Math Program Review
Spring 2023

Mission

The Department Mission remains the same as stated below:

The Math Department of San Diego Mesa College seeks to cultivate a culture of mathematical excellence in an equity-minded and inclusive forum that equips students for success in their future endeavors. We foster their curiosity and appreciation for math while empowering them to expand their abilities to think and to communicate effectively.

Overview of faculty

The math department currently has 15 full-time faculty, all of whom are tenured. The department also has 1 dual math/engineering faculty member. Our department has 2 of 3 PRO-RATA teaching in Spring 2023 (Harter and Meckstroth). There are several faculty members who plan to retire in the next 4 to 5 years. Most will likely be back as pro-rata, but it leaves the department with a huge deficiency especially as it pertains to faculty hired specifically to teach the E-STEM calculus sequence. But, with the recent legislation we have faculty who have not taught the calculus series that are moving into the E-STEM calculus series. There is a concern for San Diego Mesa College to maintain its standard of mathematical preparation. We are seeing declining preparation in the calculus sequence as well as in the sciences. With the HSI Curriculum Workgroup we are encouraging interdisciplinary discussions to apprise math faculty of the importance of adequately preparing our students for their math and science courses.

Describe the successes and challenges your unit has faced since the last comprehensive review.

Mesa Math faculty have responded amazingly well given the many challenges we have faced in the past 6 years. The math and science disciplines have been hit with what feels like a meteor shower in the form of new legislation AB705 and AB1705, with the pandemic alongside. Several faculty members are doing important work outside of the department and many have participated in several professional development opportunities. Some of these are listed mentioned below.

- PUENTE
- FIGs
- CEER
- INSPIRE
- CCAP

- Professional Development Coordinator
- STEMCORE (duration of a HSI STEM grant)
- HSI Activity Director
- Summer Cruise
- Jumpstart
- Pathways workgroups
- Equity Minded Workgroup
- SHIFT
- AMATYC
- Humanizing STEM
- Community of Practice for Math 116 and Math 104/141 in Fall 2022
- Peer Mentoring Math Faculty Liaisons

More Mesa faculty are getting involved in workgroups that support collaboration within the STEM departments. We have 5 math faculty on the HSI STEM Curriculum Workgroup. Participation in the workgroup helps to bring the STEM faculty together and to examine the optimum pathway for our STEM students' success. It also has been enlightening for our math faculty to see what concepts are most important to the different science fields. Math faculty can use this knowledge to inform their teaching. We have begun hosting faculty from the sciences at some math department meetings to expand this important dialogue.

Response to pandemic: most math faculty made the transition to online. Immeasurable innovations were implemented, and many will remain to better serve our students moving forward. We are offering more online classes than pre-pandemic. We will continue to do so, while maintaining adequate mathematical preparation for our students. For the E-STEM pathway we are restricting to Partially Online which means that a minimum number of exams are on campus. Another effort is to offer at least one face-to-face class for each course. Some students need face-to-face and our veteran students need these courses to be able to utilize their benefits.

Increased Collaborations:

- **Among departmental faculty**. Our department has had difficulty with collegial interaction and participation in department meetings and departmental work. Nevertheless, in the last few years we have increased groupwise collaboration. This increased diversity and tolerance by challenging the mindset of a single "best practice"
- **More collaboration with other STEM disciplines**
    - HSI STEM Curriculum Workgroup is invaluable.
    - Initiated dialogue around content coverage in our courses as preparation for other disciplines: Other STEM faculty attended a department meeting to share what they are seeing in terms of algebra and trig readiness. We also exchanged

insights into areas of emphasis and how topics are addressed, pedagogical observations etc

- More discussion between chairs at **sister colleges and even other colleges throughout the county. There has been much communication about how to abide by the mandates brought about by AB1705**
- **Math has participated in 3 registration workshops**
- **Math has been asked to attend Department Meetings with Counseling, EOPS and to communicate changes with DSPS.**

- **The number of faculty teaching online courses has increased with nearly all teaching a portion of their courses online. This allows for more options for our students.**

The department is overwhelmingly committed to reducing costs for our students and these collaborations have been integral. Within the last 1-2 years, 60% of our courses have become zero-cost, and the others are all moving quickly in the same direction. These transitions are very labor intensive, but the unwavering commitment of some of our colleagues has generated a "critical mass" of sorts and we have the ball rolling ☺ It will also be important to continue to support the content and to collaborate, but this is one of our most exciting successes across the board.

Over the last six years, the department has experienced interpersonal and political challenges at an unprecedented level. This has grown to extreme levels because, simultaneously, the department has been lacking in consistent invested leadership. This has impacted students, and faculty as well.

If applicable, describe any major curricular or service changes your unit has engaged in and the impact of those changes since the last comprehensive review.

In response to AB705 and AB1705, we have developed several Math Courses that offer additional support.

Over the last 4 years math has created new entry-level courses that have additional support: Math 96X, Math 104X, Math 116X, and Math 119X.

These courses offer a smaller class size and more time with the instructor. They emphasize group work and collaboration amongst students.

Math 104X, Math 116X and Math 119X have also shortened the path for these students to help students complete their transfer-level math in a year or less.

