

2016 Annual Performance Report

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UNIVERSITY OF NEW MEXICO

Grantee Name

1700 LOMAS BLVD NE, ALBUQUERQUE, NM 87106

Grantee Address

P031S140055

PR Award Number

187985

Unit (NCES) ID

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Title V - Developing Hispanic-Serving Institutions

Department of Education Grant Program

STEM Collaborative Center: Collaborative strategies to maximize efficiency and improve STEM achievement for Hispanic, low-income and high-need students

Project Title

4-year Public

Type and Control of Institution

Year 2

Grant Year

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Section 1: Executive Summary

1. The impact of the grant on the institution's capacity to contribute to fulfilling the goals of the legislation.

The STCC addresses two primary goals: GOAL ONE improve persistence and graduation in STEM for Hispanic, low-income and high need students (meeting the legislated purpose “expand educational opportunities for, and improve the academic attainment of, Hispanic students); GOAL TWO strengthen UNM’s capacity to serve Hispanic, low-income and high-need students by increasing collaboration and accountability among academic units and student services departments (meeting the legislated purpose “enable HSIs to expand and enhance their academic offerings, program quality and institutional stability.” Based on these goals and the purpose of Title V legislation, the STEM Collaborative Center implemented the following initiatives during Year One (among others).

STEM SUMMER (GOAL ONE). During Year Two, the STCC offered 27 extra-curricular events for STEM undergraduate students. Each of these events was developed in cooperation with UNM and regional STEM professionals. Selected examples include: Drones & 3D imaging with UNM COSMIAC, Personal Genomics with UNM Anthropology, STEM Public Policy with UNM Center for Education Policy Research, Public School STEM Outreach with UNM SACNAS, Lab Tours with the Air Force Research Lab, Factory Tour with Intel New Mexico, Nanotechnology with the Advanced Materials Lab, Trinity Site History and Implications with the National Nuclear History Museum, Health Science Career Exploration with the UNM Health Sciences Center, Emerging Research & Technology with the UNM Consortium Lab in Los Alamos, and Field Research in Parasitology with the UNM Museum of Southwest Biology.

Through these programs, the STCC served 134 undergraduate students, 95 of whom were Hispanic and/or low-income. Of these, 23 were also first-year or second-year students. This latter number represents a decline from Year One, and also falls significantly short of our Year Two goal. The greatest challenge has been reaching first-year and second-year students. As students reach junior and senior status, they easily see the value in STCC programming and eagerly participate. But reaching entry-level students has been difficult. To meet this challenge in Year Three, the STCC will develop stronger partnerships with STEM instructors in 100 and 200 level courses; will develop more programming focused on STEM career exploration; and will open STEM Summer participation to incoming freshman who have completed their New Student Orientation sessions.

Despite lower than anticipated participation numbers, correlated achievement outcomes have been favorable. There is a strong correlation between participation in STEM Summer and STEM Leadership programming and retention at UNM. In the Fall of 2015, 97.9% of STEM Center students either graduated or returned for the Spring of 2016. This compares to 85.9% for all STEM undergraduate students. In the Spring of 2016, 93.4% of STEM Center students either graduated or returned for the Fall of 2016, compared to 81.8% for all STEM undergraduate students.

DISCOVER STEM (GOAL ONE): Rather than relying on a single student conference to meet these numbers, the STCC has created a modular approach. The STCC partners with other conferences to expand their STEM student offerings, and the STCC sponsors a STEM conference for entering freshman (Discover Your Science Day, or DYS). During Year Two, the STCC rolled out its first DYS conference, collaborating with more than 10 other UNM departments.

DYS included participation by 68 incoming first-year UNM students. Using pre- and post-surveys, participants reported increased levels of knowledge and confidence in the following: knowing where to get academic support, knowing how to meet other STEM students, and knowing where to get help with degree planning.

STEM LEADERSHIP (GOAL ONE): The STEM Leadership program was originally proposed as a cohort-driven STEM academy. However, it quickly became apparent that the STCC could not meet its objectives through such a time-intensive model. Simply put, few STEM students have enough time to commit to an unpaid long-term intensive academy that does not award academic credit. Consequently, the STCC shifted the model from a cohort-driven academy to a modular events format. In the revised format, students participate in those STEM Leadership events that best fit their schedules, interests and needs. During Year Two, these events included a mentorship program with the Air Force Research Lab (AFRL), multiple community engagement and outreach events, undergraduate research workshops, and a publication workshop. Of these, the AFRL mentorship program proved to be the cornerstone. The STCC will work to expand on the successes of this program by partnering with additional labs and STEM businesses.

