SAN DIEGO MESA COLLEGE

Program Review

Summary and Reflections with Unit Goals, Action Plans, and Updates

Academic and Learning Support - STEM Programs

Executive Summary

Describe the successes and challenges your unit has faced since the last comprehensive review.
One of the major successes we achieved was the acquisition of a Title III HSI grant. This grant not only provided us with additional funding but also validated the value and impact of our STEM program within the community. The grant allowed us to invest in advanced equipment for classrooms, new technology resources, and faculty development opportunities, ultimately enhancing the quality of education and research in STEM disciplines.
Another significant success has been the expansion of our peer mentoring services into new disciplines. Recognizing the importance of peer support in student success, we broadened our mentoring program beyond its initial focus on specific STEM fields. By incorporating new disciplines such as physics for life science majors (Physics 180 sequence), organic chemistry, and engineering we have created a more comprehensive support system for students pursuing diverse STEM pathways. This expansion has fostered a stronger sense of community among students, increased retention rates, and improved academic outcomes.
Furthermore, we successfully expanded the physical space of our STEM center. With the growing demand for STEM education, the previous facility was no longer sufficient to accommodate our expanding student population and program offerings. Through careful planning, collaboration with campus stakeholders, and securing additional funding through Title III and Title V funds, we were able to renovate and expand the STEM center to incorporate LRC 116 in addition to LRC115. The new facility now features state-of-the-art computers, models and kits, collaborative study spaces, and dedicated areas for, STEM counseling, tutoring and peer mentoring.

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.
Since the last comprehensive review, our unit has undertaken significant curricular redesign in the areas of chemistry, mathematics, and physics, thanks to the support of our new Title III grant. These changes have had a transformative impact on our program, enhancing the learning experience for students and improving their academic outcomes.
With the grant's assistance, we were able to engage in a comprehensive redesign of the curriculum in chemistry, mathematics, and physics. This redesign aimed to modernize and align the content with our four-year partners and emerging trends in STEM fields. Previously, STEM disciplines were often taught as separate entities in their own “silos.” However, the redesigned curriculum encourages students to recognize the interconnectedness of these fields and apply knowledge from one discipline to another. This integrated approach nurtures a holistic understanding of STEM subjects and prepared students for the interdisciplinary nature of modern scientific research and problem-solving.

If applicable, describe the impact of any new resources (human, fiscal, etc) on the unit and/or action plan implementation.
Our new grant's funding has been instrumental in our efforts to redesign our STEM classrooms into smart interactive high-tech learning environments, specifically designed to enhance modern science education. One of the primary impacts of these new resources is the transformation of our STEM classrooms into state-of-the-art, smart interactive spaces. The grant funding has allowed us to invest in cutting-edge technology, including interactive whiteboards, multimedia displays, modular furniture, and specialized software applications. These resources will enhance the learning experience for our students, providing them with immersive and engaging opportunities to explore scientific concepts through hands-on activities, collaborative group work, simulations, and virtual experiments. The interactive nature of the technology encourages active participation, collaboration, and critical thinking among students. By the end of the grant we will have introduced at least four new modern classrooms to our Mathematics & Natural Sciences building.

If you assess OUTCOMES, please confirm that the outcomes have been reviewed for accuracy. If you do not assess Outcomes, skip this question.
Reviewed & Accurate

Related Documents for Charts and Graphs

Executive Summary Complete
Yes

Data Reflection

Trends observed in program/service area's data.
We have seen a huge increase in the engagement of students with our various programs including peer mentoring, Path to STEM Success events, and the STEM Center.

Peer Mentoring Attendance numbers:
Fall 2021 - 117 unique students with 873 occurrences
Spring 2022 - 211 unique students with 1,683 occurrences
Fall 2022 - 524 unique students with 3,436 occurrences
Spring 2023 - 700 unique students with 3,287 occurrences
Fall 2023 - 1004 unique students with 3,351 occurrences
Spring 2024 - 1230 unique students with 3,766 occurrences

We also see an increase in enrollment in the classes that are supported by the various activities of the grant.

