

**PROGRAM REVIEW
MATH FOR TEACHERS PROGRAM
(Math 110, 111, 115, 116)**

**Judy Kasabian
Lars Kjeseth
Eduardo Morales
Susie Tummers Stocum**

April 2011

TABLE OF CONTENTS

Overview of the Program	3
Analysis of Institutional Research Data	5
Curriculum--Course, Content, and Articulation	6
Student Learning Outcomes (SLOs)	7
Facilities, Equipment, and Technology	11
Staffing	13
Planning	13
Conclusion and Summary	14
Appendix – Data provided by ECC Institutional Research Department	

I. Overview

Description of Program

The Math for Teachers Program provides an opportunity for all students to have a rich and deep experience in mathematics, so that they will be able to teach quality mathematics to elementary school students. Predominantly, the courses within the program serve as the lower division math requirements for students intending to transfer to a 4-year institution as Liberal Studies majors intending to be elementary school teachers.

The Math for Teachers Program at El Camino College consists of three courses: Structures/Concepts in Mathematics (Math 110 – 3 units, 3 hours lecture), Probability and Statistics for Prospective Elementary School Teachers (Math 115 – 4 units, 4 hours lecture) and Geometry and Measurement for Prospective Elementary School Teachers (Math 116 – 4 units, 4 hours lecture). One additional course remains within the program: Probability, Statistics, and Geometry for Prospective Elementary School Teachers (Math 111 – 3 units, 3 hours lecture), which is offered only at the Compton Education Center. The Math 111 course has not been offered at the El Camino College campus since fall 2008 as will be discussed in the Status of Previous Recommendations.

Mathematics content courses for pre-service teachers have been offered at El Camino College since the 1960's. Until the early 2000's, El Camino College offered two content courses for students considering a career in teaching (Math 110 and Math 111). On a national level, evidence suggested that a more rigorous mathematics program for potential classroom teachers in the elementary grades would better prepare them to teach not only how to solve pertinent mathematical problems but understand the underlying concepts. This stance was adopted by the leading national organizations for mathematics teachers, the National Council of Teachers of Mathematics and the American Mathematical Association for Two-Year Colleges. At the same time, the state now requires all potential elementary school teachers to pass the Content Subject Examination for Teachers (CSET) as a condition for admission into the teaching credential program at baccalaureate institutions. For prospective elementary school teachers, they must successfully complete three subtests (mathematics and science, language arts and social studies, and human development and the arts). El Camino College responded to these external factors by restructuring the courses for pre-service elementary school teachers. Greater depth was added to the content of Structures/Concepts in Mathematics (Math 110) and Probability, Statistics, and Geometry for Prospective Elementary School Teachers (Math 111) was discarded in favor of two new courses: Probability and Statistics for Prospective Elementary School Teachers (Math 115) and Geometry and Measurement for Prospective Elementary School Teachers (Math 116). The new, three-course program mimics the curriculum at CSULB and its content is generally in line the curriculum at most CSUs.

The three-course program serves students preparing for the CSET well. In 2005, El Camino College mathematics faculty prepared a report which documents the mathematics items on the CSET to the two sequences of mathematics content courses for pre-service teachers (Math 110/111 and Math 110/115/116). The report concludes that the content presented in the three course sequence (Math 110/115/116), address all of the required content for the mathematics portion of the CSET for elementary school teachers; the old sequence (Math 110/111) does not.

The Math for Teachers courses attract predominately two types of students. Many students who are fairly new to the college environment; are full-time students (or nearly so); and want to become elementary school teachers. Other students may be returning after having some previous career or students who currently work in the K-12 classrooms in some capacity and are working toward becoming credentialed teachers. The courses are offered at various times of the day to accommodate both of these types of students. In some cases, these courses also attract a handful of general education students who are not planning to become teachers.

Over the last decade, enrollment has fluctuated in the program's courses. For example, in 2006-07 academic year, there were 11 sections of Math for Teachers courses offered and in the 2009-10 academic year, that number has fallen to 8 sections. In the 2008-09 academic year, our seat count was at its lowest point (238) and was highest in 2006-07 (270). While the enrollment data may be a result of the state of the teaching profession in California, we believe the more likely reason for the decline is both a counseling and curriculum issue.