Since returning to campus after the pandemic, faculty found most technology was failing. In the classrooms and faculty offices. This year we are seeing the computers replaced and getting

functioning projectors in the classrooms. This was difficult since most faculty increased their use of technology during the pandemic.

We are excited to get the math studio room update that will include movable tables and chairs, individual whiteboards for small student group work, Chromebooks to be used for online math activities, and a large electronic whiteboard. We expect to see the increased active learning in the classroom that Physics has experienced with their new studio room.

We began the Peer Mentoring program 3 years ago and have had growing attendance in the math sessions. We would like to see more students of color as the peer mentors for math.

Another challenge the math department has faced is decreasing enrollments and lack of stability brought on by the pandemic. Enrollment management has been exceedingly stressful over the past several years. We had to somehow establish a new normal in the aftermath of the COVID pandemic. Time blocks that were once viable are no longer so. It has been tricky navigating the online/on campus balance. Our sister colleges have made choices that have hampered our ability to provide quality math classes to our students. As a result of these "enrollment grabs," our class sections at Mesa with fill rates below 50% have been canceled, and the resulting displacement of faculty and students has been stressful. AB 705 and 1705 have led to even greater displacement of faculty. Some faculty have had to be reassigned to our CCAP/Legacy program at high school sites. The CCAP class schedules are very often incongruous with those on our main campus. Most importantly, entire courses have been eliminated, and many more are under threat of elimination. The student journey through our math department is very different from what it was before. Counselors and students are in a state of mass confusion, and these convulsive changes have made enrollment planning and management extremely difficult.

The math department has had 6 retirements since the last comprehensive review. With these retirements, we have lost faculty hired to teach the E-STEM path. This summer we encountered for the first time a lack of qualified faculty to teach the higher level calculus courses. The math department is also experiencing the need for faculty hired for pre-transfer

level math to move into the higher level E-STEM classes while covering the course content with the appropriate level of mathematical rigor so that students leaving the courses are successful in their subsequent math and science courses.

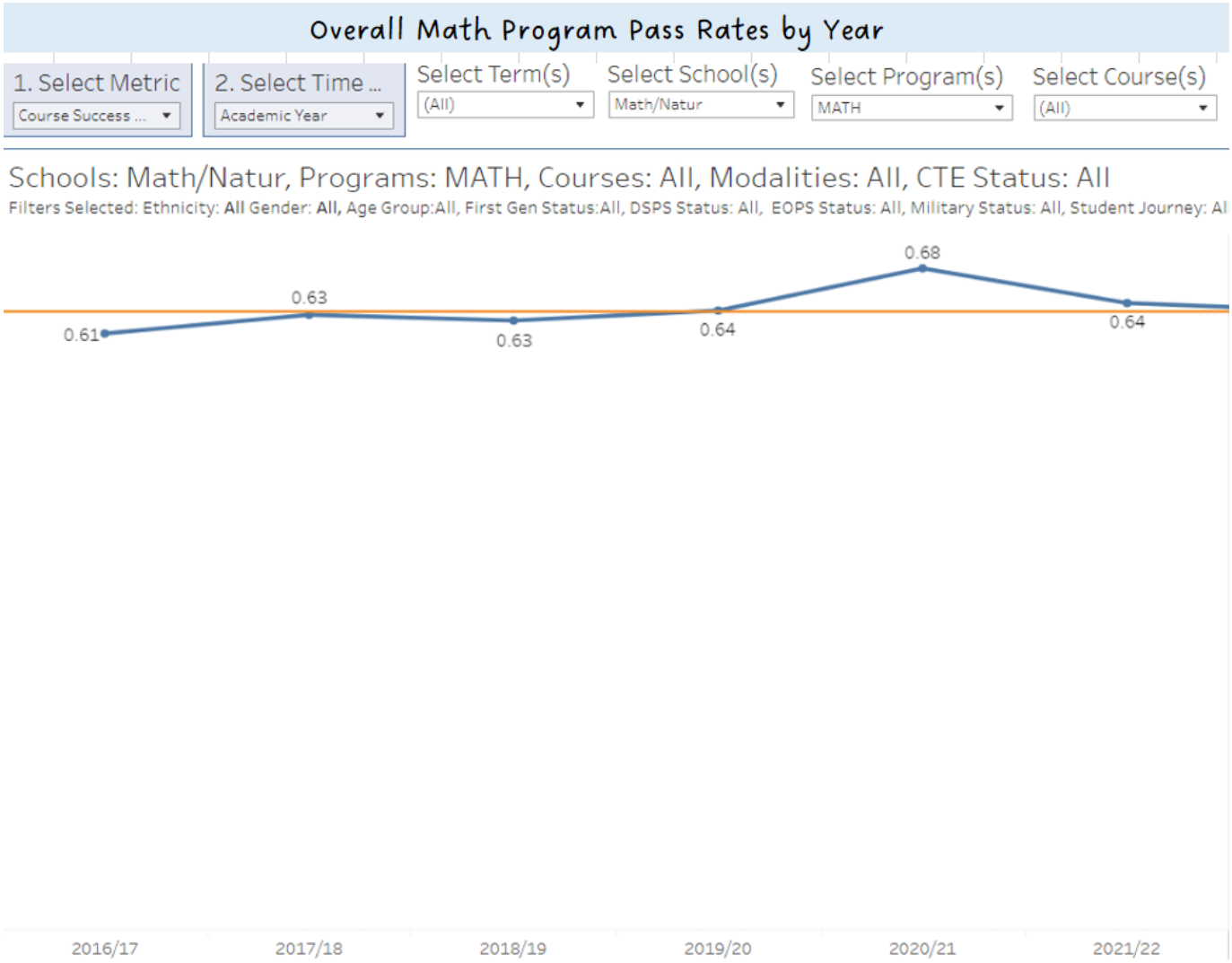
Please confirm that the department has reviewed the Course Learning Outcomes listed in CurricuNet for each course and verify accuracy.