STEM Center attendance continues to grow both in-person and virtually. In particular, we observed over 13,000 contact hours with 10,000 student visits inside the STEM Center in Spring 2024. Typical utilization involved 250-300 contact hours by students - while some peak days exceeded 500 with over 80 students simultaneously taking advantage of services.

This past summer, 2024, Path to STEM Success collaborated with CRUISE and our STEM orientation became part of the program. This increased our attendance at this event from an average of 30 students to 92 unique students who received STEM counseling, and an introduction to the STEM Center, MIP, and MESA program.

Describe any equity gaps in the data. Are there differences and/or patterns observed by demographics (e.g.race/ethnicity, gender, age, etc.)
Equity gaps exist in some STEM majors for our Latine population, particularly, Computer Science and Chemistry. Latine are overrepresented in Biology, Nursing, Mathematics, Allied Health, and Physics. The other STEM majors are at the representation of the campus. However, we are still seeing a 6% equity gap in overall success in STEM courses.
Further, although peer mentoring attendance has increased overall, Latine head count only accounts for 36% of the headcount, even though the campus is 40% Latine. However, it is worth noting that for those Latine students who engage with peer mentoring, their success rates in those classes have closed that equity gap.

Related Documents for Charts and Graphs
Grant Objectives_APR Y2 Data.xlsx

Describe the discussion(s) that took place about the unit's learning outcomes assessment data.
The new grant has biweekly meetings with all members of the team including faculty, classified professionals, supervisors, and administration. Data conversations occur regularly at these meetings. The APR is disseminated among team members as well as the campus Executive team. Biannual evaluations with an external evaluator include all team members and campus Executive team. Also, the faculty lead, program director, STEM Center supervisor and research analyst have biweekly meetings to discuss outcomes and further data collection needs.
In this past year, the team has decided to change the baseline data for the grant from 2019/2020 to 2021/2022 in order to capture the true effect of the grant activities post-Covid. This change has been approved by the Program Officer at the DOE and will be reported in Year 3's APR.

Data Reflection Complete
Yes

Practice Reflection

Describe current practices your program/service area has engaged in that you believe impact the above data trends and equity gaps.
Bringing services back to campus as well as the course sections that we serve has been the central factor to increase in engagement. Further, each semester we increase the number of peer mentors that we employ and we have extended the course list that are served. Further, keeping virtual services open as well helps to serve those students that cannot make it to campus for whatever reason. We do see equity gaps among our Latine community, however, the objectives of the grant are being met.

Summary and Reflection

What other factors (internal or external) might also impact the above data trends and equity gaps?
The only objectives not met in the first year of the new grant were all based on enrollment. Even though our objectives are based on the Hispanic and Latine community, the overall enrollments of the campus have been trending down, even before the pandemic. Over the past year we have started to see an incline. We will need to watch numbers closely to see if our objectives are trending in the same direction the campus is.

Related Documents for Charts and Graphs

Practice Reflection Complete
Yes

Mid-Cycle Updates

YEAR 2 Updates (2023 - 2024)

Provide any edits or updates to the prompts originally documented in the Executive Summary section for Year 2.
N/A

Provide any edits or updates to the prompts originally documented in the Data Reflection section for Year 2.
We have entered our Year 2 APR data to be reported to the Department of Education. We are still falling behind on some metrics, but are improving from Year 1. It is tough with the baseline year being 2019, pre-pandemic, as we continue to recover and grow post-Covid.

Review Outcomes Report. Review the unit's outcomes assessment process for 2022 - 2023. Discuss connections to unit goals/action plans/resource requests.

Provide any edits or updates to the prompts originally documented in the Practice Reflection section for Year 2.
N/A

YEAR 3 Updates (2024 - 2025)

Provide any edits or updates to the prompts originally documented in the Executive Summary section for Year 3.
The past year has come with some successes as well as some challenges. Our STEM orientation has merged with CRUISE, which has increased the number of students that have benefited from those STEM specific services. This also goes to the institutionalization of the orientation program past the life of the grant. Our numbers of engagement in activities as well as enrollments in STEM courses for our Latine population has increased and almost closed equity gaps. Further, Biology has completed their studio classroom redesign, leaving only Chemistry. We also doubled the amount to STEM faculty that have engaged with culturally relevant professional development by bringing ESCALA to campus for a two-day workshop with Fall project implementation.
AB 1705 poses a significant challenge for our STEM majors, particular those of color, women, and older students. Because of the effects of AB 705 and 1705, we have increased peer mentoring for the Calculus series and have included CHEM 152 into the peer mentoring program. Students who have not had higher math in high school, for whatever reason, but want to be STEM majors are struggling with starting in Calculus and CHEM 152, both of which are requirements for all STEM majors. As students of color and women still tend to be counseled out of higher math classes in high school, this legislation affects them even more. We will be watching the success rates closely in the upcoming years and continue to advocate for a Pre-Calculus course for those that have not had the opportunity.