STCC COLLABORATIONS (GOAL TWO): STCC Collaborations take the following forms: (1) teams, (2) projects and (3) reports/recommendations.

TEAMS

Regionally, the STCC helped found the Albuquerque Regional STEM-H Ecosystem. This network of networks is supported by the ABQ Explora Science and Children’s Museum, and includes participation from UNM, Central New Mexico College, Sandia National Labs, Mission Graduate, Albuquerque Public Schools, Intel, UNM Health Sciences Center, and many other regional STEM partners. This group is working together to improve math literacy as a gateway to STEM professions in central New Mexico.

PROJECTS

Per the original grant proposal, the STCC supports the development of at least four collaborative projects per year. In Year Two, the STCC supported five such projects, including (among others):

Math Preparation Roadshow. This pilot project tested the hypothesis that site-based pre-enrollment math review/preparation may improve the accuracy and level of math placement. Currently, UNM relies heavily on the ACT exam to place math students in the proper math course. However, many students take their ACT scores more than a year before enrolling in college. UNM also utilizes a separate placement exam as a backup (Compass and Accuplacer). For this project, the STCC and College Enrichment Programs sent UNM math tutors and a math instructor to Artesia, New Mexico. There, incoming first-year students reviewed and prepped for the placement exam. Of the seven students who then took the placement exam, five placed higher than their earlier ACT placement. While this project demonstrated potential, the site-based components remains too costly for wide-spread implementation. However, we are studying the model for elements that could be conducted in Albuquerque instead.

Math/Chem 121 Learning Community. At UNM, biology students must complete MATH 121 (College Algebra) or higher before enrolling in CHEM 121 (General Chemistry). Both of these course are pre-requisites to entry-level biology courses. Working with math and chemistry faculty, the STCC and the Associate Dean of A&S explored the possibility of restructuring a MATH 121 section to match CHEM 121. For this pilot, the topics of MATH 121 will be taught in the order they are needed in CHEM 121, so that students can take the two courses simultaneously. The pilot for this project will be offered Fall 2017 through the University College Learning Community program.

REPORTS

The primary report published by the STCC is the annual State of STEM Report. This report was not completed in Year One, but was completed in full during Year Two. The State of STEM Report was developed cooperatively by the STCC and faculty from the UNM Center for Education Policy Research (CEPR). In preparing the report, CEPR interviewed 18 faculty members and administrators, and 14 students from various STEM disciplines. The report was submitted to the President and Provost in the fall of 2016, and was made available online at the STCC website.

Recommendations for improving STEM undergraduate education at UNM included (among others): Restructure work-study awards to integrate undergraduates more quickly into the disciplines they are perusing; Incentivize excellence in teaching; Expand the College of Engineering model of career development to other disciplines and to lower division courses; and Provide much more career exposure to undergraduates.

DATAMART TOOLS (GOAL TWO): During Year Two, the DataMart program at UNM underwent significant restructure and improvement. The DataMart now utilizes cloud-based technology to enhance UNM's capacity to perform complex analyses. Due to this change, the STCC has expanded the use of online STEM options in addition the DataMart. The STCC has also expanded its role in STEM data analysis, WebFocus tool development, and online tool development. The following projects were completed under this STCC initiative:

Online Tool for Tracking Extracurricular Activities. This tool allows the STCC to track student participation in STCC programming, and to provide reports regarding participant's majors, ethnicity, and academic performance. Our goal is to make this tool available to other programs in Year Four, once the platform is completely stable.

Webfocus Development. During Year Two, the STCC programmer learned how to utilize WebFocus platform to build automated queries for the STCC and other STEM programs. In Year Three, these queries will include a standardized student achievement outcomes report that will provide demographic and outcomes data to UNM STEM departments. These outcomes will be standardized through a partnership with the Office of Institutional Analytics and the Office of Enrollment Management.

Major Data Analysis Projects. During Year Two, the STCC conducted three major analytics projects, including the analysis of high impact programs and first year STEM students at UNM, the 2017 STEM student outcomes benchmarking reports, and an analysis of geology & honors STEM student outcomes and transfer trends. In addition, the STCC also conducted nine other smaller data analysis projects.

