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Page 1: I. Program Overview and Update

Q1 Department(s) Reviewed:

Mathematics

Q2 Lead Author and Participants: Please list any person who participated in the preparation of this report.

Dan Curtis, Tammi Marshall, Annalinda Arroyo, Scott Eckert, Bryan Elliott, Chris Navo, Terrie Nichols, Rachel Polakoski, Lamia Raffo

Q3 Dean/Manager:

Pam Kersey

Q4 Program Update: Please summarize the changes, additions, and achievements that have occurred in your program since your last program review was submitted. To access your 2019 program review, visit the Program Review webpage.

- We filled a full-time math position made vacant by a recent retirement.
- To significantly increase the rates at which all incoming students access transfer-level math courses, we successfully collaborated with the Grossmont College Math Department to change the District's placement policy. Cuyamaca College is now fully compliant with AB 705.
- We successfully collaborated with the Grossmont College Math Department to align our support courses.
- The Chair of the Math Department worked with a small team (Counselor Supervisor at Grossmont; IT representative & programmer) to develop the in-house assessment questionnaire. This included working with English, ESL, Counseling, A&R, Financial Aid, Assessment Office, Curriculum, other disciplines across colleges affected to ensure this new process worked to make the assessment process easier and did not disrupt any needed services.
- Cuyamaca College was a finalists for the Excelencia in Education award for dramatically increasing Latinx success rates by eliminating the structural inequities of built into the traditional basic skills pipelines of doom in English, math, and ESL.
- Due to the impressive growth rate in the science and engineering programs and their new full-time faculty positions (which we fully support), the number of office spaces available for future math faculty in the H-building is now zero.
- One full-time math faculty continued to work at 30% load for the California Acceleration Project (CAP) to lead the way as colleges throughout the state struggle to comply with AB 705. The Math Department and the District are fully compliant with AB 705.
- In spring 2019, 14 math faculty (8 part-time and 6 full-time) attended the annual CAP Acceleration across California conference.
- We continued to evaluate and revise as needed our corequisite support models in: Intermediate Algebra, Statistics, Business Calculus, and PreCalculus.
- We continued our collaboration with Tutoring to prepare additional tutors on to work with students enrolled in classes where teaching and learning occurs in the student-centered classroom.
- We pooled the full-time and part-time "Student Hours" for Math 160 to increase student-teacher one-on-one instruction outside of class through more open hours in the STEM Center. In addition, we worked with Tutoring to ensure the Workshops did not overlap with these hours giving the students more options to get help when needed.
- We continued to expand the textbook selection to include more zero or low-cost options for students.
- A few years ago, we were granted permission to convert the Open Learning Initiative (OLI) statistics course to Canvas and edit the course at will. Last year, we completed the task (including major revisions to the content) so that students at Cuyamaca College and many other colleges throughout the state now benefit from using our OLI on Canvas course (a zero-cost online interactive textbook) in lieu of a traditional statistics textbook. Additionally, we developed a supporting 241-page student workbook with guided lesson plans for instructors.
- We collaborated with the Psychology Department to begin offering a PSY 215+Math 060 course combination in fall 2019.
- We began offering more Math 160 online courses with staggered start dates to meet demand and changed the delivery format to the OLI on Canvas course.
- We tried a Math 180 and Math 280 combination in spring 2019. While 15 students were able to get through the two courses in one semester, we realized most students need a full semester of Math 180 and it would be better to offer Math 280 and Math 281 in one semester. We will pilot this model in spring 2020. The purpose in this pilot is to accelerate student access to physics and engineering classes with math prerequisites.
- In summer 2018, three math faculty participated in CUE (Center for Urban Education) Equity-minded Teaching Institute at USC along with the Dean of Math, Science, and Engineering and several other faculty from across the campus.
- The Math Department participated in the College Equity-minded training program. There were 16 regular math faculty participants in fall 2018 (half of which were part-time faculty) and 6 math faculty participants in spring 2019 (five of which were part-time faculty).
- We accelerated our original acceleration model. By eliminating the one-semester preparatory course leading to Statistics (Math 096), students who previously were placed into the two-course sequence (Math 096 followed by transfer-level Statistics, Math 160) now enroll directly into Math 160 with corequisite course (one and done!).

Q5 1. Do you have a course Student Learning Outcome (SLO) assessment plan on file with the Student Learning Outcome and Assessment Committee (SLOAC)? If you have not already done so, you can submit your program's assessment plan to SLO Coordinator, Tania Jabour, at tania.jabour@gcccd.edu. **Yes**

Q6 OPTIONAL: You may upload a copy of your SLO assessment plan for SLOAC here. If you have an Excel sheet, please convert to one of the supported files listed below before submission. **Respondent skipped this question**

Q7 2. Please provide an analysis of your Student Learning Outcomes (SLO) findings and what changes, if any, were made as a result.