Reviewed and Accurate

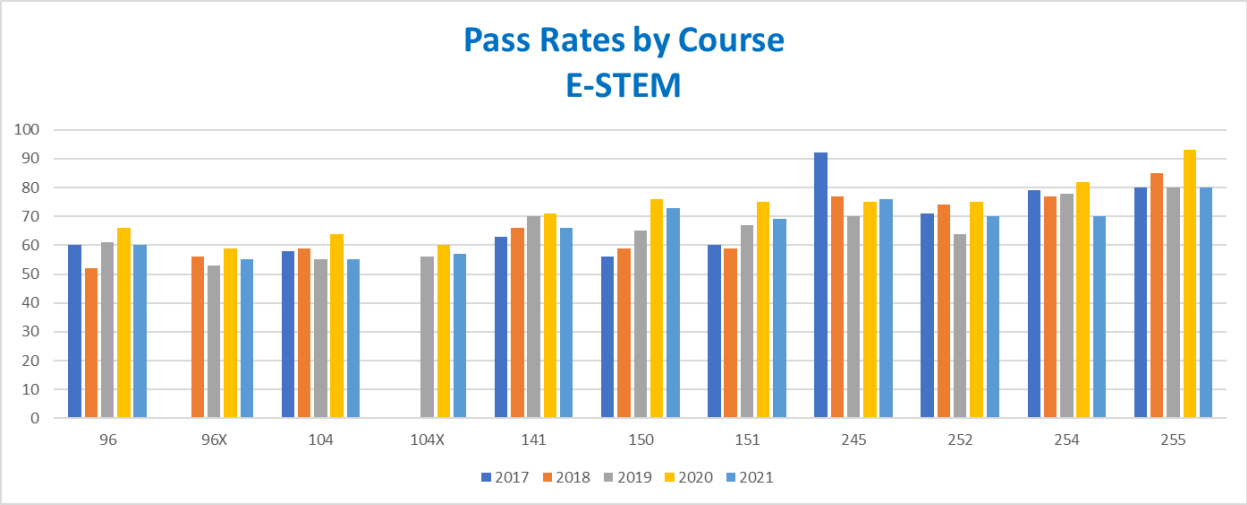
Data Reflection

Describe the trends you see in your program/service area's data (Instructional Data you may consider: enrollment trends, course & program learning outcomes, Institutional Learning Outcomes, course success and retention rates, degree completion, transfer, employment, labor market analysis, other data relevant to your unit's work).

Overall, Math has returned to a slightly higher pass rate than the year before the pandemic as you can see below.



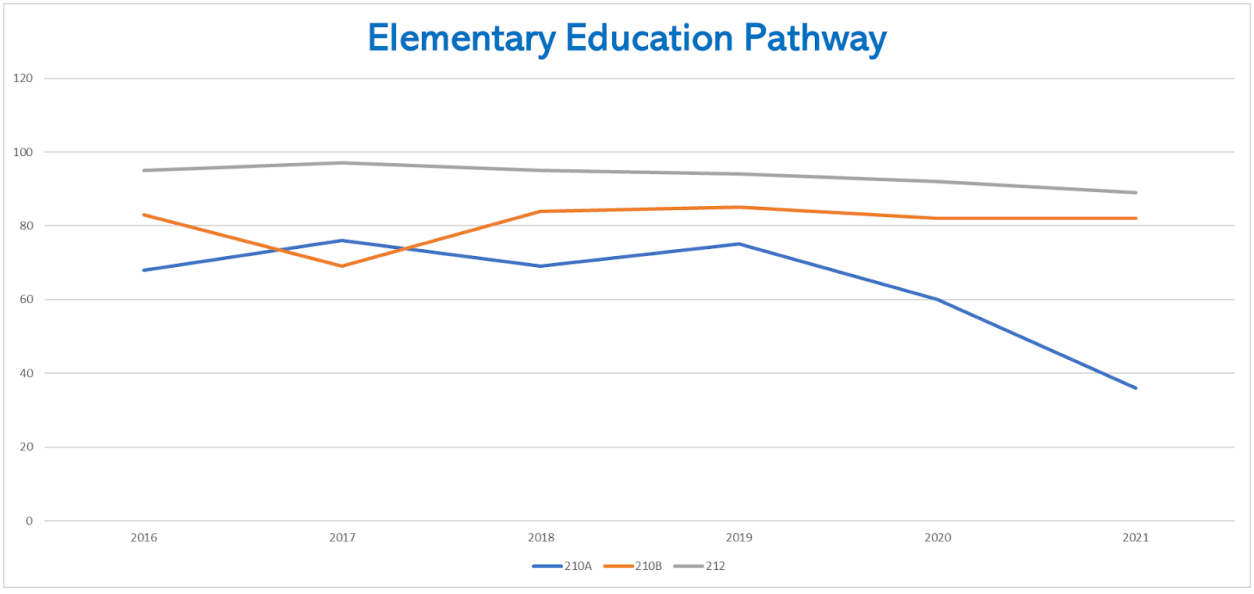
For the E-STEM pathway, the data by course is illustrated below.



