During the 1981-82 school year the Math I program underwent a revitalization.

Prior to this time the Math I class had been organized as a three unit course in which students attended two hours per week under the supervision of an instructor aided by classroom tutors. Students were required to attend a third hour per week in an unsupervised lab situation. Students received credit when they completed all three units of the course and grades were assigned according to the student's performance on four tests.

The class structure was altered during the Fall 1981 Semester to allow a variable unit approach. If a student completed 1/3 of the material, one unit of credit was awarded; for completing 2/3 of the course, 2 units were awarded; and for completing the entire course, 3 units were awarded. An additional one unit course in pre-algebra was developed to serve the needs of students who planned to enroll in elementary algebra.

During the Spring 1982 Semester more structure was introduced into the class. Study guides provided greater direction in charting student progress. Mini tests were introduced to ensure mastery of subject matter prior to final examinations.

Prior to Fall 1981 the percentage of students completing Math I successfully in one semester was in the 30%-40% range. During the Fall 1981 Semester approximately 58% of the students achieved some degree of success in Math I. In the Spring 1982 Semester this percentage increased to 68%. We are encouraged with these results and now feel that we have a successful approach for basic mathematics instruction at Santa Barbara City College.
MEMORANDUM

TO: Pat Huglin, Dean of Instruction
FROM: Jane Craven, Jim Edmondson
DATE: May 14, 1982
RE: Final Report, Math 1 Project

Introduction and Brief History of Basic Math at SBCC

Prior to fall 1969, Math 1 was taught in a traditional lecture format by the SBCC Math Department. This method was neither cost effective nor was it an effective format for student learning. Beginning with the Fall 1969 semester, the class was offered with programmed materials and tutors were introduced into the classroom to help direct student efforts. Under the direction of Bob Carman, a new textbook was written and a nonpunitive testing system employing a specialized testing tutor was introduced. Under this system there were no hourly instructors, only a tester, a director and tutors to serve the students. These techniques were well received by the students and were very cost effective.

In approximately 1975, four hourly instructors were hired to provide more structure and continuity and to satisfy state laws demanding that a certificated person be on duty if ADA funds were to be collected. At first, the students met with their instructor only one hour per week and studied on their own in the LAC an additional two hours per week. Although all of these steps were improvements in the program, Math 1 continued to be plagued with a very high dropout rate.

Beginning in 1978, at the insistence of the Math Department, students were required to meet two hours per week with their instructor and to attend one additional hour per week in the LAC. It became clear at this time that merely requiring more student-instructor contact would not, by itself, increase student retention. The daily routine of students was to pick up a practice test for the unit they were studying (there were four such units in 1978) and work through it, getting tutor help when problems were encountered. In most cases the students did not study their textbooks in a systematic manner. There was no structure to assure that the material was learned thoroughly before a test was taken, and there was very little instructor-student contact or instructor responsibility. Consequently, students had many gaps in their mathematical backgrounds and were often not able to pass the last test in order to receive the three units of credit granted for the course. Some segments of the college community became dissatisfied with the course. In fact, EOPS began offering its own version of basic math with 3 student-instructor contact hours per week, added instructor responsibility and added internal course structure.

During the spring of 1981, a committee was formed to guide a restructuring of the Math 1 program with the hope that the attrition rate could be reduced and that student needs could be better served. The committee consisted of Dick Sanchez, Pablo Buckelew, Gil Robledo, Judy Schuck, and Sue Culler. Jim Edmondson and Jane Craven were given the responsibility for the direction of the restructuring program.
The fall semester was spent studying our own program and the basic math programs at other colleges. A modular or variable unit approach to the granting of credit in Math 1 was instituted, a pre-algebra course, Math 3, was developed, and the first steps in supplying a more structured course for students were taken. In all cases the idea was to build upon and to strengthen the framework developed over the years by others.

FINAL REPORT

Beginning summer, 1982, the Math 1 program will undergo significant changes in order to make the course more beneficial for students and to further reduce the attrition rate. Already, modifications made to the existing Math 1 program have increased retention and seem to be more satisfying to students.

Modularization

The course was modularized into three components: 1) whole numbers, 2) fractions and decimal computation, and 3) decimal operations and percentages. Students received one unit of credit for each unit completed. Those students completing three units were encouraged to enroll in Math 3, a one-unit, pre-algebra course designed to bridge the gap between Math 1, Basic Mathematics, and Math 7, Beginning Algebra. Math 3 was also made available to students experiencing difficulties in Math 7. Math 3 was not offered until the fifth week of the semester. During the year, approximately 225 students enrolled in Math 3. Modularizing Math 1 in this way seemed to be motivational for students. Students finishing the course rapidly could continue improving their math skills. Students unable to complete all three units still received credit for what they did complete.

Student Guides

Another improvement was the introduction of student guides. These were designed to indicate to students the topics that they should study and the problems they should work prior to taking each unit test. The guides also served as a record for tutors and instructors as to the individual student's progress. All items listed on the student guides had to be corrected and signed off by either a tutor or the instructor prior to taking the unit tests. This process reduced the re-taking of the unit finals greatly, made students more accountable for what was expected, and made clear course expectations.