The Math Department continues to assess student learning outcomes and analyze the results on a regular basis. The data assists Department members in making evidence-based decisions to improve our courses, pedagogical practices, and program. As stated in last year's Annual Report, we recognize that a high-stakes final exam does inform our understanding of students' overall skill and concept attainment. Therefore, we continue to assess most SLOs over the course of a semester instead (sometimes multiple times to give the students an opportunity to grow and learn). This provides math faculty with a more holistic understanding of how and what the students are learning.

Many of our SLO assessments show positive results. Overall when we do not get the results we would like from the assessments it is due to contextual learning (aka word problems). We need to continue to work on this to make connections with the material in our courses to other courses and the students' lives which is something we are continuing to work on. The Community of Practice (COP) groups are helping tremendously with several of our classes in this area as they discuss lessons and student learning. While we do not have a COP for all courses, the instructors in these other courses work together to ensure students are learning the material and make changes in lessons where needed. However, the department needs to work on getting together and have a true robust conversation about the results of SLO assessments and using these results to help us make changes in the classroom.

After analyzing our SLO assessments, we realized our SLOs in general needed to be updated as they were still too much like Course Objectives. Therefore, we underwent an overhaul of rewriting all our SLOs to be broader and really encompass the knowledge and understanding of the material students should have upon being successful in the course. Most courses were updated in spring 2019 with a few updated in fall 2019.

When looking at our SLO assessment plan, we decided since we are doing a comprehensive Program Review in 2020-2021, we will not assess any of our courses that academic year. Instead, we will take a look at assessments over the last few years to ensure we have a good handle on how our students are doing in class. From this, we will see what changes, if any, need to be made to the classroom experience or our assessment process. This will also give us an opportunity to start fresh assessing all of our updated SLOs.

Lastly, the department uses course retention & success rates; longitudinal success rates; and throughput rates to get a better picture of the overall achievement of our students. This includes looking at inter- and intra-disciplinary course sequences that begin with a math course. For example, we looked at the PreCalculus to Calculus I sequence and saw for students who took PreCalculus as a first math course and were successful AND then enrolled in Calculus I, 73% of them were successful in their first attempt. We then disaggregated this data and saw a success rate of 59% for students who took PreCalculus with support versus a success rate of 77% for students who took PreCalculus. While students who took PreCalculus by itself had higher success rates, we know most of the students who took PreCalculus with support would have previously been placed in many layers of developmental education and never have made it that far. However, it is still something the department is looking to address and improve upon.

Another example is looking at the success rates of students who went from Math 096 (Foundations for Statistics and Quantitative Reasoning) or Math 160+060 (Statistics with support) to CHEM 102 versus Math 090 (Elementary Algebra) to CHEM 102. It was found that students who went through the Statistics route had a better success rate than those that went through Elementary Algebra (54% versus 46%). As a result the prerequisite for CHEM 102 has now been changed to Math 096, Math 060, or equivalent.

Q8 3. Does your department or discipline offer any degrees and/or certificates? **Yes**

Q9 4. How are you currently assessing your PLOs?

We currently assess our PLOs through the mapping of our course SLOs. There are a few faculty who do long-term projects in the classes that are at the end of the math sequence and we assess the PLOs through these as well. While, we have assessed these regularly, the results have not been entered into TracDat regularly and the department has not spent much time discussing these assessments. This is something the department plans to spend a little more time on in 2020-2021 to really look at how our students are doing overall.

In addition, we are having conversations with other departments about the creation of STEM PLOs that would help us better oversee the STEM Academic & Career Pathway. While we are uncertain where this will lead, since we share students and our courses overlap, it is important to continue these conversations.

Q10 5. Are your PLOs in the catalog an accurate reflection of the department or discipline's current learning objectives? To access the College Catalog Associate Degree Programs and Certificates section, click here. **Yes**

Q11 6. Are the PLOs mapped onto the course SLOs? If you require assistance, please contact Madison Harding in the IESE Office at madison.harding@gcccd.edu **Yes**

Page 4: II. Assessment and Student Achievement

Q12 Referencing the last 5 years of data, discuss the changes in course success rate since the last program review (annual or comprehensive) report.

Over the past several years, the course success rates have held steady at around 67%, though we did see an increase to 69% in fall 2018 and 70% in spring 2019. These increases have primarily been driven by increases in the success rates in Math 160, which had year-to-year increases of 4 percentage points in fall 2018 and 8 percentage points in spring 2019, even with more lenient placement policies. These increases can be attributed to the addition of co-requisite support courses, as well as extensive professional development and instructor training as part of our Community of Practice.

In addition, comparing those students who placed into transfer-level math courses and those students who traditionally would have placed into basic skills math courses, data indicates that both groups of students who take subsequent math courses or courses in other disciplines have similar success rates.

Q13 Considering the college's 2024 goal of increasing course success rates to 77%, discuss how your department/discipline will help meet that goal.

Although the Math Department does not focus on course success rates by itself, we do focus on the things that support this such as student learning and pedagogical changes. Our focus is to improve student learning and educational goal attainment and, as a consequence, we expect course success rates to continue improving.

Q14 Please describe any equity gaps, in which specific groups (e.g., by gender and ethnicity) have success rates lower than that of the department or discipline overall.