For this pathway, the courses that have not returned to pre-pandemic are Math 141 and Math 254. We only offer 2 sections of Math 254 and at least one each semester was synchronous. We believe that since this course is so conceptual, that is not the best modality for this course.

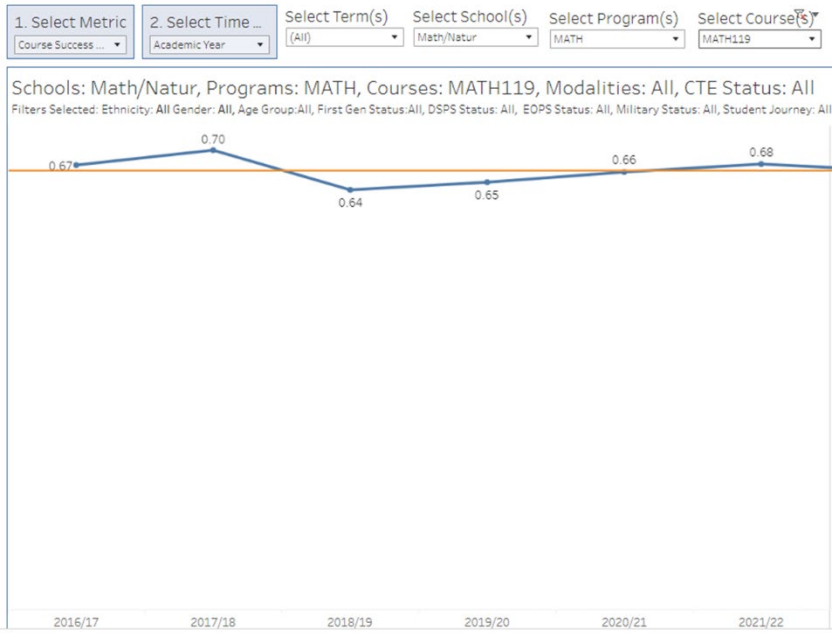
Math 141 pass rates pre-pandemic were 70% and now they are 66%. Our department is pushing to offer a Math 141X to help with this disparity. This course brings together all of the fundamental algebra and trigonometry needed for the majors in this pathway. We are also expecting that the increased communication between math faculty and physics and engineering faculty will help.

The data that we found most concerning is that for Math 210A, which is the introductory math course for math elementary education.

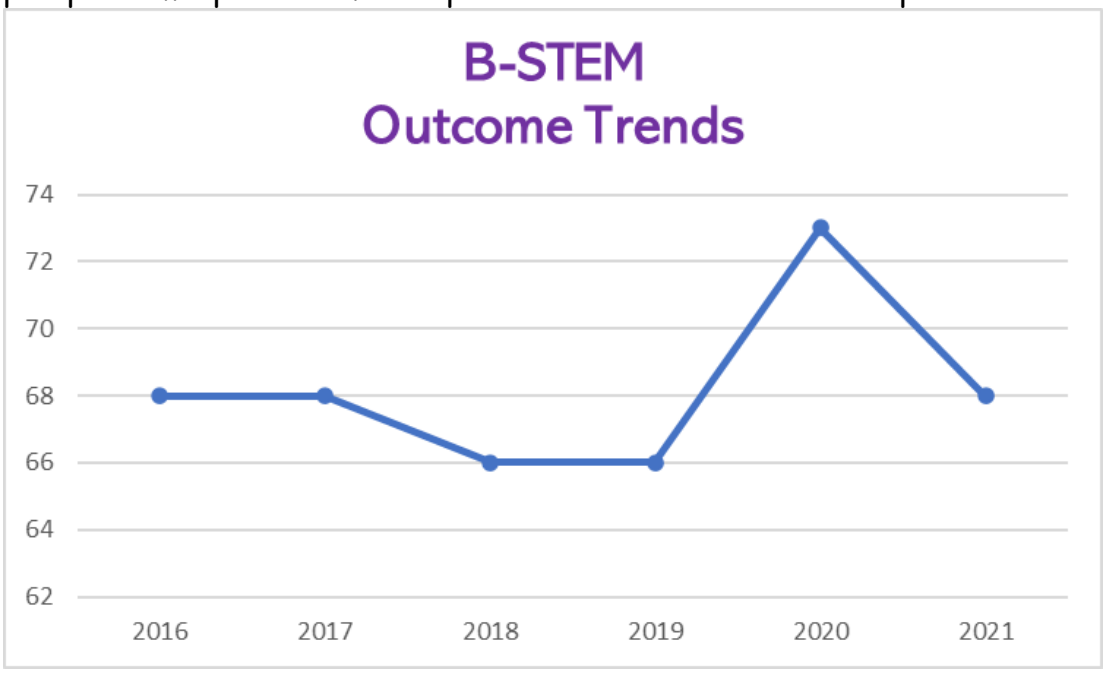


The pass rate for this critical course for the education pathway has dropped from 75% pre-pandemic to 36% pass rate. It appears that Math 210AX needed. We will also explore other options to help with this decline. This course is crucial for our Elementary Education Program. City College is working on the Curriculum for Math 210AX and Mesa will strive to offer this course Spring 2024.