2. How has the grant helped to carry out the mission of the institution?

UNM's mission statement reads, in part, "The mission of the University of New Mexico is to serve as New Mexico's flagship institution of higher learning through demonstrated and growing excellence in teaching, research, patient care, and community service; Educate and encourage students to develop the values, habits of mind, knowledge, and skills that they need to be enlightened citizens, contribute to the state and national economies, and lead satisfying lives."

In summer 2017, as per the original grant application, the external reviewer met with staff, students, faculty, administrators and other key stakeholders to determine grant progress and impact. The following excerpts from her report demonstrate how the grant is helping to carry out UNM's mission:

"UNM STCC successfully developed a STEM infrastructure at the University. As demonstrated through executive level support, integration into University planning, and visibility of project activities; UNM STCC appears to have been embraced and supported by stakeholders throughout the institution. During the site visit it was obvious that UNM STCC is quickly becoming an integral part of campus life and is viewed as a driving force for institutional change in STEM."

"UNM STCC continues to excel in creating internal and external partnerships that support student success in STEM. The project maintains strong commitment from various business, industry and organizations. These partnerships are most commonly demonstrated through STEM Summer and events, presentations and experiences that provide STEM access to students. The project continues to provide student access to professionals in the field, which included exposure to educational and professional expectations in labs, graduate school, medical school and other common pathways for STEM

students. The number and extent of the external partnerships is outstanding given the short amount of time the project has been in place. One outstanding example of the partnerships created through UNM STCC is the AFRL Mentorship Program.”

“The AFRL Mentorship Program was new in PY#2 of the grant. This partnership represents extended resources for UNM STEM students to actively engage in meaningful experiences that benefit their career pathway long-term. Whether mentors offer basic services to the STEM students or go above and beyond to provide internship opportunities, the experience gained by STEM students is invaluable and would not be possible without the collaborative efforts of UNM STCC. “

“Equally impressive are the internal partnerships created by the project. Faculty, staff and students demonstrated strong appreciation for the opportunities generated by UNM STCC. Faculty expressed a strong connection to the project programming and staff and indicated that beyond programming UNM STCC creates opportunities for cross-curricular conversations that do not often occur, especially between north and main campus. Furthermore, faculty that have consistently engaged in UNM STCC collaborations recognized access to additional STEM opportunities due to the infrastructure created through the project. It is evident that the partnerships created by UNM STCC represent one of the strongest aspects of the project and is likely to have the greatest impact on the institution long term.”

“The role of UNM STCC to improve student engagement provide innovative approaches for STEM support is evident. Throughout the site visit the positive impact of UNM STCC programming was clear. It is apparent that the project has been successful in creating a sense of connection for students and created an environment that embraces STEM student involvement and support. Partners and staff regularly commented on the ability of UNM STCC to connect various areas on campus and create consistency with services delivered to students. This is an enormous task for a project to undertake. It is exceptional that UNM STCC has made such an impact in bringing together campus resources for STEM students in an effort to improve their experiences. This impact is anticipated to grow based on conversations with project staff related to course-based services and expanded collaborations with faculty to secure future funding.”

If your institution has experienced any unexpected outcomes as a result of this grant, that affect for better or worse its capacity to fulfill the goals of the legislation, tell us about them here.

One of the most exciting unanticipated outcomes of this project is the founding of a regional STEM Ecosystem. This project was co-founded by Mission Graduate, the STCC, the UNM Health Sciences Center and Explora Science and Children’s Museum. In part, it was developed to mimic the STCC’s collaborative functions, but on a regional level. The project was proposed to Mission Graduate by the STCC and the UNM Health Science Center. Mission Graduate led the startup phase of the project, and Explora stepped in to serve as the network’s backbone organization. This network has identified math preparation as their key regional mission in promoting STEM education, and is specifically focused on educating parents to better support their children’s math needs. In Year One, the network applied unsuccessfully for an NSF INCLUDES grant, and is applying again in Year Two. Though the STCC is not leading this effort, it is because of the STCC and UNM Health Sciences that this effort came about.

Tell us about any challenges that you have had during the reporting period or that you anticipate in the coming year which may affect your ability to meet the goals of your grant. Include, if applicable, your institution’s plans to meet these challenges.