Overall success and retention rates are comparable between genders, with female students performing slightly better than male students. We do see an equity gap in overall success (all math courses) for African-American and Latinx students, however, with African-American student success rates 14 percentage points below White students and Latinx students 9 percentage points below for spring 2019. These gaps have closed considerably over the last 5 years as African-American student success rates improved from 53% to 60% and Latinx students from 54% to 65%, while White students have held steady over this time frame.

Also, it should be noted that the one-term throughput rate for first-time math students who enrolled in a transfer-level course in fall 2018 has closed the equity gap for Latinx students and reduced it for African American students. In fall 2018, 59% of Latinx students and 46% of African American students were successful compared with 57% of White students (2019, What Happens When Colleges Broaden Access).

Q15 What department/discipline (or institutional) factors may be contributing to these lower success rates for these groups of students?

There are several factors that may be contributing to lower success rates:

- It often takes well into the semester for students to receive their financial aid award which leads to students working in the course with no textbook or other required materials
 - The low number of tutors during the day and lack of evening tutoring
 - Instructors may harbor hidden biases
 - Lack of diversity in staffing and tutors
 - Lack of open communication about cultural differences
 - Students encounter hardships that hinder success or force them to drop
-

Q16 What specific steps will the department of discipline take to address these equity gaps in the 2020/21 academic year?

In order to tackle hidden biases and lack of open communication about cultural differences, during the 2018/2019 academic year, 16 members of the Math Department, part-time as well as full-time, participated in the twice-monthly Equity-Minded Training workshops and Equity-Minded syllabus workshops. We also had 14 members of our department attend the Acceleration Across California conference which has a strong focus on equity. This year and continuing into the next academic year, we have been working together to make changes and develop strategies based off what we learned that are designed to address the equity gaps and can be incorporated into our classrooms. A few examples are focusing on making the syllabus more equity and student-centered; changing faculty mindsets about students; incorporating a more student-centered learning environment in the classroom. We will continue to encourage faculty to attend the EMTLI activities and other professional development that focuses on equity.

To help alleviate financial issues our goal is to make all of our courses no to low-cost textbooks and keep course costs low overall. We have developed many of the materials for our support courses, which makes it so we can offer the materials either free to our students or at cost for printing purposes only through the bookstore. In addition, we are using OER textbooks or reduced cost textbooks for several of our classes. For our other courses, we are expanding our free and reduced cost textbook program as part of our ongoing efforts to reduce overall course costs. In addition, we are working with the college to incorporate the purchasing of any needed textbooks at the time of registration through Self-Serve. This will make it so that students have access to these materials on day one, hence increasing success rates.

Through the implementation of the corequisite support model and the elimination of the math pipeline of doom, the Math Department has minimized the structural barriers to success and made math curriculum more relevant. The remaining barriers to student success that we intend to address are: 1) changing mindsets (faculty, classified, administrators, and students); 2) student hardships (working with Cuyamaca Cares, UP!, DSPP, EOPS, etc.); 3) the availability of college-wide human resources (faculty, staff, tutors) to prepare faculty for teaching and learning in the student-centered classroom; 4) lack of instructional staff (faculty and tutors) that reflect the cultural diversity of our student body.

Q17 How do these steps inform the long-term department or discipline goals that you are setting in this annual program review?

These steps go hand-in-hand with our long-term department goals. The Math Pathways program is designed to improve overall completion rates. Intentionally targeting achievement gaps with the steps listed above are one of the primary focuses of how we intend to assess, revise, and continue to improve the Math Pathways program. Also, these same steps will contribute to student success across all academic and career pathways.

Q18 In what way does your department/discipline work across instruction and student services to advance the college's student success & equity goals?

The math department has worked with other departments to tailor the math courses to better support students in other disciplines. We paired a MATH 060 support course with PSYC 215 so all psychology students would be eligible to take their statistics course without going through algebra. When developing our support courses, we spoke with other departments that had classes with prerequisites of math courses that we no longer offer to ensure that the necessary material was included to be able to make the support courses prerequisites instead.

Annalinda Arroyo is working with the UMOJA program at Grossmont to improve support for black and African American students by intentionally intervening when we recognize a student is struggling. Moving forward we would like to work with a robust UMOJA program at Cuyamaca. In addition, Annalinda is working with Moriah Gonzalez-Meeks to make our statistics class more equity-minded (by linking a Math 160 with a Chicano Studies class).

In spring 2021, Dan Curtis is planning a sabbatical, along with Miriam Simpson in the physics department to create online supplemental instruction materials directly aimed at helping math, physics, and engineering students. The hope is a closer working relationship with these departments will help incorporating more contextualized material in our math courses as well as make the material more culturally relevant.

In addition, Terrie Nichols is planning for a sabbatical in spring 2021 to work on updating the material for MATH 160 (Elementary Statistics) more current and culturally relevant. Since we have the most sections of this course and many non-STEM students take this course to meet the graduation and/or transfer requirements, this project is imperative in helping reduce equity gaps.

Q19 OPTIONAL: If you would like to attach any charts or additional documentation (aside from the program review report prepared by the IESE Office), please upload it using the button below.

