practice. While we respect each other as individuals, it is as a community that we build understanding and advance our own skills as teachers, and ultimately, offer our students greater opportunity to learn. Adjunct faculty are encouraged to participate and paid for their contributions to the Teaching Community.

Integration of research and best practice into curriculum and pedagogy:

The design of our precollegiate math courses and the structure of our approach to professional development has been influenced by the findings of the Trends in International Mathematics and Science Study (TIMSS). Other program features are based on a meta-analysis of the research into effective Developmental Education Programs outlined by Hunter Boylan in *What Works: Research-based Best Practices in Developmental Education.* Currently, the Teaching Communities are applying ideas from a variety of math education research, such as the National Research Council's *How Students Learn: Mathematics in the Classroom.*

Integrated assessment of student learning for the purpose of program improvement:

Each semester we holistically assess student achievement of program learning outcomes by analyzing a cross-section of final exams. This information is used to focus the future work of the Teaching Community.

Departmental commitment to developmental math:

In the Math Department over 90% of the full-time faculty teach developmental courses on a regular basis, with approximately 75% devoting the majority of their teaching load to developmental courses. Yet adjuncts teach the majority of developmental sections in both departments.

Integration of student support services:

Math Lab: With the exception of some of our arithmetic courses, all math courses at LMC have one to two hours of lab "by arrangement" as part of their design. The lab is open to students at all levels of math. Lab assignments include activities from a locally authored activities packet or computerized assignments. The math lab is located in the same building that houses math classrooms. It consists of a tutoring lab, a study lab, a computer lab, and a testing room. It is open six days a week for drop-in help and is staffed by math faculty, classified staff, and a few advanced student tutors.
Our prealgebra instructors participate in the Counseling Partnership. The Counseling Partnership is a collaboration with counselors in which counselors make in-class presentations about the importance of academic advising and other student services.

Peer tutoring: Our arithmetic, prealgebra, and Elementary Algebra courses have at least one in-class lab hour that is designated as time for personalized instruction. In these courses, with the exception of some of the arithmetic courses in which tutors are integral to the personalized mode of instruction, instructors may choose to have one or more tutors in-class during this hour or they may design other opportunities for students to receive individualized help, such as activities in the computer math lab.

Tutor training is consistent with CRLA guidelines and evaluated by the tutors via a survey. Tutors who work in developmental math classes attend a 10-hour pre-semester training, conducted by a campus tutor coordinator, and enroll in a Human Services course, taught by math faculty, for on-going training throughout the semester. The training includes material on tutoring techniques and Socratic questioning, study skills, cultural considerations, learning styles, learning disabilities, and some math content.

In-class peer tutoring is evaluated through student and instructor perception of the tutor's effectiveness, with specific survey questions keyed to each department's tutoring goals.

The Counseling Partnership is a collaboration between counselors and prealgebra instructors. Counselors make two in-class presentations, one at the beginning of the semester to introduce students to student support services and one at the end to answer questions about registration and encourage persistence. Instructors design assignments to reinforce the counseling presentation and require students to meet with a counselor to obtain an educational plan.

The goals of the Counseling Partnership are to help students

- develop an educational goal, including a major;
- identify possible obstacles to successful completion of their courses and access resources to overcome these obstacles;
- access academic counseling services and design an educational plan;
- persist in their college education.