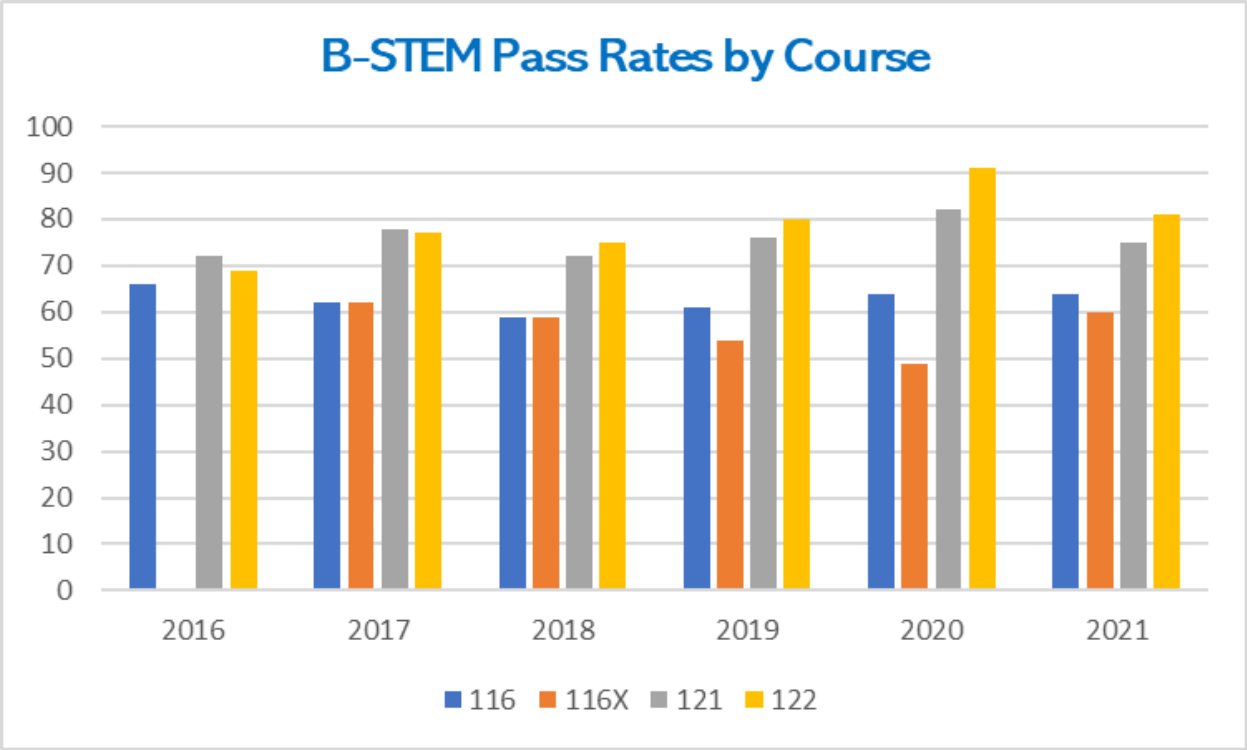
Our Statistics program has also returned to pre-pandemic rates in terms of student success as can be seen below.



Our B-STEM Pathway data shows that our post-pandemic pass rate is actually higher than the pre-pandemic pass rate. The pass rate has returned to the pass rates seen in 2016 and 2017.



And By Course for B-STEM.