Respondent skipped this question

Page 5: II. Assessment and Student Achievement

Q20 Do you offer distance education (online) courses?

Yes

Page 6: II. Assessment and Student Achievement

Q21 Are there differences in success rates for distance education (online) versus in-person sections?

Respondent skipped this question

Q22 If there are differences in success rates for distance education (online) versus in-person sections, what will the discipline or department do to address these disparities?

We are seeing a 13-percentage point gap in success rates between online students and in-person students, though we have seen a slight improvement over the last 5 years. To help close this gap, our online MATH 160 courses (our only online course) have switched to online instructional materials in Canvas that we have developed and have been using in our MATH 160 with concurrent support. These materials provide students with a more conceptual understanding of the material and helps students stay more focused and on task with the material. It is our hope that this will help close the gap between on-line and in-person success and retention rates.

In addition, the department is refocusing some of our efforts on retention in our online classes (as well as face-to-face). If we are able to help more students stay up to date with the material, this should lead to an increase in retention which should ultimately lead to an increase in success rates.

Another idea includes offering more 12-week options and less 8-week options as the fast pace of the course tends to hinder student success and not give students an opportunity to catch up if they are behind. Staggering the start dates of these online sections would also give faculty an opportunity to save students who want/need to 'start over' with another section.

Q23 What mechanisms are in place to ensure regular and effective contact within online courses across the discipline or department?

Regular and effective contact hours are ensured by following the Cuyamaca College distant education policies that are currently in place. Some examples that are utilized by the math faculty include, but are not limited to:

- Instructions for where to head for an online orientation in our course announcements.
- An online orientation module which includes an affective domain exercise within each Canvas course shell.
- Clear instructions in our syllabi stating each instructor's policy for communicating with students (canvas messaging, email, and Remind app are currently being used) and the timeframe students can expect for a response.
- The online course materials utilize group discussion board assignments which provide each instructor the opportunity to provide graded feedback individually to each student as well as the opportunity to "jump in" to each group's discussion board to provide encouragement/feedback while the project is progressing.
- During the first week of class provide a syllabus quiz at the end of orientation allowing faculty to identify students who are not participating and contact them to inquire as to their desire to remain in the course.
- While the course is ongoing utilize multiple messaging options to contact students if they are identified as struggling to keep up with the assignments as well as to offer encouragement for keeping up with the course materials. An example of a messaging option is the gradebook messaging feature in Canvas where you can message students who have not turned something in or received a low score.

Page 7: III. Previous Goals: Update (If Applicable)

Q24 Would you like to provide an update for your previous program review goal(s)? **Yes**

Page 8: III. Previous Goals: Update (If Applicable) continued

Q25 Previous Goal 1:

Assess, revise as needed, and continue to improve the Math Pathways program (previously stated as "Revising and improving the Math Pathways program")

Q26 Which College Strategic Goal does this department goal most directly support?

Basic Skills Acceleration

Q27 Please describe how this goal advances the college strategic goal identified above.

Students in all math pathways (STEM, Liberal Arts, CTE, Business, and Education) benefit from acceleration. We developed the Math Pathways program based on the three high-leverage strategies: Accelerate Remediation, Concurrent-enrollment Support Courses, and change placement policies to allow more students to enroll directly in transfer-level math courses. Simply stated, the goal of Math Pathways is to eliminate the equity gap and increase student completion rates of transferable math courses. By implementing the three high-leverage strategies, Math Pathways provides all students, and, in particular, disproportionately affected students, with an achievable pathway to earning a degree or certificate or transferring to a four-year university.

The Math Pathways program is specifically designed to support the department's vision, namely to plug holes in the leaky pipeline and to close the equity gap. By shortening the pre-transfer pipeline, we give students fewer opportunities to fall out and allow them to complete their math requirements in a timelier manner. Also, with our previous placement policies, disproportionately impacted students were much more likely to find themselves in pre-transfer math classes. By revamping the placement policies, we have closed the equity gap regarding access to a transfer-level math course. This, in turn, means an increase in throughput rates and the annihilation of the equity gap. The program has been such an overwhelming success that we have shortened the pipeline far more than we anticipated we would be able to. We no longer offer Math 96 (our initial accelerated course) because the data clearly showed that students who went directly into Math 160 with support (an open access course) had much higher completion rates with fewer units required.

The number of students enrolling in Math 110 (our only pre-transfer-level course) has also decreased significantly, instead enrolling in higher-level courses, and as a result we have decreased these offerings. Additionally, we have expanded the breadth of the Math Pathways program by working with other disciplines. For example, psychology and social sciences majors need to take PSY 215 (Statistics in Behavioral Sciences) instead of Math 160 (Elementary Statistics). Because of this, students that placed at a level below PSY 215 had to take Math 160 or Math 160+060 and then PSY 215, forcing them to take an unnecessary class and waste a semester. To remedy this, we worked with the Psychology Department to offer a Math 060 support course linked with PSY 215. We are now working with the Political Science Department to do something similar.