Status of Previous Recommendations

Recommendation 2004A: (Dedicated Classroom) The Math for Teachers Program was in dire need of its own classroom that could be used for the core courses. This space would need to have adequate storage space and serve as a place for the students in the program to meet and form study groups. The manipulatives that are used in class would need to be available to the students to ensure that any student that needed extra assistance in learning concepts with the manipulatives would be granted access. (Facilities and Equipment)

Status of Recommendation 2004A: Currently, the situation is much improved. A classroom is semi-dedicated to the Math for Teachers courses (MBBM 114). On occasion, Math for Teachers core courses have been scheduled in inappropriate classrooms, but we expect that when we move to the new building, a permanent dedicated classroom will be set up. Until that happens, this recommendation will stay in place in our overall plan.

Recommendation 2004B: (Staying Current with Articulation Issues) As state credentialing requirements change, it is imperative that our courses remain current and appropriate and that students are aware of the articulation of these courses with their transfer institution to assist them in a seamless transfer to the four-year institution. The faculty in the Math for Teachers program should continue to work with the counselors to remain up-to-date with the transfer institution requirements. (Curriculum)

Status of Recommendation 2004B: In addition to continued conversations with counselors and our articulation officer, we also conducted an exhaustive comparison between the content of our core courses and the content of the CSET examination and continue to compare our courses with local CSUs. These processes are now regular parts of our course review process, so we are confident that our core courses contain the content necessary for students to pass the CSET and succeed in a credentialing program at a 4-year institution. We consider this recommendation complete.

Recommendation 2004C: (Streamlining the Program Course Sequence) The faculty of the program will continue to discuss the feasibility of switching from a two-tiered program (Program 1: Math 110, Math 111; Program 2: Math 110, Math 115, Math 116) to a one-tiered program (Math 110, Math 115, Math 116). This change would allow students to gain a greater conceptual understanding of the mathematics they will be teaching. If the change takes place, it must be done so that the transfer of our students to 4-year institutions is not jeopardized. (Planning)

Status of Recommendation 2004C: After extensive research into the content of the CSET examination and the curriculum at local CSUs, the ECC – Torrance faculty made the decision to eliminate the two-course sequence (Math 110, Math 111) in favor of the three-course sequence (Math 110, Math 115, Math 116). As a result, we have phased Math 111 out of our course offerings at ECC – Torrance. Faculty at the Compton Education Center still offer Math 111 once a year, but have difficulty filling the class. There are no articulation problems with the three-course sequence, although counselors have concerns that Liberal Studies students transfer with too many credits. In response, we will revise the three courses so that they are aligned not only in content with the three-course sequence at CSULB, but also in terms of units and number and types of contact hours. As a result, students who finish the three-course sequence will earn 9 course units rather than 11. See **Recommendation 2011A**.

II. Analysis of Institutional Research Data

Analysis of Course Grade Distribution, Success Rates, Retention Rates

The course grade distribution, success rate and retention rate data for the Math for Teachers Program show that courses exceed, by a large margin, the averages of all other math courses, both at ECC and across the state.

These high averages can be attributed to several factors. Most importantly, students in this program are motivated and excited to become teachers and see this class as relevant and important for their careers. These are active classes with multiple assessment measures. The faculty work continuously to create new ways to help students gain deeper conceptual understanding in addition to procedural knowledge. The small size of this program also allows for more frequent collaborations among the teachers about ways to improve student learning. The team is committed to ongoing assessments of student learning outcomes and brainstorming regarding concepts that sometimes make students struggle is commonplace among the teachers in this program.

Analysis of Enrollment Statistics

The students in this program are predominantly female (roughly 80%) and generally fall into two age groups: 18-21 (roughly 30%) and 25-39 (roughly 20%). Students are heavily daytime students, although our evening course offerings always fill. Half of the students are fulltime and half are part-time. The race and ethnicity mix of our students generally reflects the ECC district demographics, although roughly 45% of our students are Latinas/os, compared with roughly 30% of the ECC district population. The statistics support what we generally believe about our student population. Many students are fairly new to college and are full-time students (or nearly so). Other students are be returning to school after pursuing another career or are currently work in the K-12 classrooms in some capacity. What unites our students is that the overwhelming majority of want to become credentialed elementary school teachers.