Two challenges faced by the STCC are the result of positive change at UNM. First, in the original grant application, the STCC was tied into a small DataMart project through the Office of Institutional Analytics. During Year Two, UNM expanded the DataMart project to include new technology and software engineers. The result is that UNM is able to complete far more comprehensive analytics projects than before. For the STCC, the result of this increased institutional capacity is that the STCC can now expand the variety of tools used to assist with STEM data analysis, including the use of WebFocus and STEM data analysis projects. While this retasking required a small transition time, the STCC is now situated to perform this expanded role. Second, in the original grant application, the STCC partnered with the Graduation Project in the Office of Student Academic Success on the STEM Graduation Project. However, to improve efficiency and effectiveness, the Graduation Project has been moved to the Office of Enrollment Management. Again, this change resulted in a few transition challenges, but the STCC still met project outcome targets, and is situated to perform well in Year Three.

Section 2: Accreditation

Institution's primary accrediting agency.

The Higher Learning Commission of the North Central Association

Section 3: Activities, Focus Areas, and Outcomes

Total Expenditures during the Reporting Period

Total federal dollars spent on your Title III/V grant: \$614,431.63

Total federal dollars spent on Title III/V project management and evaluation: \$3,000.00

Total remaining federal dollars spent on your Title III/V activities (Line 1 - Line 2): \$611,431.63

Total number of activities: 1

Grant Activities and Outcomes

Grant activity:

Development of a STEM Collaboration Center to maximize efficiency and improve STEM achievement for Hispanic, low-income and high-need students.

Total Spent: \$611,431.63

Focus Area: Student Services and Outcomes

Legislative Allowable Activities	Dollars Spent	% of Dollars
Tutoring, counseling, and student service programs designed to improve academic success.	\$466,431.63	76
Other Activity: Improving the effectiveness of existing STEM support programs by increasing collaboration and developing shared tools (including those related to outcomes analysis)	\$145,000.00	24

Process Measures

LAA Category: *Tutoring, counseling, and student service programs designed to improve academic success.*

Other Did the number of STCC STEM Summer student events/opportunities increase over 2013-14 baseline year?	Yes
<i>If yes:</i> Start # <u>0</u> End # <u>27</u> Application Objective <u>0</u>	
Other Did the number of STCC STEM Leadership student events/opportunities increase over 2013-14 baseline year?	Yes
<i>If yes:</i> Start # <u>0</u> End # <u>10</u> Application Objective <u>0</u>	

LAA Category: *Other Activity*

Other Did the number of collaborative STEM projects increase (multi-department project, sponsored by the STEM Center)?	Yes
<i>If yes:</i> Start # <u>4</u> End # <u>5</u> Application Objective <u>4</u>	
Other Did the number of datamart tools increase (sponsored by the STEM Center)?	No
<i>If yes:</i> Start # <u>2</u> End # <u>1</u> Application Objective <u>4</u>	

Focus Area: Student Support Services Outcomes

This section depicts institutional outcomes that can be categorized in this focus area. Information is provided on the measures that the grantee felt were *most reflective of their activities supported by Title III/V funds* for the current reporting period. Grantees were required to answer at least two of the measures questions.

Has the institution's retention rate improved?	Yes
Cohort: STEM-interested first-year Hispanic and low-income or high need students If yes: Initial rate <u>77.66</u> Final rate <u>79.75</u> Goal <u>0</u> I would like to provide a brief supporting statement: Initial rate = 2913-14 cohort, Final rate = 2015-16 cohort	
Other, please specify: Has STEM interest among Hispanic and low-income first year students increased?	Yes
Cohort: Hispanic, low-income students If yes: Initial # <u>49.37</u> Final # <u>52.29</u> Goal <u>0</u> I would like to provide a brief supporting statement: Initial rate = 2013-14 cohort, Final rate = 2015-16 cohort. Numbers indicate percent of cohort who selected a STEM major during first year.	
Other, please specify: Has the four-year STEM graduation rate increased?	Yes
Cohort: Hispanic and low-income students If yes: Initial # <u>9.34</u> Final # <u>14.26</u> Goal <u>0</u> I would like to provide a brief supporting statement: Initial rate = 2010-11 cohort, Final rate = 2012-13 cohort.	

Section 4: Project Status

Below is a list of objectives for each activity carried out over the current reporting period.

Activity: Development of a STEM Collaboration Center to maximize efficiency and improve STEM achievement for Hispanic, low-income and high-need students.