A few years ago we were granted permission to convert the Open Learning Initiative (OLI) statistics course to Canvas and edit the course at will. Last year, we completed the task (including major revisions to the content) so that students at Cuyamaca College and many other colleges throughout the state now benefit from using our OLI on Canvas course (a zero-cost online interactive textbook) in lieu of a traditional statistics textbook. Additionally, we developed a supporting 241-page student workbook with guided lesson plans for instructors. The OLI on Canvas course and classroom workbook were developed by Cuyamaca math faculty and intentionally designed for use in the student-centered classroom. In this learning model, the focus of activity shifts from the teacher to the learner. Class time is spent on discussion, collaborative work, and engagement with the brains-on activities from the workbook.

These learning materials (developed by Cuyamaca's math faculty) allow instructors to tailor teaching and learning to fit the needs of small groups of students as they work through the activities and review prerequisite skills in a just-in-time approach. Furthermore, this learning model employs a teacher-guided-discovery process that allows instructors to identify gaps in student understanding and use class time to remediate those gaps. The student-centered classroom and the activities in the workbook prepare students for the reading and homework they will do in the OLI on Canvas course outside of class. These are atypical teaching and learning materials for math teachers, and the student-centered classroom is an atypical learning environment for math teachers. However, these atypical tools contribute to the dramatic increase in student success and throughput rates in math, so we continually endeavor to resist our pre-reform expectations for teaching and learning in the math classroom and strive to evolve in the practice of our craft.

This year, the department is working on doing the same work for the Math 060 materials. Revisions and changes will continue into next year.

With the implementation of the Math Pathways program more students studying Business or STEM (BSTEM) are placed into a transfer-level math course. With the inclusion of a new question on the assessment questionnaire that identifies the student's program of study, only math classes that support attainment of the student's educational goals are recommended to the student. As a result of this work, only students who are interested in a STEM major but never completed Algebra 2 in high school are advised to enroll in Math 110, Intermediate Algebra (one level below transfer). The department anticipates this will decrease the need for Math 110 to one or two sections as more students are appropriately placed in the transferable math course(s) they need.

Instructional Program Review Annual Update - Spring 2020

sections as more students are appropriately placed in the transferable math course(s) they need.

Because more students are placing into Math 176 (PreCalculus) and Math 178 (Business Calculus) with or without support, the first BSTEM math courses, the department is working on updating the materials for these courses. The activities and lesson plans were developed when we initially implement the Math Pathways program. We have learned much and more from the pedagogical changes we made to these courses as well as the textbooks we used. Consequently, we must completely revise the classroom instructional materials (group work) and instructor lesson plans. Department members will begin this work in spring 2020 and will likely complete the work by the end of the 2020-2021 academic year. This work will include looking closely at the material taught in Math 176 to ensure we are preparing students for success in the calculus sequence. As part of this work, Chris Navo plans to work with the Business Department to ensure the material taught in Math 178 is adequately preparing students studying Business for the other courses they need to take.

Q28 Goal Status

In Progress - will carry this goal forward into next year

Page 9: III. Previous Goals: Update (If Applicable) continued

Q29 Please describe the results or explain the reason for deletion/completion of the goal: **Respondent skipped this question**

Q30 Do you have another goal to update?

Respondent skipped this question

Page 10: III. Previous Goals: Update (If Applicable) continued

Q31 Please describe action steps for the year:

Revising and improving the Math Pathways program is an ongoing process that will keep us busy for many years. With the requirements of AB 705 and our push to move non-BSTEM majors into Statistics or Quantitative Reasoning. We expect the demand for Math 110+010 and Math 110 to diminish.

Since the majority of our courses are taught by part-time instructors, the Community of Practice (COP) and Teacher Mentoring programs we have developed have been essential to the success of the Math Pathways program. As part of these programs, we regularly meet to discuss best teaching practices, such as just-in-time remediation, the student-centered classrooms, student engagement, productive struggle, and faculty mindset. We are continually in the process of developing new instructional materials, classroom activities and assessments, and online assignments in the support of these practices. With sufficient support, we are empowered to continue to assess, revise as needed, and offer these essential training programs.

The Math Department collaborates with Tutoring to train tutors so they can better help students in the Math Pathways program. Due to the innovative teaching methodology, tutors need specialized training for students in these classes. In spring 2020, we received funding for three tutors to participate in a teacher job-shadow program to learn what the students are learning, how the material is, and brush up on some of the more challenging topics. We plan to continue and hopefully expand this practice to include the calculus sequence, provided tutoring has the funding available to continue with the training.

In addition, the tutoring budget cuts continue to negatively impact the Math Pathways program. Students need to be able to get help and it needs to be made available at many hours during the week. We would like to see additional tutors during the day as well as have tutoring open until 8:00 pm four nights of the week (instead of just two nights). But this takes money, and tutoring often finds itself relying on soft money rather than having enough in the general fund. We would like to see the college increase the general funds given to Tutoring.