Provide any edits or updates to the prompts originally documented in the Data Reflection section for Year 3.
The data reflection has been updated with Year 3 data. The APR data will be added as soon as it is available.

Review Outcomes Report. Review the unit's outcomes assessment process for 2023 - 2024. Discuss connections to unit goals/action plans/resource requests.
N/A

Provide any edits or updates to the prompts originally documented in the Practice Reflection section for Year 3.
Again, implementation of AB1705 is central to the grant's curriculum work group's conversations and advocacy. Also, professional development has increased for all STEM faculty. There is some real concern of the effect of AB1705 on equity gaps in the Calculus series and entry Chemistry classes and the team will be keeping a close eye on those figures over the next year. We are working on curricular changes, but run into the aligned curriculum issue at times as well as state guidelines. For now, peer mentoring continues to close equity gaps in course success, retention, and GPA.

Summary and Reflection

YEAR 4 Updates (2025 - 2026)

Provide any edits or updates to the prompts originally documented in the Executive Summary section for Year 4.

Provide any edits or updates to the prompts originally documented in the Data Reflection section for Year 4.

Review Outcomes Report. Review the unit's outcomes assessment process for 2024 - 2025. Discuss connections to unit goals/action plans/resource requests.

Provide any edits or updates to the prompts originally documented in the Practice Reflection section for Year 4.

YEAR 5 Updates (2026 - 2027)

Provide any edits or updates to the prompts originally documented in the Executive Summary section for Year 5.

Provide any edits or updates to the prompts originally documented in the Data Reflection section for Year 5.

Review Outcomes Report. Review the unit's outcomes assessment process for 2025 - 2026. Discuss connections to unit goals/action plans/resource requests.

Provide any edits or updates to the prompts originally documented in the Practice Reflection section for Year 5.

Unit Goals, Action Plans, and Updates

Expand the STEM Center Space and Capacity

Unit Goal: Expand the STEM Center space and capacity in order to meet the increasing needs and demands of students.

Goal Status: Active

Beginning Year: 2022 - 2023

Projected Completion Year: 2025 - 2026

Mapping
Mesa College Strategic Plan: Roadmap to Mesa2030:

- **Completion - Objective 4:** Support students' access to resources to mitigate the impact caused by technological and basic needs insecurity (✓)
- **Stewardship - Objective 4:** Establish a college-wide practice and schedule that addresses routine maintenance and renewal of equipment, facilities and technology to ensure access to adequate resources and better serve students (✓)

Action Plans	Updates
Action Plan Status: Active **Action Plan:** 1. Purchase laptops, calculators, software, and other STEM supplies needed for inside and outside the classroom. 2. Follow usage data carefully and identify tables, chairs, and other spatial needs for student use. 3. Work with LRC team to identify needs of students and how the STEM Center can contribute to those needs. **Action Plan Cycle:** 2025 - 2026, 2024 - 2025, 2023 - 2024, 2022 - 2023	**Submission Date**: 12/03/2024 **Action Plan Update**: Usage continues to grow. We were able to secure a supplemental award for additional peer mentors and supplies for the STEM Center. **Update Year**: 2024 - 2025 **Action Plan Progress**: On Track **Submission Date**: 12/11/2023 **Action Plan Update**: Usage in the STEM Center has increased significantly during the Fall 2023 semester and we expect even more students in the Spring. Other than purchasing regular supplies, such as markers, the Title III grant has purchased 9 more tables with wheels for student use in this area. The new tables allows us to use all of the chairs that were purchased two years ago in anticipation of this increase in usage. We have also purchased more calculators for student use and moved the computers from the middle of the room, to against the wall to create more floor space. **Update Year**: 2023 - 2024 **Action Plan Progress**: On Track

Improve and expand STEM tutoring and mentoring services.