The only change in our course offerings in the past four years has been a decrease in the number of sections of Math 110 offered each year. Four years ago, we offered six sections of Math 110 a year; currently we are offering only four sections. There has been no change in the number of sections of Math 115 and Math 116 offered each year. Over the last four years, our total seat count has remained fairly constant, so it is no surprise that our fill rates for these courses has increased from roughly 75% four years ago to 99% last year.

Ideally, we would like to see a greater percentage of our students take all three core courses and we would be pleased if a much larger percentage took at least two of the courses at ECC. We believe that there are two major factors that lead our students to choose to move on after taking Math 110. The first is that counselors are advising against taking all three courses because of the high course unit count. The second is that, since the TEP program at ECC has been canceled, there is no structured opportunity for coordinating the scheduling of TEP courses across the campus.

Related Recommendations

Recommendation 2011A: (Consistent Units and Hours for Core Courses) We recommend revising the course outlines of record, so that Math 110, 115, and 116 are 3-unit courses with 2 hours of lecture and 2 hours of laboratory each week. For the students, this would mean a decrease in the total number of units for the three courses from 11 to 9 units. The faculty load impact of this change would be a slight increase in the faculty load for Math 110 (from 20.00% to 23.33%) and a decrease in faculty load for Math 115 and Math 116 (from 26.67% to 23.33%). This change would also improve articulation and answer the transfer concerns expressed by our counselors. We plan to propose these revisions in spring 2011. (Curriculum)

Recommendation 2011B: (Cooperation Among ECC Deans, Instructional Faculty and Counselors) We recommend increasing the cooperation among ECC Academic Deans, instructional faculty and counselors for coordination of the classes taken by future teachers to avoid conflicts in offerings. This could be accomplished with the reinstitution of the Teacher Education Program on the El Camino campus. The program administrators could keep all members of the campus community aware of current and often changing requirements for the Liberal Studies majors that intend to become elementary school teachers. As teachers in the Math Department, we are often not aware of changes at the statewide level that impact those seeking a Multiple Subject Teaching Credential. In the past the TEP program administrators were our contact in finding out the latest information. Secondly, program administrators of TEP program could be the leader in assisting all divisions to plan and schedule future teacher courses that do not have time conflicts to best serve our student population. **In the event that the TEP program is not reinstituted, cooperation among ECC Academic Deans, instructional faculty and counselors for coordination of classes must be considered to prevent the time conflicts among the courses that future teachers must complete at El Camino College.**

III. Curriculum--Course, Content, and Articulation

We are generally satisfied with its three core courses: Structures/Concepts in Mathematics (Math 110 – 3 units, 3 hours lecture), Probability and Statistics for Prospective Elementary School Teachers (Math 115 – 4 units, 4 hours lecture) and Geometry and Measurement for Prospective Elementary School Teachers (Math 116 – 4 units, 4 hours lecture). We are proud of the work we have done to align the content of the core courses with the content of the CSET exam.

At ECC – Torrance, we would like to inactivate the remaining course in our program: Probability, Statistics, and Geometry for Prospective Elementary School Teachers (Math 111 – 3 units, 3 hours lecture). This course is offered only at the Compton Education Center, and until the partnership ends or our colleagues at the Compton Education Center ask to have it removed, we will postpone the inactivation of Math 111.

We do not feel a need for any new courses at this time, and all courses have been reviewed in the last five years for compliance with Title 5 regulations, accreditation and local standards.

While the structure and content of our core courses are aligned with the curriculum at CSULB, the units and contact hours (lecture and laboratory hours) are not. Students at ECC who complete all three courses earn 11 course units; students at CSULB earn 9 course units. Our counselors are concerned that pre-service teachers at ECC are transferring with too many units. Based on these concerns, we recommend slight revisions for all three core courses (Math 110, 115, and 116), so that each course is worth 3 course units with 2 lecture hours and 2 laboratory hours each week. The fourth course (Math 111) would remain unchanged.