In-Class Tests

In-class tests for each topic within a module were also devised as mastery tests. These were for student use to assist him/her in determining whether or not he/she had command of the skills just studied. These also had to be signed off on the student guides before the student moved on to another topic. In theory, these mini-tests were a positive step. However, they did not work as envisioned because many students received help with the problems and because the students were able to correct the tests themselves. This idea of breaking each unit into smaller units with a mastery requirement for each will be incorporated into the Math 1 program beginning Summer, 1982 in a more functional and controlled way.
Videotapes

One of the most effective instructional tools incorporated this semester was the use of Math videotapes which dealt with the majority of topics covered in Math 1. These were obtained from Pasadena City College at essentially no cost. This semester, students were not required to view these tapes, but were encouraged to do so during their lab hour in the Learning Assistance Center. The videotapes are excellent teaching tapes and as Math 1 hourly instructors do little or no lecturing, they have become an integral part of the teaching-learning process and are heavily utilized.

Testing

Greater communications between hourly instructors and testers has also been achieved by moving testing for Math 1 from the Learning Assistance Center to L-207. Although this is not the ideal because of noise, space, and furniture problems, testers have been better able to alert instructors to student problems.

Tutor Training

A series of tutor training sessions for Math 1 tutors were also instituted this semester. Although not mandatory, these sessions were well attended. The purpose of these sessions was to allow tutors to discuss problems encountered in class, and to discuss the best methods of teaching various topics. A tutorial guide was also developed and distributed to each tutor. The tutors have indicated that the tutorial guide and the monthly tutor training sessions were beneficial.

Recordkeeping

A different system of attendance was also begun. A time clock was installed in L-207 and students were required to clock in and out of class. In the past, it seemed that the hourly instructors spent a large part of each instructional hour calling roll and marking attendance for both late and make-up students. The purpose of the time clock was to increase the time instructors worked with students. It was also a way to keep positive attendance, required for courses with open entry, open exit format. The time clock has worked out well. However, collating attendance in L-207 with the lab hour has been quite cumbersome. Beginning summer, 1982, there will no longer be a lab requirement for Math 1, so the recordkeeping task will be greatly simplified. At the end of the sixth and ninth weeks, postcards were sent to students whose attendance was not consistent or who had not completed the unit final for Module A.

Statistics informally compiled are most encouraging. Prior to fall, 1981, the dropout rate for Math 1 was approximately 60-65 percent. Fall, 1981, after course modularization, the dropout rate decreased to approximately forty percent. The appendix contains a breakdown of the grades and unit credits the students received during the Fall 1981 semester and a 10th week progress report organized by instructor for the Spring 1982 semester.

Beginning summer, 1982, permanent changes will be incorporated into Math 1. These changes have been designed to make the course more beneficial to students and to increase retention. Both Jane Craven and Jim Edmondson, co-ordinators of this project for the past two semesters, will be teaching Math 1 this summer. The purpose is to be able to work out any problems which may arise during the summer, as opposed to during the fall when hourly instructors will be responsible for instruction.
A suggested schedule for taking both Achievement and Unit Test will be provided to students.
Student Guides

Student guides must be completed for each chapter. These will serve as a record of each student's progress, work completed, and any prescription needed. Student guides must be completed prior to taking the Achievement Test for any chapter.

Videotapes

As mentioned, students will be required to watch videotapes dealing with fractions, decimals, ratio, proportion, and percent. This will be an integral part of Math I. Because of the nature of the course and the size of the classes, it is extremely difficult to lecture. The videos will serve as teaching tools. However, we do feel the hourly instructors should engage part of the class in mini-lectures during the week. The recordkeeping system to be implemented will allow instructors to determine where the majority of students are in terms of progress and base lecture topic(s) on this information. We believe some lecturing is necessary to reinforce the required video presentations and to further clarify difficult concepts.

Videotapes will be housed in the Learning Assistance Center for student's use. Viewing the tapes is a course requirement. Should this overload the Learning Assistance Center, it may be necessary to hold group showings at scheduled intervals in L-210. Approximately five hours of viewing time is required to complete three units. While viewing the videotapes, students will be expected to take notes in the Viewer's Guide to Accompany Computational Arithmetic. These chapter notes are fairly structured requiring the student to fill in blanks and complete certain problems. Thus, the process is interactive and far more effective than just viewing.

Tutors

Tutors will continue to work as they presently do. However, one is to be assigned the duty of proctor. It will be his/her job to check that students have completed the required work successfully and are ready to attempt the Achievement Test. Achievement Tests will be administered by the Tester. There are four forms of each Achievement Test.

Recordkeeping

Students will be required to spend three hours per week in L-207. The present lab requirement will be dropped. Positive attendance will be taken. Students will be required to clock in and out of class. Roll will be taken once a week to enable the instructor to get to know his/her students by name and to communicate with them regarding poor attendance and/or lack of progress in meeting test deadlines.