The Math Department will continue to work with the Counseling Department and other campus-wide constituents to educate new Counselors and students about the Math Pathways program. The goal of the marketing campaign is not only to make sure students know which class is right for them based on their studies, but also to align their expectations with how these new courses are going to be taught. Being that Cuyamaca's program is very different than others around San Diego County, it is imperative we work with Counseling to ensure the part-time Counselors are up-to-date with everything here at Cuyamaca.

Q32 How will this goal be evaluated?

For fall 2019, we, again, increased access to Math 160 and Math 120 and began telling students exactly what math course(s) they need to take based on what they were studying. As a result, we need to evaluate the effects this has had on enrollments in math courses, including the percent of first-time students who take and complete math. The department will continue to monitor the throughput rates of students disaggregated to ensure we are closing all equity gaps. Lastly, the department is hoping to have completed some focus groups in spring 2020 to better understand what is and is not working for students so the department can continue to make improvements. We expect a deep analysis of this will be done in 2020-2021.

Q33 Do you have another goal to update?

Yes

Page 11: III. Previous Goals: Update (If Applicable) continued

Q34 Previous Goal 2:

Training Tutors for the Math Pathways program

Q35 Which College Strategic Goal does this department goal most directly support? **Basic Skills Acceleration**

Q36 Please describe how this goal advances the college strategic goal identified above.

With the Math Pathways program and the changes our department has implemented in the classroom (using a student-centered learning environment), it is important we continue to train tutors. Many, if not all, of the tutors went through our classes before these changes were implemented and for them to more effectively help our students, they need to be trained to understand what happens in the classroom.

Q37 Goal Status **Deleted**

Page 12: III. Previous Goals: Update (If Applicable) continued

Q38 Please describe the results or explain the reason for deletion/completion of the goal:

While this activity technically is ongoing, the math department has determined this goal is more appropriately categorized as an activity in support of Goal 1, and so it will be included there and deleted as a separate goal.

In 2019-2020, Tutoring received \$3500 to train tutors. This will be used in spring 2020 to train three tutors, one in Math 176 and two in Math 160. This training will include paying the tutors to sit in the classroom for up to 8 weeks to see how the teacher sets norms, runs the classroom, uses a student-centered teaching philosophy, and help with any gaps in the understanding of the material.

Q39 Do you have another goal to update? **Yes**

Page 13: III. Previous Goals: Update (If Applicable) continued

Q40 Please describe action steps for the year: **Respondent skipped this question**

Q41 How will this goal be evaluated? **Respondent skipped this question**

Q42 Do you have another goal to update? **Respondent skipped this question**

Page 14: III. Previous Goals: Update (If Applicable) continued

Q43 Previous Goal 3:

Marketing for Math Pathways

Q44 Which College Strategic Goal does this department goal most directly support? **Basic Skills Acceleration**

Q45 Please describe how this goal advances the college strategic goal identified above.

From our past experiences, we expected to have issues this year with what math course is best for students. Due to past marketing efforts, we had many fewer students enrolling in an incorrect course than we expected, but we do still need to continue marketing the Math Pathways program to Counselors and new students so they understand what the program is about and what math course(s) is best to take based on their study plans.

Q46 Goal Status

Deleted

Page 15: III. Previous Goals: Update (If Applicable) continued

Q47 Please describe the results or explain the reason for deletion/completion of the goal:

While this activity technically is ongoing, the math department has determined this goal is more appropriately categorized as an activity in support of Goal 1, and so it will be included there and deleted as a separate goal.

During the 2018-2019 academic year, the Chair of the Math Department met with counseling several times to inquire about the assessment and placement changes and ensure they had everything they needed to help students. As a result, several new reports were created and changes were made to Math Competency to help with the Evaluations Office. The Counselors continue to call, ask questions, and help ensure everything is smooth for the students. The Chair continues to send regular emails and meet with Counseling as needed to keep the lines of communication open. As a result, the department has a good relationship with counseling.

Q48 Do you have another goal to update?

Yes

Page 16: III. Previous Goals: Update (If Applicable) continued

Q49 Please describe action steps for the year:

Respondent skipped this question

Q50 How will this goal be evaluated?

Respondent skipped this question

Q51 Do you have another goal to update?

Respondent skipped this question

Page 17: III. Previous Goals: Update (If Applicable) continued

Q52 Previous Goal 4:

Interdisciplinary Concurrent Enrollment Support Courses

Q53 Which College Strategic Goal does this department goal most directly support?

Basic Skills Acceleration

Q54 Please describe how this goal advances the college strategic goal identified above.

Due to articulation issues with SDSU regarding Math 160 for psychology majors, we have seen students taking Math 096 (or even Math 160+060) and then PSY 215. For most students, this is a waste of a semester. For this reason, we are working with the Psychology Department to offer a Math 060 support course linked to a PSY 215 starting in fall 2019. This will allow students to complete their statistics requirement in one semester.

Q55 Goal Status **Deleted**

Page 18: III. Previous Goals: Update (If Applicable) continued

Q56 Please describe the results or explain the reason for deletion/completion of the goal:

While this activity technically is ongoing, the math department has determined this goal is more appropriately categorized as an activity in support of Goal 1, and so it will be included there and deleted as a separate goal.

