CALIFORNIA COMMUNITY COLLEGES
AND
STATE CENTER
COMMUNITY COLLEGE DISTRICT

#89-0027
Co-Operative Learning as a Format for Developmental Math Curriculum

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<th>ELIGIBLE PROGRAM</th>
<th>PROJECT CATEGORY</th>
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<td>Grant = $15,000</td>
<td>B --- Improving Teaching Ability</td>
<td>Curriculum Design</td>
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<th>PROJECT PRODUCT</th>
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<th>PROJECT DIRECTOR</th>
<th>PROJECT SUPERVISOR</th>
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<td>Barbara Buhr, Math Instructor</td>
<td>Ray Cramer, Division Dean</td>
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This project developed a comprehensive model for non-traditional methods of teaching developmental mathematics to educationally disadvantaged students. Methods employed included cooperative learning groups and mastery learning. Instructors were provided with an Instructor's Manual as well as workshops in addressing this new curricular approach to developmental mathematics.
Co-operative Learning as a Format for Developmental Math Curriculum

Fresno City College, through the Math Science and Engineering Division proposes to develop teaching and learning materials for use by instructors who are engaged in teaching developmental math. Since the implementation of AB1725, Fresno City College has been teaching developmental mathematics using a non-traditional approach including cooperative learning groups and mastery learning. To ensure the use of these methods all developmental math instructors need in-service and an instructor’s manual in order to help them fully understand appropriate teaching approach for this particular course. Furthermore, Fresno City College currently has no formal program to help enhance the faculty members ability to teach developmental math. The development of an instructional manual will help full and part-time faculty members in their efforts to address the special learning needs of educationally disadvantaged students.

An important aspect of this project will be the review, inventory and compilation of instructional material to be used in class by instructors. In addition this information will be developed into a useful teaching and learning guide for faculty. Other written educational support material and software will be purchased and made available to faculty and students. Training of faculty through in-Service training activities during will also be important features of this project.

It is anticipated that this project will result in the development of model comprehensive developmental teaching and learning programs that can be used by developmental math teachers throughout the State.
1. Specific Educational Program Being Addressed

SPECIFIC EDUCATIONAL PROGRAM BEING ADDRESSED
This developmental mathematics educational program is designed to address the following specific educational programs (Article 7; 84381b;c, and f)
   a. Improving teaching methods of faculty members
   b. Special learning needs of educationally disadvantaged students
   c. programs for the improvement of and development of faculty and staff.

Moreover, this project embraces the following areas of the Board of Governors 1988-89 Basic Agenda priorities:
   a. Basic Skills Instruction
   b. The Underrepresented
   c. The Underprepared
   d. Faculty and Staff development.

Fresno City College proposes to initiate this project for the purpose of helping students achieve their educational goals and objectives.
2. Specific Problems Being Addressed

SPECIFIC PROBLEMS BEING ADDRESSED
Description of The Problem(s)

Similar to other community colleges throughout California, Fresno City College has no systematic method to expand and improve the pre-service training for faculty in developmental math courses. Likewise, Fresno City College has no organized method in place to upgrade the teaching techniques and instructional materials for full and/or part-time faculty. Furthermore at Fresno City College the typical at-risk student enrolled in math courses is approximately four levels below grade level. This is indicated by the results of the assessment tests that Fresno City College requires students to take when they enter the college. College statistics relative to the level of achievement in math and at-risk students completion rates of math courses reveal a high attrition rate and low academic performance. Fresno City College is presently implementing a new format for developmental math using cooperative learning as a format with small groups and low student/teacher ratio by utilizing team teaching and student aids. This is a non-traditional approach allowing students to be placed according to mastery of concepts and to allow them to progress through the sequence of mathematical skills at a pace consistent with their individual abilities.

In order to insure the course is taught using cooperative learning groups instead of the traditional lecture method, in-service of teachers and an instructor’s manual need to be developed to show the rationale and positive results of this non-traditional approach. Moreover, Fresno City College is implementing a mentoring program. The instructor’s manual could be used as a part of that program.

Specific problems being addressed by this project include:

a. Fresno City College presently does not have a pre-service training program for part-time faculty members in developmental math. Traditionally, FCC has used a large number of part-time instructors to teach developmental math; these instructors have no manual outlining the most effective approach(es) to teach the course.

b. The instructional and educational support material relating to developmental math is not organized and housed in a central location. Therefore, interested instructors do not know how to access material that could enhance the delivery of instruction to students.

c. There is no systematic and on-going method in practice to show or demonstrate effective teaching techniques, use of technology, etc. This project will enhance faculty members’ ability to: (1) effectively teach developmental math; and (2) reach underprepared and educationally disadvantaged students.

d. The developmental faculty in mathematics presently has no teaching manual. This
The project will provide resources and personnel to develop a comprehensive teaching manual that can be used by campus and district teachers. It is also anticipated that the materials developed will serve as a useful model for other community college districts.
3. Population To Be Served

POPULATION(S) TO BE SERVED
The target population for this project will be full-/part-time instructors in the developmental mathematics program. The students enrolled in the courses will also be direct recipients of the benefits derived from this project. Approximately 1,800 students are enrolled in these courses during the academic year. Traditionally the students enrolled in the developmental math courses are four levels below grade level and represent a high percentage of minority students, single parents, low academic (underprepared) achievers, and show low course completion rates.