Recordkeeping will become more comprehensive, manageable, and accessible. Testers will be responsible for recording hours students have spent in class each week on a student record card. The student record card will also contain information on student's success/failure on the Achievement Tests and unit final exams. These records will be kept by class in notebooks for instructor use. Reviewing these prior to the first class meeting each week will indicate to the instructor what topics students are working on and also which students have not been attending the required hours. In general, these student record cards will make the instructor more aware of student needs.
Role of the Hourly Instructor

The role of the hourly instructor will be expanded. He/she will be the instructor of record and be required to perform the associated duties. The hourly instructor will be responsible for knowing his/her students, their progress, and attendance. Attendance and test progress will be updated on a weekly basis by the Testers. It will be part of the Instructor's responsibility to talk to students based on this information or to send a postcard indicating poor attendance/performance and encouraging the student to return to class. Students making consistent efforts but unable to make significant progress will be referred to the Learning Disabilities Specialist for diagnostic testing. As mentioned, he/she will be encouraged to lecture at least once a week. Attendance at scheduled monthly meetings with the Director of Math I will also be a requirement.

Recommendations

We would like to conclude the report with some recommendations for the 1982-83 school year. First of all, L-207 should be carpeted as a noise abatement procedure. Secondly, more suitable carrels or tables should be obtained so that more students can be accommodated in the testing area. The program may need access to a videotape playback machine and monitor for group showings of the videotapes in L-210. At some point next year it may become advisable to install folding doors or more permanent partitions to separate the testing area from the rest of the classroom.

The Director of the program should receive 8 TLU's for the Fall semester to complete the implementation of the new system and the maintenance level of 6 TLU's for the Director should be reached in the spring of 1983. The Math I Advisory Committee will probably meet less frequently in the coming years, perhaps once each semester for progress reports.

The directors of Math I and the Math I committee recommend that Math I continue to be staffed by hourly instructors and that the classes meet three hours per week with their hourly instructor beginning in the fall of 1982. This is as opposed to the previous structure of 2 hours with an hourly instructor and one additional hour in the LAC. This recommendation has already been approved by the Instruction Office.

It should be pointed out that many changes have been made in the Math I program and more are yet to come during the summer and fall of 1982. All of the changes are in the direction of demanding a more steady performance from the student and in supplying that student with a better support structure so that he/she can meet the performance standards of the course. The student has been given more readily obtainable goals through the introduction of Modules; he/she has been supplied with a more flexible, open entry course; and he/she has been given an opportunity to learn more material to better prepare him/her for algebra with the introduction of Math 3.

We will continue to carefully monitor the effects of these changes, but we feel that by spring 1983, Math I should enter a stable phase with only occasional adjustments being necessary.
To: Math 1 Committee Members
From: Jim Edmondson, Director Math 1
Subject: Preliminary grading statistics for Math 1 -- Fall 1981
Date: March 3, 1982

The figures below give a break down of the grades given in Math 1 for the fall 1981 semester. 710 students were enrolled in Math 1 at the 4th week of classes. Students could receive from 1 to 3 units and a letter grade of A, B, C, F or W. As it turned out, no F or I grades were given.

N=710

Table 1 -- Students receiving 1 unit of credit $N_1=110$ (15%)

<table>
<thead>
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<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
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<tbody>
<tr>
<td></td>
<td>66</td>
<td>38</td>
<td>6</td>
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<tr>
<td>9%</td>
<td>5%</td>
<td>1%</td>
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Table 2 -- Students receiving 2 units of credit $N_2=118$ (17%)

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<th>C</th>
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<tbody>
<tr>
<td></td>
<td>92</td>
<td>23</td>
<td>3</td>
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<tr>
<td>13%</td>
<td>3%</td>
<td>0%</td>
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Table 3 -- Students receiving 3 units of credit $N_3=197$ (28%)

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<td></td>
<td>162</td>
<td>34</td>
<td>1</td>
</tr>
<tr>
<td>23%</td>
<td>5%</td>
<td>0%</td>
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</table>

Total A's given -- 320 (45%)
Total B's given -- 95 (13%)
Total C's given -- 10 (1%)

There were 285 W grades, all posted before the 14th week of classes, for a 40% attrition rate. This compares favorably with attrition rates which were previously in the 60% range. We look forward to reducing this attrition rate as the new format for the class is implemented during the spring 1982 semester.
Total number of students enrolled was 607

<table>
<thead>
<tr>
<th>Instructor</th>
<th>Number of units passed</th>
<th>instructor total</th>
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<tbody>
<tr>
<td></td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>HALL (MW)</td>
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<tr>
<td></td>
<td>13%</td>
<td>64%</td>
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<tr>
<td>LEONG (TTh)</td>
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<td></td>
<td>10%</td>
<td>57%</td>
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<tr>
<td>FINUCANE (Night)</td>
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<tr>
<td></td>
<td>14%</td>
<td>51%</td>
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<tr>
<td>Overall performance</td>
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<td>352</td>
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<tr>
<td></td>
<td>12%</td>
<td>58%</td>
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