The department worked with the Psychology Department during the 2018-2019 academic year so we could link a Math 060 with a PSY 215 course. This first course was offered in fall 2019. The retention rates for this first semester are 97% and we are hoping for high success rates as well. The two faculty work closely together to ensure students get the support they need to be successful.

Q57 Do you have another goal to update? **No**

Page 19: III. Previous Goals: Update (If Applicable) continued

Q58 Please describe action steps for the year: **Respondent skipped this question**

Q59 How will this goal be evaluated? **Respondent skipped this question**

Q60 Do you have another goal to update? **Respondent skipped this question**

Page 20: III. Previous Goals: Update (If Applicable) continued

Q61 Previous Goal 5: **Respondent skipped this question**

Q62 Which College Strategic Goal does this department goal most directly support? **Respondent skipped this question**

Q63 Please describe how this goal advances the college strategic goal identified above. **Respondent skipped this question**

Q64 Goal Status **Respondent skipped this question**

Page 21: Copy of page: III. Previous Goals: Update (If Applicable) continued

Q65 Please describe the results or explain the reason for deletion/completion of the goal: **Respondent skipped this question**

Page 22: Copy of page: III. Previous Goals: Update (If Applicable) continued

Q66 Please describe action steps for the year: **Respondent skipped this question**

Q67 How will this goal be evaluated? **Respondent skipped this question**

Page 23: IV. New Goals (If Applicable)

Q68 Would you like to propose any new goal(s)? **Yes**

Page 24: IV. New Goals (If Applicable) continued

Q69 New Goal 1:

Support student success in each Academic and Career Pathway (ACP)

Q70 Which College Strategic Goal does this department goal most directly support? **Guided Student Pathways**

Q71 Please describe how this goal advances the college strategic goal(s) identified above.

One of our primary goals has been to get students through their math requirements as quickly and efficiently as possible, while providing pathways tailored toward students' specific goals. We adjust our offerings as necessary in support of these pathways. Since Math 160 (Elementary Statistics) and Math 120 (Quantitative Reasoning) are the only math requirements for most non-BSTEM majors, demand for these courses has increased dramatically.

The instructional materials used in Math 160 have evolved to be more equity-minded, relating directly with students' academic and career pathways. The Chair is working with the Math 120 faculty to ensure the same is true for this course. In addition, the department is working with the biology, chemistry, and physical science departments to ensure that the material taught in the math courses remains relevant to the various BSTEM academic and career pathways and provides students with a solid understanding of the math they will need in their future science and engineering courses.

Q72 Please indicate how this goal was informed by SLO (student learning outcome) assessment results, PLO (program learning outcome) assessment results, student achievement data, or other data:

A very small percentage of the students taking a math course are actual math majors. For the majority of our students, math is either a GE requirement or a prerequisite for one or more of the courses required for their major. It is essential that we meet the students where they are and support them on their path. In fall 2019, we offered twenty sections of Math 160 (five with concurrent support) that enrolled over 600 students (626). In addition, the instructional materials used in Math 160 have evolved to be more equity-minded, relating directly with students' academic and career pathways.

Prior to fall 2019, the demand for Math 120 had gone down so that we did not offer any sections of this course in 2018-2019, which we realized was a bad decision. This has changed for spring 2020. Because of changes in placement policies and increased marketing of the course, we are already seeing good enrollments in our two section offerings.

With the shortening of the pipeline overall, the number of sections of STEM courses has increased dramatically from 14 sections in fall 2015 to 21 sections in fall 2019. This tells us more students than ever before are making it through the math sequence. One important aspect of all this work is ensuring that students in math classes are learning the appropriate skills that are helping them succeed in their science and engineering courses.

Q73 Action steps for this year:

We will continue to collaborate with other departments to ensure students are getting through their math requirements as quickly and efficiently as possible, while still supporting them through their academic and career pathways. Recently, we collaborated with the psychology department to provide a concurrent support course, pairing MATH 060 with PSY 215 (Statistics for Behavioral the Sciences). Students are now able to complete their math requirements in a single semester with the best math course for their major. We will continue to refine the instructional materials for this MATH 060 course to better support the psychology and social science students.

Political Science has a new course, POSC 170, Introduction to Political Science Research Methods. Terrie Nichols is planning to work with the new Political Science instructor so we can link a Math 160 with this new course in fall 2021. This will help students planning to study Political Science learn statistics as it is related to their career pathway.

To support STEM students, we offered a MATH 180/280 (calculus I & II) combo course in spring 2019 so students could complete both in the same semester and enroll in their physics classes sooner. This class was not successful as successful as we would have liked. We deemed that the students entering MATH 180 were not ready for such an intensive math program. For many students, this was their first semester of college and their first exposure to calculus. We still believe it will benefit students to get through the calculus sequence more quickly, so we have decided to offer a MATH 280/281 (calculus II & III) combo course for spring 2020. By the time they reach MATH 280, they will have had a semester of college and of calculus behind them and we expect to see better results from this combo course. We will continue to monitor the progress of students and look for ways to improve the program.