Lastly, the instructors are usually new and part-time, many of whom have received little (if any) pre-service training in developmental education prior to assuming the assignment in the division.
4. Objectives

[CONSULT PRINT DOCUMENT FOR CHART.]
The personnel requests supported by this project are as follows:

- One project director: 0.75
- Clerical support: 0.25
- Consultants to in-service participants at conference.

All other personnel costs related to the project will be in-kind contributions by the District. Specific staff providing in-kind contributions include:

- Associate Dean of Instruction: 0.10
- Development Ed Director: 0.10
- Clerical support: 0.25

Equipment for this project will be limited to the following:

1. Mobile carts for transporting materials from one classroom to another.
2. Software to enhance instructional delivery and skills.
3. Additional commercial materials in critical thinking and problem solving.
4. Software to enhance student learning.
6. Expected Outcomes

EXPECTED OUTCOMES

A. Project Objectives

The primary objectives of this project are to develop a comprehensive for developmental math instructors; enhance the teacher training manual teaching skills of math instructors; improve retention of underrepresented students in developmental mathematics courses at FCC; enhance students’ academic competencies by providing additional resources and training for faculty. (See Table one for additional details regarding project objectives.)

B. Probable or Eventual Impact

This project is structured to establish a systematic pre-service training program for part-time, developmental instructors. It will also enhance the skills of instructors and strengthen student learning. It is designed to have the following long term effects:

1. Improve retention of underrepresented students
2. Improve and strengthen faculty competencies
3. Fresno City College will serve as a resource for other California community colleges in this area.

C. Potential For Continued Support

This program has the potential to be supported after the expiration of the project. This is evident by the interest in the project from other programs that are designed to meet the needs of underrepresented students (i.e. EOPS, Enabler, ESL, GAIN, etc.). Moreover, the college is consistently working to develop the developmental program and is expected to expand its support of programs similar to this project to include other disciplines. Lastly, the college has consistently demonstrated its willingness to support improvement of instruction. The in-service training sessions will be videotaped and can be used for future pre-service sessions.

D. Potential for Adaptation

The development of the instructor's manual increases the potential for adaptation of this project by other institutions or programs. A random survey of over twenty institutions revealed that no comprehensive instructor's manual or student tutor manual existed in the format proposed by this project. And, further, currently very little is being done in the area of pre-service training for part-time developmental math instructors. The proposed product will address this void because it will be developed in a manner which can be readily adapted to different institutions.
7. Evaluation Plan

EVALUATION PLAN
The evaluation plan is structured to consist of the following:

1. A determination of the College's effectiveness in creating an instructor's Manual
2. The College's effectiveness in developing the student tutor's handbook
3. The number and effectiveness of the pre-training activities
4. The number and effectiveness of the dissemination activities
5. The College's willingness to support the project activities after the expiration of the project
6. Long term effectiveness will be determined by reviewing the students retention rates in developmental math courses.

The project director will assume the primary responsibility for the project. Assistance will be provided by the office of Institutional Research. Appropriate survey instruments will be developed and administered to faculty participating in teaching the classes and in service seminars to ascertain whether faculty perceives the manual training sessions as useful. Students will be surveyed to determine their response.
DISSEMINATION
The products of this project will be shared with instructors at both Fresno City College and Kings River Community College in pre-service training sessions. The dissemination plans also include provisions for FCC to host a regional conference to in-service other math teachers from surrounding colleges within the region. Other colleges that will be invited to participate in this regional conference include Bakersfield, Kings River Community College, COS, West Hills College, KRCC, Fresno City College, Merced, Modesto and Porterville. Moreover, the project director anticipates presenting the program model at the following professional association meetings:
   a. California Mathematics Council
   b. American Mathematics Association of Two Year Colleges

FCC will also coordinate dissemination activities with other interested colleges throughout the state. Additionally, the project director, in collaboration with other instructors and staff may also publish articles in the local district publication and California community college's newsletter.
9. Budget Narrative

[NO "BUDGET NARRATIVE" ACCOMPANIES THIS DOCUMENT.]