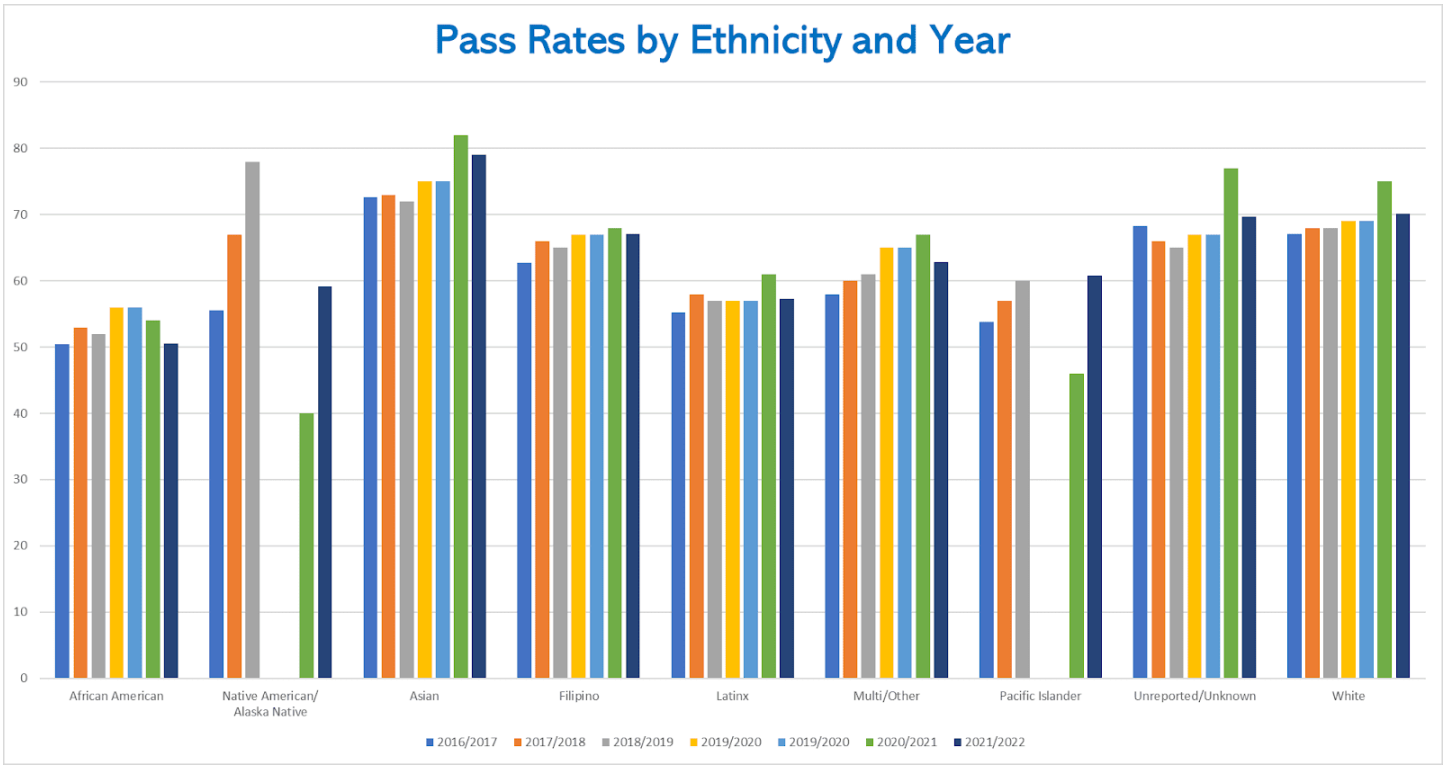
Describe any equity gaps you see in these data. Are there differences and/or patterns observed by demographics (e.g. race/ethnicity, gender, age, etc.)?

Below we can see that most of our students within each ethnicity have had pass rates return to pre-pandemic rates.

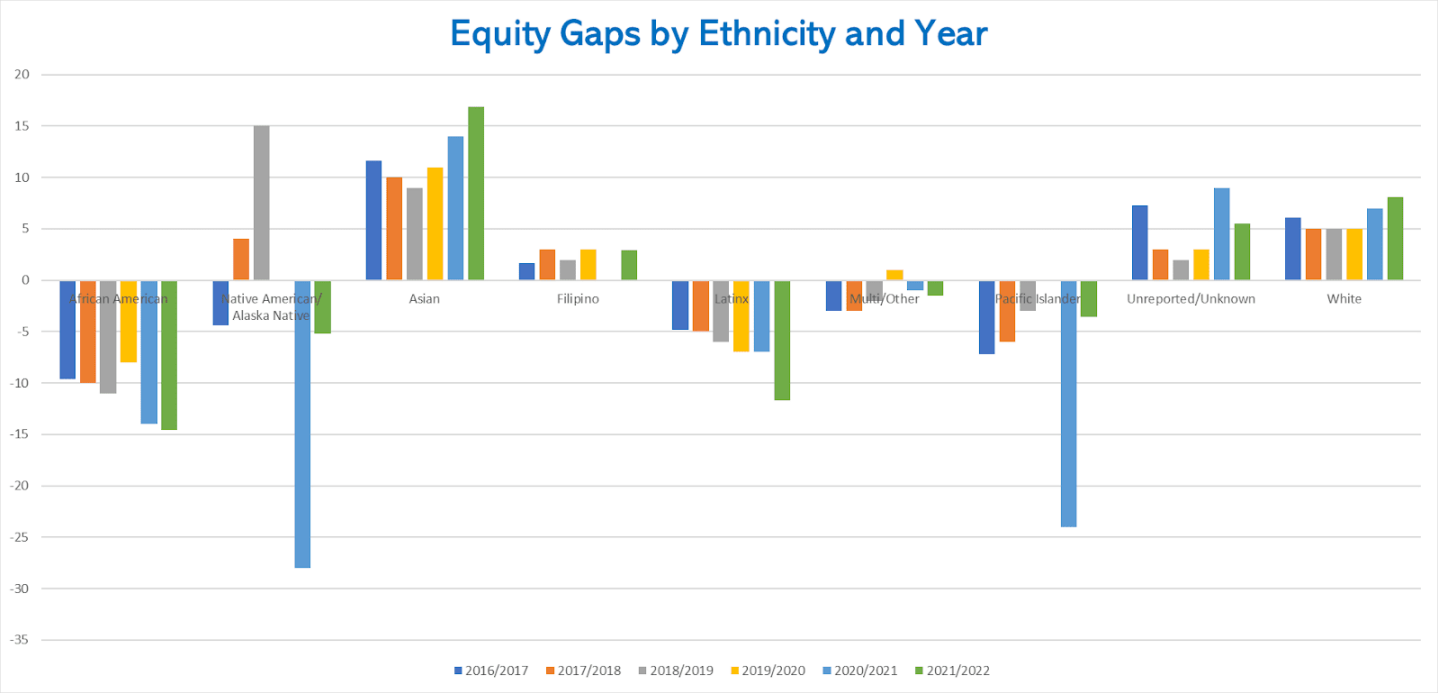
Of our minoritized students, our Latinx students have been more resilient post-pandemic with pass rates returning to what they had been previously.