Related Recommendations

Recommendation 2011A: (Consistent Units and Hours for Core Courses) We recommend revising the course outlines of record, so that Math 110, 115, and 116 are 3-unit courses with 2 hours of lecture and 2 hours of laboratory each week. For the students, this would mean a decrease in the total number of units for the three courses from 11 to 9 units. The faculty load impact of this change would be a slight increase in the faculty load for Math 110 (from 20.00% to 23.33%) and a decrease in faculty load for Math 115 and Math 116 (from 26.67% to 23.33%). This change would also improve articulation and answer the transfer concerns expressed by our counselors. We plan to propose these revisions in spring 2011. (Curriculum)

IV. Student Learning Outcomes (SLOs)

The instructors in the Math for Teachers Program were among the early and most enthusiastic participants in developing and assessing student learning outcomes. Of particular note is our commitment to assessing all program student learning outcomes in all courses every semester. Even among the handful of adjunct faculty, participation has been willing and significant.

However, the ECC – Torrance instructors are concerned about the participation by CEC instructors in outcomes assessments. Math 111 is no longer taught on the Torrance campus, and so responsibility for developing and assessing the outcomes for Math 111 have been left to the CEC faculty. Currently there is only one student learning outcome listed for Math 111 and only one assessment proposal listed for that outcome. The participation by CEC instructors in Math 110 assessments has been limited, as has their participation in program-level assessments.

Math 116 is only offered once a year, and only one section. To date, the Math 116 instructor participates in the program-level and has conducted an assessment for one of the course-level outcomes. However, the plans for spring 2011 include assessments of all the course-level outcomes.

We are extremely close to achieving the Sustainable level of SLO/Assessment implementation, but given our concerns about the CEC instructors, we will have to rate ourselves at the Proficiency level of SLO/Assessment implementation.

Program Student Learning Outcomes, Assessments and Implications for Change

There are three program-level student learning outcomes that unite the Math for Teachers courses:

Program SLO #1: Students will be able to determine an appropriate strategy to solve an application problem, complete the solution of the problem, describe the procedures used to solve the problem, and explain the underlying mathematical concepts using written and oral means.

Program SLO #2: Students will be able to demonstrate and explain mathematical concepts using a variety of methods.

Program SLO #3: Students will be able to analyze a solution to a mathematics problem, determine the appropriateness of the solution, and if errors are made, explain the misconceptions or errors made and how to solve the problem correctly using written and oral means.

Every semester since spring 2008, we have assessed every program-level student learning outcome. Each instructor considers a sample of each student's work holistically, and rates each student's performance with respect to each of program-level student learning outcome, using a detailed rubric and what is essentially four-tiered scale (excellent, good, fair, or poor).

The data and statistics collected since spring 2008 indicate that students in Math 110 do not show the progress and success rate that is desired with respect to all three outcomes. In contrast, students in the subsequent courses (Math 115 and Math 116) demonstrate a significantly higher level of performance on all three outcomes. While a greater knowledge level, familiarity with conceptual based problems, and more experience in mathematics may explain part of the better performance for Math 115 and Math 116 students, we also suspect that the Math 110 students need more supervised time on task. **See Recommendation 2011A.**

Math 110 Student Learning Outcomes, Assessments, and Implications for Change

Math 110 has three student learning outcomes that are regularly assessed, using a variety of instruments. Holistic review of a portfolio of student work is the most common method, but other methods have also been explored. Each outcome and assessment utilizes a rating system identical to and a rubric similar to that used for the program-level student learning outcomes. The fulltime instructors developed each rubric in collaboration. For other assessment protocol, please see the assessment reports.

SLO #1: Students will be able to demonstrate/perform the four basic operations with real numbers and interpret the results.

Results and Implications for Change: The data suggest that our students need to work on binary operations so that more of them will achieve mastery of these routine algorithms. This group of students needs more time on task, both in class and out of class. Due to the conceptual nature of this class, deeper understanding of the material is greatly enhanced by supervised time on task. We cannot remove content from Math 110 without sacrificing topics that are extensively tested on the CSET examination, so the results of the assessments support our proposal to extend the contact hours for this course from three to four hours a week.

SLO #2: Students will be able to explain the underlying mathematical concepts of the binary operations using written and oral means.

Results and Implications for Change: The data in the holistic review of student portfolios repeatedly show that a disappointing proportion demonstrate proficiency with the concepts and skills related to this outcome when tested on quizzes and exam, and only about 75% of the students are able to do so on a comprehensive final exam. Again, the results of these assessments support our contention that these students need more time on task, particularly in a supervised setting.