Also in support of STEM students, Dan Curtis has proposed a sabbatical for spring 2021 to work in collaboration with Miriam Simpson of the Physics Department to produce supplemental videos and online Canvas resources to help students in calculus and physics courses. Calculus and physics are difficult subjects for students to learn and without a strong algebra and trigonometry background, students often struggle. By specifically targeting the requisite algebra and trigonometry skills, the materials produced during this sabbatical will provide students with the direct support they need. This will free up more time in the classroom to focus on the calculus topic at hand instead of having to spend time remediating prerequisite skills.

The department has made significant changes in support of the BSTEM pathways by offering concurrent support courses for PreCalculus and Business Calculus. This has shortened the pipeline for BSTEM students dramatically. We plan to continue working with the Biology, Chemistry, Physical Science, and Business Departments to ensure that the material taught in the math courses remains relevant to the various BSTEM academic and career pathways and provides students with a solid understanding of the math they will need in their future science, engineering, and business courses.

In fall 2018 and spring 2019, many members of the math department (part-time and full-time) participated in the year-long equity-minded training institute. With the overhaul of this program as the Equity-minded Teaching & Learning Institute (EMTLI), two math department members are currently participating in this year-long program. The math department also has a strong presence within the UMOJA program and plans to continue and expand this relationship. Applying what we learned, over the next year we plan to redesign our instructional materials to better serve our diverse group of students. We plan to design culturally relevant materials aimed to broaden students' worldview. Specifically, we plan to develop materials for our statistics course tailored to be relevant to Latinx culture.

Q74 How will this goal be evaluated?

We will continue to work with other disciplines to get updated information about the progress of our students, getting feedback on what skills students are deficient in and using that feedback to make adjustments that will better prepare our students. By effectively using SLO data, we will be able to ensure our students are leaving our classes with the skills they need to be successful in subsequent classes.

Q75 Do you have another new goal?

No

Page 25: IV. New Goals (If Applicable) continued

Q76 New Goal 2: **Respondent skipped this question**

Q77 Which College Strategic Goal does this department goal most directly support? **Respondent skipped this question**

Q78 Please describe how this goal advances the college strategic goal(s) identified above. **Respondent skipped this question**

Q79 Please indicate how this goal was informed by SLO (student learning outcome) assessment results, PLO (program learning outcome) assessment results, student achievement data, or other data: **Respondent skipped this question**

Q80 Action steps for this year: **Respondent skipped this question**

Q81 How will this goal be evaluated? **Respondent skipped this question**

Q82 Do you have another new goal? **Respondent skipped this question**

Page 26: IV. New Goals (If Applicable) continued

Q83 New Goal 3: **Respondent skipped this question**

Q84 Which College Strategic Goal does this department goal most directly support? **Respondent skipped this question**

Q85 Please describe how this goal advances the college strategic goal(s) identified above. **Respondent skipped this question**

Q86 Please indicate how this goal was informed by SLO (student learning outcome) assessment results, PLO (program learning outcome) assessment results, student achievement data, or other data: **Respondent skipped this question**

Q87 Action steps for this year: **Respondent skipped this question**

Q88 How will this goal be evaluated? **Respondent skipped this question**

Q89 Do you have another new goal? **Respondent skipped this question**

Page 27: IV. New Goals (If Applicable) continued

Q90 New Goal 4: **Respondent skipped this question**

Q91 Which College Strategic Goal does this department goal most directly support? **Respondent skipped this question**

Q92 Please describe how this goal advances the college strategic goal(s) identified above. **Respondent skipped this question**

Q93 Please indicate how this goal was informed by SLO (student learning outcome) assessment results, PLO (program learning outcome) assessment results, student achievement data, or other data: **Respondent skipped this question**

Q94 Action steps for this year: **Respondent skipped this question**

Q95 How will this goal be evaluated? **Respondent skipped this question**

Page 28: V. Resources Needed to Fully Achieve Goal(s)

Q96 Is the program requesting resources this year to achieve this program goal(s)? (Faculty Resource Needs, Classified Staff Resource Needs, Technology Resource Needs, Supplies/Equipment Resource Needs, Facilities Resource Needs or Other Resource Needs) **Yes**

Page 29: VI. Faculty Resource Needs

Q97 Are you requesting one or more Faculty Positions to achieve this program goal(s)? **Yes**

Page 31: VIII. Classified Staff Resource Needs

Q98 Are you requesting one or more Classified Positions to achieve this goal? **No**

Page 33: X. Technology Resource Needs

Q99 Are you requesting technology resources to achieve this goal? **No**

Page 35: XIV. Supplies/Equipment Resource Needs

Q100 Are you requesting supplies and/or equipment resources to achieve this goal? **No**

Page 37: XVI. Facilities Resource Needs

Q101 Are you requesting facilities resources to achieve this goal(s)? **Yes**

Page 39: Final Check

Q102 Are you ready to submit your program review?If you would like to go back and review a section, select a section a click "Next." **I am ready to submit my program review**