Our students who have suffered lower pass rates than pre-pandemic include our African American, Native American and Multi-Ethnic students.

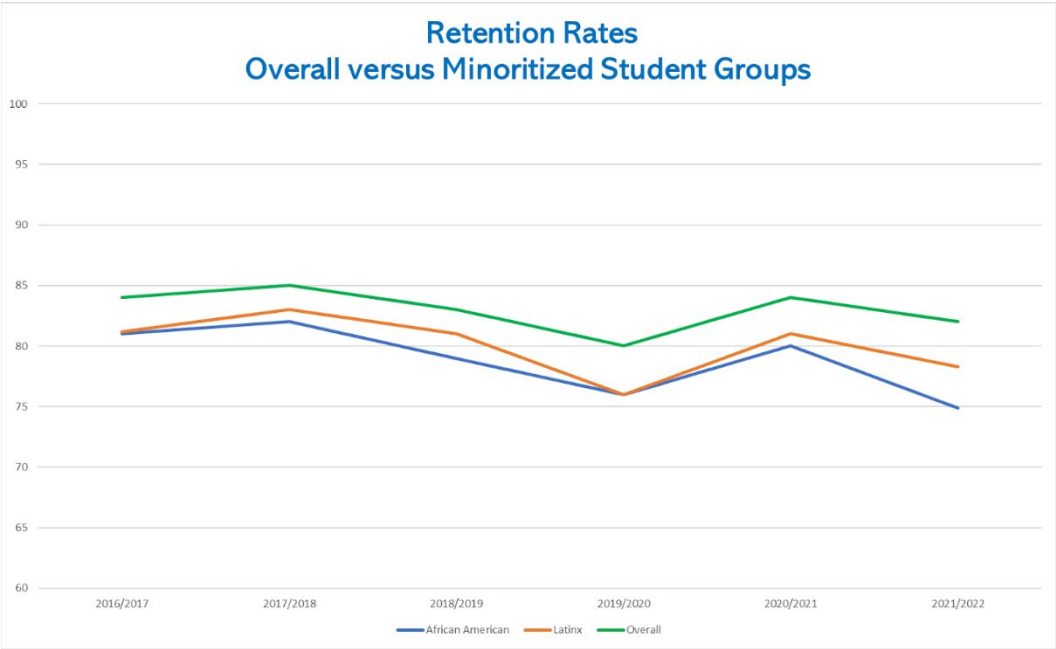
While pre-pandemic, each of these ethnic groups had seen rising pass rates, they have fallen to levels going back several years.


Pass Rates by Ethnicity and Year
90
80
70
60
50
40
30
20
10
0
African American
Native American/ Alaska Native
Asian
Filipino
Latinx
Multi/Other
Pacific Islander
Unreported/Unknown
White
2016/2017
2017/2018
2018/2019
2019/2020
2019/2020
2020/2021
2021/2022

The effects of the pandemic on our students of color is clearly indicated by the Equity Gaps by Ethnicity and Year. The equity gaps for our African American and Latinx students have grown larger over the last few years.