SLO #3: Students will be able to solve an application problem and design an application when parameters are given.

Results and Implications for Change: Again, the data in the holistic review of student portfolios suggests that students do make steady progress increasing their proficiency with application problems, but that they would benefit from more supervised instruction.

Math 115 Student Learning Outcomes, Assessments, and Implications for Change

Math 115 has three student learning outcomes that are regularly assessed, each one linked to one or several assignments. Each outcome and assessment utilizes a rating system identical to and a rubric similar to that used for the program-level student learning outcomes. Samples of the assessment instrument are included for this course. For other assessment protocol, please see the assessment reports.

SLO #1: Students will be able to design a research study, develop an appropriate assessment instrument, collect and analyze data using appropriate methods, and/or draw statistical inferences from the data in written form.

Assessment Instrument: **STATISTICS RESEARCH STUDY** Part One: *The Design of the Research Study*; Part Two: *Data Analysis*; Part Three: *Statistical Inferences*; and Part Four: *Overall Appearance of the Research Study*

Results and Implications for Change: Over the years, the majority of the students have been able to successfully develop a research study design, collect and analyze data, and draw statistical inferences from the data to answer the research question posed. With each passing assessment, changes have been made to the directions for the project and, over time, the general quality of the statistics research project has improved. The students who did not successfully complete this project are also the students who do not meet with the instructor, despite the fact that such a meeting is listed in the specific guidelines of the project. It is essential that students meet with the instructor about their research study to ensure that the research question is sound, the research design is solid, and the project is doable in a semester timeframe. While we will continue to provide more instruction regarding choosing and implementing correct data analysis procedures, and while we will make every attempt to ensure that students meet with the instructor during the timeframe to complete this project, we are also curious to investigate the reasons why some students refuse to meet with the instructor.

SLO #2: Given a particular set of data, students will be able to determine the appropriate statistical procedures to analyze and display the data, complete the statistical methods, and explain the mathematical concepts both in written and oral forms.

Assessment Instruments: **STATISTICS RESEACH STUDY Part Two: Data Analysis and STATISTICS TEST Embedded Questions**

Results and Implications for Change: Over the years, students demonstrated a better understanding choosing appropriate analysis procedures and data analysis on the statistics research study project than on the statistics test. A better link between the type of data collected and appropriate statistical procedures may impact increased student understanding. Additional practice problems prior to an exam or project would provide students with more practice, which may lead to increased student understanding.

SLO #3: Students will be able to explain statistics and probability concepts and use appropriate methodologies for elementary or middle school students.

Assessment Instruments: **STATISTICS TEST Embedded Questions; PROBABILITY TEST Embedded Questions; GROUP TEACHING PRESENTATION; STATISTICS RESEARCH STUDY Part Three: Statistical Inferences**

Results and Implications for Change: Students continue to have difficulty choosing appropriate analysis procedures and data analysis on the statistics research study project as well as on the statistics test. The group teaching presentation was an effective strategy to promote conceptual understanding for the math topics the students selected for their group presentation. Students spend a great deal of time preparing for the group presentation and this is evident by their grades. Students have an easier time understanding and applying problems in probability and this may be due to the hands-on, inquiry-based approaches that are inherent in probability experiments. There are four suggestions that can be implemented to increase student success: (1) Provide data and ask students to determine an appropriate data analysis strategy, (2) ask students to draw inferences from data they analyzed, (3) pose questions which reveal conceptual understanding of probability, and (4) discuss conceptual nature of probability and statistics during class instruction.

SLO #4: Students will be able to solve, explain, and interpret informal, experimental and mathematical probability concepts and application problems both in written and oral forms.

Assessment Instruments: **PROBABILITY TEST Embedded Questions; GROUP TEACHING PRESENTATION**

Results and Implications for Change: Students find that understanding the concepts in probability are much easier than those of statistics. Performance on exams and activities are typically in the 90% success rate.

Math 116 Student Learning Outcomes, Assessments, and Implications for Change

Math 116 has four student learning outcomes; only the fourth has been assessed to date. Math 116 is only offered once a year. Plans for spring 2011 include assessing all of the student learning outcomes. Each outcome and assessment will utilize a rubric similar to that used for the program-level student learning outcomes. Below are the four student learning outcome statements. We include the details of the assessment conducted for the fourth one.