Unit Goal: Improve and expand STEM tutoring and mentoring services.

Goal Status: Active

Beginning Year: 2022 - 2023

Projected Completion Year: 2025 - 2026

Unit Goals, Action Plans, and Updates

Mapping
Mesa College Strategic Plan: Roadmap to Mesa2030:

- **Completion - Objective 3:** Design and promote programs and services that intentionally target a reduction in equity gaps in completion outcomes (✓)
- **Scholarship - Objective 4:** Expand the use of innovative and high-quality teaching, learning, and support practices that achieve equitable outcomes and increase student success (✓)

Action Plans	Updates
Action Plan Status: Active **Action Plan:** 1. Continue offering peer mentoring on campus and identify spaces where sessions can occur as the program expands. 2. Continue to work with STEM faculty in identifying and hiring a diverse and inclusive team of peer mentoring students. **Action Plan Cycle:** 2025 - 2026, 2024 - 2025, 2023 - 2024, 2022 - 2023	**Submission Date**: 12/03/2024 **Action Plan Update**: We had to unfortunately decrease the number of peer mentors this year due to budgeting. However, we didn't decrease too much due to AB1705 funding and a supplemental award that we secured. Regardless, the number of students engaging with peer mentoring continues to rise and due to AB1705, we are including CHEM 152 to the courses list. **Update Year**: 2024 - 2025 **Action Plan Progress**: On Track **Submission Date**: 12/11/2023 **Action Plan Update**: For Fall 2023, we have a crew of 19 peer mentors. Fall 2023 has served nearly 1000 students, a huge jump from Spring 2023. Peer mentors provide academic support for 13 different STEM courses with incredible success data for those that participate in comparison to students who do not engage with the program. Working with faculty and the HSI team, we have identified the need for 5 more peer mentors for the Spring 2024 semester. **Update Year**: 2023 - 2024 **Action Plan Progress**: On Track

Improve STEM professional learning across campus.

Unit Goal: Improve STEM professional learning across campus.

Goal Status: Active

Beginning Year: 2022 - 2023

Projected Completion Year: 2025 - 2026

Mapping
Mesa College Strategic Plan: Roadmap to Mesa2030:

- **Community - Objective 4:** Remove barriers to equitable participation by developing, incentivizing and creating structures for all employees to engage in and design professional learning (✓)
- **Completion - Objective 1:** Develop pathways that provide students with clarity about degree, certificate, and transfer requirements. (✓)

Unit Goals, Action Plans, and Updates

- **Scholarship - Objective 1:** Expand and prioritize professional learning experiences for all employees that create parity in outcomes across racial/ethnic groups and all disproportionately impacted groups (✓)

Action Plans	Updates
Action Plan Status: Active **Action Plan:** 1. Support STEM faculty with various professional learning opportunities offered on campus including MOST, FIGs, CEER, and others. 2. Bring ESCALA to campus to offer STEM focused professional learning. **Action Plan Cycle:** 2025 - 2026, 2024 - 2025, 2023 - 2024, 2022 - 2023	**Submission Date**: 12/03/2024 **Action Plan Update**: We did bring ESCALA to the campus in May 2024, where 34 STEM faculty, staff, and students engaged with professional development centered on the Latine experience. We also trained 6 facilitators so we can continue this program on a yearly basis without the ESCALA price tag. Plans for next May have already begun. **Update Year**: 2024 - 2025 **Action Plan Progress**: On Track **Submission Date**: 12/11/2023 **Action Plan Update**: In the past year, we have had 11 more employees engage in professional learning. We are working on getting more faculty to engage with FIGs, as well as provide professional learning opportunities for classified professionals, students, and administrators. We are currently in talks with ESCALA on two programs. One of the programs will train employees on our campus to be facilitators of professional development themselves. This will help to increase the number of participants as the expertise will be on our campus. Travel costs, compensation, and people's time have proven to be minor barriers to increasing these numbers. **Update Year**: 2023 - 2024 **Action Plan Progress**: Barriers Encountered