

CONNECT Math Project

What is CONNECT?

Established in January 2003, *CONNECT* is a partnership of public higher education institutions in southeastern Massachusetts, including Bridgewater State College (BSC), Bristol Community College (BCC), Cape Cod Community College (CCCC), Massachusetts Maritime Academy (MMA), Massasoit Community College (MCC), and the University of Massachusetts Dartmouth (UMD). The goals of *CONNECT* are to improve the quality, accessibility, and affordability of higher education; and to advance the economic, educational, and cultural life of southeastern Massachusetts. This mission is realized by focusing on activities and initiatives that enhance academic programs and ease transfer of students among the institutions, foster economic development throughout the region, promote cultural programs and projects, and share expertise and resources among the campuses.

Historical Overview of the CONNECT Math Project

During the fall 2005 semester, a project to collaborate on a study of math learning outcomes was proposed to the Chief Academic Officers of the *CONNECT* institutions. Approval and allocation of resources was given for the spring 2006 term. A participant list was constructed, consisting of math faculty from each of the institutions and a facilitator. The group met throughout the spring term, setting an agenda for the semester, coming to an understanding of the issues across the campuses, creating a method of inquiry, and developing a proposal to continue the project beyond the spring 2006 term. Since then, the *CONNECT* math group has continued its work, with each person carrying out specific tasks that contribute to the project's overall goals. We have overcome challenges and continue to make progress towards achieving the project goals.

Project Goals

- To develop a compendium of the learning outcomes for college-level mathematics for the six campuses.
- To develop an articulation of the learning goals for general-education mathematics across the institutions.
- To promote greater consistency in the preparation of native and transfer students at the four-year campuses.
- To facilitate transfer of mathematics courses among the institutions.
- To open lines of communication and working relationships among math faculty in the six institutions.
- To create a clear roadmap for overcoming the challenges uncovered in this project.

Method of Inquiry

- The group established a method of collection and analysis of information on math topics, learning outcomes, modes of pedagogy, and methods of operation of comparable math courses on each campus. Courses were aligned along seven "tracks" permitting comparison among similar courses: Pre-calculus, Calculus, Liberal Arts, Computer Science/Computer Information Systems, Business, Elementary Education, and Statistics.
- The group developed a standard set of variables by which these courses can be compared, using a spreadsheet that allows a comparison across institutions of the courses in each track. The data for each track include: placement criteria, target audience, prerequisites, technology, textbook(s), list of topics, course learning outcomes, instructor profile (percentage full/part time), materials given to instructor, methods of assessment of students in the course, duration of the course (one or two semesters), and other aspects as appropriate.
- We have clarified for our purposes the differences among quantitative skills to which many courses contribute, course-specific topics, and course-specific learning outcomes, and have verified that these concepts are consistent with NEASC terminology.
 - *Departmental learning outcomes*: These are quantitative skills to which all math courses contribute. For example, one of the departmental learning outcomes at MCC is to "make estimates and approximations and judge the reasonableness of the result."
 - *Course topics*: This is the actual material delivered in a course. For example, topics in a statistics course include organizing data, average and variation, probability theory, etc.
 - *Course learning outcomes*: These view courses from the perspective of the skills students are able to demonstrate after taking a course. An example of a learning outcome for a statistics course is for students to be able to "use the standard procedures involved in hypothesis testing in order to determine if a claim is supported by the sample data."

Specific benefits to date

- Greater clarity among all of our institutions in how the transfer of math courses is governed.
- Improved understanding of the requirements imposed by BHE and DOE for elementary and early childhood education majors, and the changes to upcoming BSC math courses for these students.
- Understanding of upcoming changes in all math courses, resulting in:
 - MCC considering a finite math course to meet the needs of UMD-bound students.
 - BCC initiating an update of their advising system to accommodate the new core curriculum at BSC.
 - CCCC developing a sequence of two math courses for elementary and early childhood education majors to mirror the two courses at BSC.
 - Changes to the transfer information as a result of the new core at BSC.
- Development of a website <http://webhost.bridgew.edu/rpitt/>, for project participants for sharing documents and information.
- Collection of departmental learning outcomes for each institution.
- Collection of data on course topics, course learning outcomes, course delivery systems, and other variables of comparison across each institution.
- Survey of the national scene on math learning outcomes, with useful information obtained from other institutions.
- Development of good communication and a shared sense of trust and concern among the math faculty participants, which will yield positive benefits for years to come.

Challenges

- Finding common meeting times.
- Fostering equal participation among the six campuses.
- Reporting on our work and securing ongoing funding for the project.
- Addressing the complexity of the tasks involved for each of the seven tracks.
- Collecting comparable data on math learning outcomes from six institutions which were in different stages of articulating such outcomes.
- Dealing with the lack of consistency of course topics within and among institutions.
- Understanding the BHE and DOE regulations and requirements for education majors.

Goals for the next year

- Synthesize the information collected on comparable math courses.
- Synthesize the information collected on departmental learning outcomes.
- Disseminate our data and findings to math faculty on the *CONNECT* campuses.
- Develop a teaching resource useful for adjunct faculty.
- Act as a resource for new and existing consortia at various locations around the state.
- Disseminate our findings to the larger math community.
- Develop mechanisms for future communication.

Project Participants

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