SLO #1: Students will identify two- and three-dimensional geometric shapes, explain their attributes and discuss the relationships among the geometric shapes.

SLO #2: Students will use geometric tools (compass, protractor, straightedge, and dynamic geometry software) to construct geometric figures.

SLO #3: Students will use the concepts of measurement to solve geometric application problems.

SLO #4: Students will use words and diagrams to explain the derivation of the area formulas.

Assessment Instrument: Given an area formula, students will use words and diagrams to explain the derivation of the area formula.

Assessment Rubric: Explanations of formulas are correct: 3 points per explanation (total: 15 pts)

Example problems are completed correctly: 2 points per problem (total: 10 pts)

Creativity & Neatness: 5 points total

Total for Project: 30 points

Results and Implications for Change: Student success on this assessment is high, typically in the 90% range. Asking students to complete a verbal explanation along with the writing assessment is a suggestion for improvement.

Math 111 Student Learning Outcomes, Assessments, and Implications for Change

Math 111 is no longer offered at ECC – Torrance; once the partnership ends, this course will be inactivated (possibly even sooner if the ECC – CEC instructors agree). The development of student learning outcomes and assessments has been placed in the hands of the instructors at the CEC. To date, Math 111 has only one student learning outcome. There is a plan filed to assess this outcome in fall 2010, but no final report has been submitted.

Related Recommendations

Recommendation 2011C: (SLOs with CEC Faculty) We recommend continuing to assess the SLOs at both the course and program level at ECC. We should continue to work with the CEC faculty in completing an entire assessment cycle for the classes in this program. (SLO)

V. Facilities, Equipment, and Technology List

The Math for Teachers Program currently tries to offer all of the courses in MBBM 114. This classroom has tables, a cabinet in the back of the classroom, and a computer projection system that allows for teacher demonstrations when necessary. The tables provide ample space for the students in this program to use manipulatives in class and the cabinet allows for storage of these materials. The computer projection system allows the teacher to do class demonstrations also. Without the features available in MBBM 114, our core courses cannot be taught as designed. Unfortunately, when one of our courses has been moved to a different classroom, the quality of the classroom experience for students has decreased noticeably. In both Spring 2010 and Fall 2008, the Dean moved Math 116 out of MBBM 114 to classrooms that were not equipped with tables, a cabinet, or a computer projection system.

All teachers in the program also use their computers (email) as the dominant way to communicate with students in their classes and in some cases, assignments are turned in via email. Often, teachers will also prepare some portion of a lesson on their computer and use it within the classroom.

Currently in the Math 115 course, students are required to use the program, Minitab, to tabulate and analyze data for the research project that students are required to complete. Students will also use calculators as a way to tabulate data. However, with the upgrade of laboratory computers currently underway, the version of Minitab we currently have will no longer work. We do not know whether the college plans to upgrade Minitab at this time, which may have a negative impact on Math 115. A sustainable plan for periodically upgrading Minitab would be highly desirable in the long term.

Currently, in the Math 116 course, there are approximately 3 – 5 labs that are completed using the program called Geometer's Sketchpad (per the course outline). This program is installed on the computers in the lab in the basement of the MCS Building and in the library. When students complete labs during classtime, they go as a class to the lab in the basement and if there are labs that are not completed, or are to be done as homework assignments, students will use the lab in the library to complete the assignment. However, as with Minitab, the future availability of Geometer's Sketchpad for our students is in question and a long-range, sustainable plan for periodically upgrading Geometer's Sketchpad is needed.

With the anticipated move to the new building, the Mathematics for Teachers Program needs a dedicated classroom with adequate storage space, movable tables, and appropriate technology to allow the future teachers to fully participate in the courses as they are designed. Our program will request a room in which all of our courses can be taught. It is crucial that this classroom be equipped with a computer projection system, tables for student use, and some sort of locking cabinet to allow for storage of necessary class materials.

