Allegany College of Maryland

Using Problem-Based Learning to Create an Integrative Curriculum Approach to Developmental Mathematics and the Health Professions

Grant Number: P116B001670
Start Date: 10/01/2000
End Date: 09/30/2003
Funding: $228,162.00
Comprehensive Program

Abstract

More than ever, postsecondary students are required to complete developmental mathematics courses prior to taking college-level mathematics courses. Unfortunately, these developmental courses have little or no relevance to students' career goals. Because of this lack of relevance, students lose interest in their mathematics courses and many either fail or withdraw from college. This project revises the mathematics curriculum to meet the needs of students interested in the health professions.

Through this grant, faculty from the mathematics and health career programs attend courses in each other's field. Faculty members also obtain information on each other's discipline from their colleagues, books, tutoring, software, videotapes, or outside help from health professionals. Additionally, faculty members schedule meetings to share concepts and applications as they revise the developmental mathematics curriculum.

The project has developed a 396-page developmental mathematics textbook written in a problem-based learning format. The new textbook is bundled with the current textbook and available with many other resources on our website. Other online resources include videos of lessons, some of which use a TI-83 Plus emulator.

One difficulty with this project has been meeting the needs of students planning a health career as well as those not interested in this profession and those who will continue on to pre-calculus courses. To resolve this problem, several classes use the developmental mathematics curriculum without health career references.

Another change instituted is the prohibition of the use of a calculator during exams. Many students pursuing health careers will not be allowed to use a calculator during the required Board Exams; this project simulates that event.

The coursework directly related to health fields increased from 0 percent to 30 percent during the first project year, and increased to 50 percent in the second year. All project objectives were reached. Also, information about the project was presented by nursing and mathematics faculty at several conferences.

A test and survey were developed and found to be reliable (Cronbach alpha level > .7). The evaluation of the first and second year data showed that students in the problem-based learning (PBL) groups scored significantly higher than students in the control group, with a mean score of more than twice that of the control group. Survey information shows that students in the PBL classes thought the course was significantly more likely to be useful in their health field.

The project was awarded a grant from Allegheny Energy (MD). Nursing faculty were also awarded "Best Paper" at a national conference.

Organization Type: Public College or University
Institution Type: 2-Year
Special Designation: Community College

Web Sites:
Allegany College Dept. of Math & Engineering
http://www.allegany.edu/Department/math.html

Allegany College FIPSE Project
http://www.allegany.edu/Department/math/fipse.html

Graphing calculator help for TIs and Casios
http://www.allegany.edu/Department/math/page1.html

Placement test review problems

Mark Shore
Project Director
Allegany College of Maryland
12401 Willowbrook Road SE
Cumberland, MD 21502
Tel: (301) 784-5371
Fax: (301) 784-5060

E-mail:
mshore@
ac.cc.md.us

http://www.allegany.edu/math/placement.html

Student curve fitting projects
http://www.allegany.edu/Department/math/projects.html

TI-83 Plus graphing calculator video
http://www.allegany.edu/Department/math/bglessons.htm

SUBJECTS:

- o o o Health and Medicine
- o o o Problem-Based Learning
- o o Curricular Reform
- o o Mathematics
- o o STEM

Subject Key:

- o o o Highly relevant
- o o Relevant
- o Slightly relevant