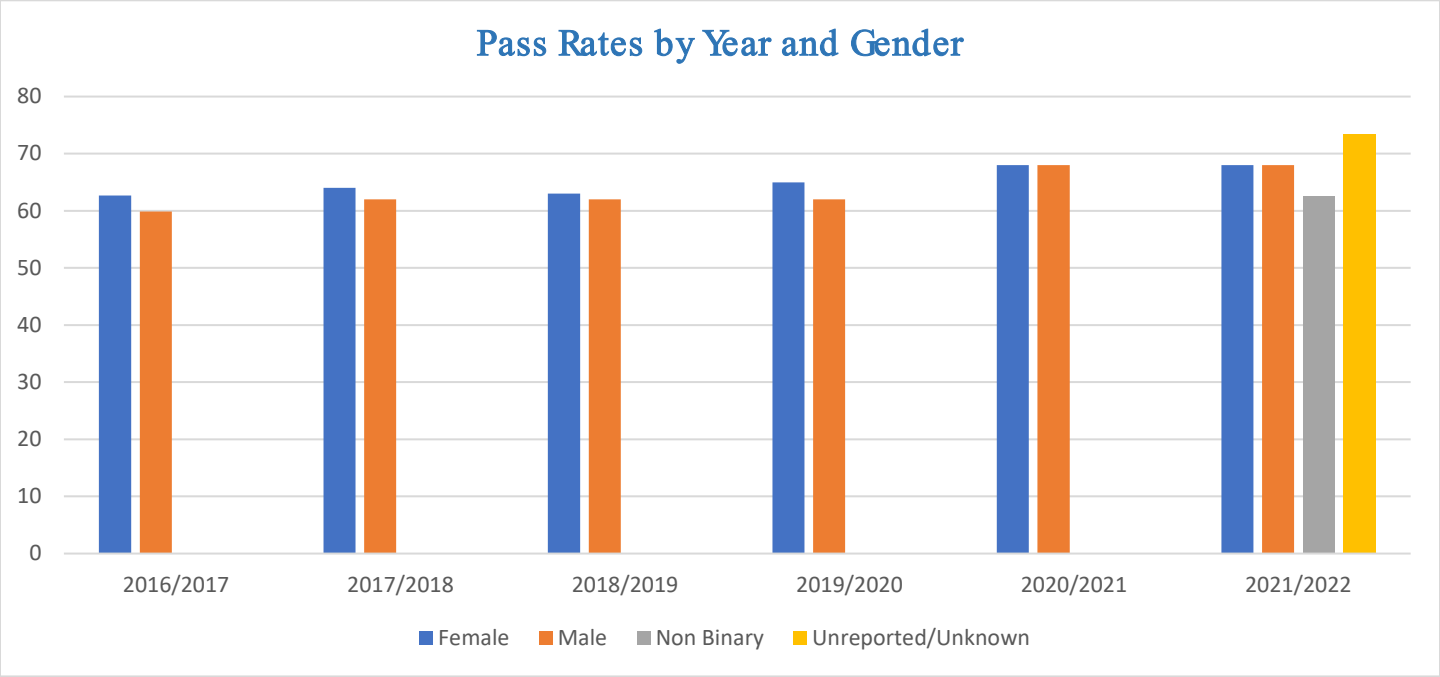


We also see the effects of the last few years on our retention rates for some of our most vulnerable student groups. Our African American and Latinx students were severely impacted. Several faculty participated in the effort to contact our students of color to offer support and encouragement to return to classes. Many of our students had to leave school to work to help support their families at the onset of the pandemic. Others did not have the technology at home needed to make the move to online classes. The chart shows the retention rates for our African American and Latinx students in comparison to the overall retention rate.



For 2021/2022 separately since this is the only year with the added identifications of gender:

Surprisingly, females tend to have higher pass rates than males throughout most years. Our non-binary students have lower pass rates and those students who did not report their gender had the highest pass rate (these last two categories have just been added in the year 2021/2022).



Data Below:

Overall Math Pass Rate	61%	63%	63%	64%	68%	68%
Pass Rates	2016/2017	2017/2018	2018/2019	2019/2020	2020/2021	2021/2022
Female	62.7	64	63	65	68	68
Male	59.9	62	62	62	68	68
Non Binary						62.5
Unreported/Unknown						73.5

Describe the discussion(s) that took place about the unit's learning outcomes assessment data.

The common thread in our math department meetings is **how to best** address the learning loss our students have after learning online and the social anxiety they are experiencing as a result of the isolation during the pandemic. In addition to that, our students have had increasing stress placed upon them during the last few years.

Some best practices currently used by faculty:

- Come to the class half an hour early to have cookies or other treats on test day to foster community and lower anxiety.

- Allowing formula cards on exams.
- Offering optional midterms to replace one of the first two exams.
- Allowing the final exam to replace an exam, giving students the motivation to learn the material, giving another chance to demonstrate knowledge, and also increase their grade.
- Having students do projects instead of traditional exams. This way students can seek help from the instructor along the way. The projects illustrate how math can be used in the real world.
- Allowing students to do quizzes in pairs and share in video format. Some students really enjoy this while others not so much.
- Offering office hours in a classroom so that students can work together.
- Allowing extra time on exams dependent on room availability.

Unit Goals

Goal 1: Complete the Studio Room Redesign

1. **Community: this room will provide collaborative workspaces, whiteboards, Chromebooks and an electronic whiteboard.**
2. **Stewardship: this room will include up to date technology that students can utilize in class for Desmos activities and Programming activities.**

Goal 2: Create new calculus courses Math 121x and Math 150x with agreed upon textbooks.

1. Completion: these courses will eliminate 1 and 2 prerequisite courses, respectively. They will also focus on creating zero cost resources for students that are of the same level of mathematical rigor as the agreed upon textbooks in the department.

2. Community: the practices in these courses will allow for more student group work and more time with their instructor.

Goal 3: Create assignments for Math 118 and Math 116 so that they will qualify for the new Leaf Designation.

1. Scholarship: these assignments will focus on sustainable practices, climate change and real-life mathematical problems.

2. Community: the assignments will be given as group projects, when possible, to increase student engagement and collaboration.

Goal 4: Continue to participate in professional development, with an emphasis on active learning in the classroom.

1. **Stewardship & Scholarship: help decrease equity gaps and increase success rates.**
2. **Community: active learning in the classroom will increase student participation, student engagement, and collaboration.**