Related Recommendations

Recommendation 2011D: (Dedicated Classroom) We recommend a classroom dedicated to the Math for Teachers Program in the new building. The classroom should be equipped with tables, a locking storage cabinet, and a computer projection system. This classroom may be used for other math classes during the day but the Math for Teachers courses should be given top priority for this classroom. It is also imperative that our

classes do not get moved out of the classroom to accommodate other classes which would have a negative impact on the students in our program. (Facilities)

Recommendation 2011E: (Current Software) We recommend designing a long-range, sustainable plan to purchase and use the most up-to-date version of the software used in the courses in this program. In anticipation of the workplace our future teachers will enter, we are doing our students a disservice to teach our classes using outdated software. (Technology)

VI. Staffing

Current Staffing

Currently, there are three fulltime instructors (Judy Kasabian, Eduardo Morales, and Susie Tummers Stocum) who consistently teach our core courses, although other fulltime instructors have taught the curriculum in the past, and occasionally an adjunct will teach Math 110. When an adjunct instructor teaches a Math 110 section, the fulltime teachers in our program willingly mentor the part-time instructor, encouraging dialogue and sharing teaching materials. As a result of the dedicated fulltime instructors in the program, as well as the strong mentoring, monitoring, and support offered adjunct instructors; students enjoy a very consistent, high quality experience in our core courses.

Program's Current and Future Needs

Our current staffing is adequate for our program at its present level of offerings. Should the proposed changes to the core courses result in a return to more robust enrollments, we would need to attract two additional fulltime math instructors to teach in the program regularly, and there may be a need to formalize the support structures we currently offer adjunct instructors.

Related Recommendations

Recommendation 2011F: (Possible Increase in Faculty) In the event that our proposed changes to our curriculum are approved, we recommend attracting two additional full-time math instructors to teach in the program and creating a more formal support system for the adjunct instructors that may teach in the program. (Staffing)

VII. Planning

Internal & External Changes or Trends Impacting Program

Internally, we see three changes that will have an impact on our program. The possibility of a change in the number of units in our program could lead to more students taking all three of the math courses in the program. Secondly, our movement to the new building and having a true dedicated classroom for our program should

allow for access to both the necessary technology and the needed classroom space for the manipulatives that are used in these classes. Lastly, school-wide schedule coordination will impact our program. Students that are Liberal Studies majors should be able to create class schedules that do not have classes at conflicting times. A coordinated effort among all divisions involved must be made so that students can take the necessary classes for transfer and not be delayed in transferring due to the school-wide schedule conflicts.

A major external factor that is impacting our program is the current budget crisis in the state of California. K-12 education and specifically some of our local districts have seen massive budget cuts, often resulting in teacher lay-offs. Given that the economic situation does not seem to be headed for any drastic improvements in the next five years, we may see our program remain consistent or possibly even have a slight decrease in enrollment in the upcoming years. Secondly, we must always stay abreast of changes within the Liberal Studies programs at different universities and the California Credential program. With the assistance of the counselors, teachers in the program will make every attempt at remaining informed about changes that may impact our program. Lastly, we are facing the morale problem that is evident in many facets of our media these days. Teachers are often at the forefront of the criticisms of our school systems. Our future teachers are often faced with questions of “Why would you want to be a teacher?” and lack of family support for their chosen profession.

Direction of program

Regardless of the potential factors working against our program, it is our hope that our program will grow in the next several years. Training future teachers that understand math both procedurally and conceptually is an essential factor to improving their ability to teach math in a meaningful way. We intend to stay cognizant of changes at the transfer institutions as well as the state level and be well positioned to respond as necessary to changes that will occur within our program from either internal or external factors.

Goals

The goals and objectives of the Math for Teachers Program fall in line with those of the college. We intend to offer a quality program that will ensure the success of our students both at their transfer institution and as teachers in a classroom. We have and will continue to support student success by using a variety of teaching methodologies within our classes. Student learning outcomes will continue to be assessed and close communication by those within the program will allow for any changes necessary to continue to support student success and the vitality of our program. The Math for Teachers Program must be granted the dedicated classroom and updated software to be able to continue to prepare our future teachers for the technological advances they will experience within their own classrooms.

VIII. Conclusion and Summary

Prioritized Recommendations

#1 - Recommendation 2011A: (Consistent Units and Hours for Core Courses) We recommend revising the course outlines of record, so that Math 110, 115, and 116 are 3-unit courses with 2 hours of lecture and 2 hours

of laboratory each week. For the students, this would mean a decrease in the total number of units for the three courses from 11 to 9 units. The faculty load impact of this change would be a slight increase in the faculty load for Math 110 (from 20.00% to 23.33%) and a decrease in faculty load for Math 115 and Math 116 (from 26.67% to 23.33%). This change would also improve articulation and answer the transfer concerns expressed by our counselors. We plan to propose these revisions in spring 2011. (Curriculum)

Fiscal Impact of this Recommendation: Although there are some load changes that will occur if the proposed changes occur, we do not anticipate a fiscal impact. When considering the schedules of the full-time faculty, the spread in a full time assignment should allow for these load changes and have no fiscal impact. In the event that a part-time instructor teaches a Math 110 course there will be a 3% increase in load. However, given the current budget situation, we do not anticipate a part-timer teaching this course in the near future.

#2 - Recommendation 2011D: (Dedicated Classroom) We recommend a classroom dedicated to the Math for Teachers Program in the new building. The classroom should be equipped with tables, a locking storage cabinet, and a computer projection system. This classroom may be used for other math classes during the day but the Math for Teachers courses should be given top priority for this classroom. It is also imperative that our classes do not get moved out of the classroom to accommodate other classes, which would have a negative impact on the students in our program. (Facilities)

Fiscal Impact of this Recommendation: Due to our anticipated move to the new building, we should be able to designate a room that can be used for our program. The classroom projection system will be in the new classrooms. The fiscal impact may be within in the furniture budget for the new building to assure that we have tables and a locking storage cabinet. Currently, we have a locking storage cabinet in MBBM 114, so if there is no budget for a cabinet, we can move the cabinet we currently use.

#3 - Recommendation 2011E: (Current Software) We recommend designing a long-range, sustainable plan to purchase and use the most up-to-date version of the software used in the courses in this program. In anticipation of the workplace our future teachers will enter, we are doing our students a disservice to teach our classes using outdated software. (Technology)

Fiscal Impact of this Recommendation: We anticipate that we will need about \$5000 every 3 to 4 years to keep our software current. We need to be sure that there is a lab that is accessible during class time and outside of class time that students can access with the most up-to-date version of the software necessary for our courses.

#4 - Recommendation 2011C: (SLOs with CEC Faculty) & Recommendation 2011F: (Possible Increase in Faculty) The committee feels that these two recommendations can be worked on simultaneously. Members of the committee would like to work with interested faculty to develop expertise in teaching these classes. We recommend continuing to assess the SLOs at both the course and program level at ECC. We should continue to work with the CEC faculty in completing an entire assessment cycle for the classes in this program. (SLO). In the event that our proposed changes to our curriculum are approved, we recommend attracting two additional full-time math instructors to teach in the program and creating a more formal support system for the adjunct instructors that may teach in the program. (Staffing)

Fiscal Impact of this Recommendation: There should be no fiscal impact from this recommendation. We need to work with the faculty we have at both the ECC and CEC campuses to attract members of our departments that maybe interested in teaching these courses. Upon the expression of interest from our colleagues, members of our committee will mentor and support those individuals so as to continue offering a high quality, consistent program to our students.

#5 - Recommendation 2011B: (Cooperation Among ECC Deans, Instructional Faculty and Counselors)

We recommend increasing the cooperation among ECC Academic Deans, instructional faculty and counselors for coordination of the classes taken by future teachers to avoid conflicts in offerings. This could be accomplished with the reinstitution of the Teacher Education Program on the El Camino campus. The program administrators could keep all members of the campus community aware of current and often changing requirements for the Liberal Studies majors that intend to become elementary school teachers. As teachers in the Math Department, we are often not aware of changes at the statewide level that impact those seeking a Multiple Subject Teaching Credential. In the past, the TEP program administrators were our contact in finding out the latest information. Secondly, program administrators of TEP program could be the leader in assisting all divisions to plan and schedule future teacher courses that do not have time conflicts to best serve our student population. **In the event that the TEP program is not reinstituted, cooperation among ECC Academic Deans, instructional faculty and counselors for coordination of classes must be considered to prevent the time conflicts among the courses that future teachers must complete at El Camino College.**

Fiscal Impact of this Recommendation: The fiscal impact of this recommendation is dependent upon the reinstitution of the TEP program. If the TEP program is not reinstituted, there should be no fiscal impact.