Narrative Supporting Completed Objectives

Below are statements with data and references to goals stated in the grant application as appropriate to document the objectives that were "completed" during each year of the grant.

Activity Objective(s)	Evidence of Completion
MO4. Compared to 2013-14 historic data, increase the proportion of Hispanic, low-income and high need first-year students who return to UNM for their third year by 2%.	This number increased from 65.51% in for the 2013-14 cohort to 68.85% for the 2014-15 cohort, a 5 percent increase.
MO5. Compared to 2013-14 historic data, decrease the proportion of Hispanic, low-income and high need first-year students who go on to switch majors away from STEM degrees within two years by 10%.	This number decreased from 20.82% for the 2013-14 cohort to 17.06% for the 2014-15 cohort, a 18 percent decrease.
A02. 30 students will re-enter their STEM degree program or accelerate their STEM degree progress with assistance from the STEM Graduate strategy.	In Year Two, 36 STEM students re-entered UNM to complete their degrees due to the assistance of the STCC.
A06. At least four collaborative STEM activities will be sponsored by the STEM Center.	The STCC completed the following five collaborative initiatives: Math Prep Roadshow, MATH/CHEM 121 Learning Community, students.unm.edu redesign, online event scheduling tool, and the UNM FIVE essential skills website.
A08. STCC will publish one State of STEM Report.	STCC collaborated with faculty in the UNM Center for Education Policy research to write and distribute the Year Two State of STEM Report

Changes to Activity Objectives

Below are statements with data and references to goals stated in the grant application as appropriate to support and explain the need for the changes of objectives during the reporting period.

Activity Objective(s)	Proposed Objective Change	Reason(s) for Change	Change approved by the ED Program Office
M06. Compared to 2013-14 historic data, increase the number of Hispanic, low-income and high need STEM undergraduate students who are enrolled at UNM by 7%.	Change to: Compared to 2013-14 historic data, increase the proportion of Hispanic, low-income and high need STEM undergraduate students who are enrolled at UNM by 7%.	Due to declining high school populations, UNM's overall enrollment has declined. This change will allow for the STCC to track STEM interest among the target population regardless of changes in overall enrollment patterns. This number increased from 49.55% in 2013-14 to 50.02% in 2015-16.	No
A07. At least 4 datamart tools will be created by the STEM Center.	Change to: At least 4 online tools or significant data analysis projects will be completed by the STEM Center.	During Year Two, the Office of Institutional Research reconfigured UNM's DataMart infrastructure. This resulted in a significantly improved data analytics system at UNM. By adding the WebFocus platform, other online tool formats, and data analysis projects to the objective, the STCC will better meet UNM's current STEM data needs.	No

Changes in Objective Schedule

Below are statements with data and references to goals stated in the grant application as appropriate to support and explain the need for objective schedule changes.

Activity Objective(s)	Reason(s) for Change	Expected Completion Date
MO3. Compared to 2013-14 historic data, increase the proportion of Hispanic, low-income and high need first-year students who return to UNM for their second year by 5%.	UNM increased this number from 77.66% for the 2013-14 cohort to 79.95% for the 2015-16 cohort. While this 3% increase is significant, it does not meet the target of 5%.	September 2017
A01. 60 STEM-interested first-year and second-year Hispanic, low-income and high need students will participate in STEM Summer.	STEM Summer served 134 undergraduate STEM students, 71% of whom were Hispanic or low-income. However, only 23 of these students were first-year or second-year students. This represents a significant and unanticipated drop from Year One, and we are developing strategies to raise this rate for Year Three.	September 2017
A03. 400 students will participate in Discover STEM Conference activities.	Discover STEM served 251 students in Year Two, which represented an 128% increase over Year One. However, we have not yet met this objective and are adding programming for Year Three.	September 2017
A04. 40 STEM-interested first-year and second-year Hispanic and low-income students will participate in the STEM Leadership Academy.	STEM Leadership served 45 undergraduate STEM students, 62% of whom were Hispanic or low-income. However, only 12 of these students were first-year or second-year students. We are developing strategies to raise this rate for Year Three.	September 2017

Section 4: Budget Summary

Category	Carryover Balance from Previous FY	Actual Budget	Expenditures	Non-Federal Expenditures	Carryover Balance	Next Year's Actual Budget	Changes (Y/N)
Personnel	\$70,697.20	\$340,680.00	\$391,593.50	\$0.00	\$19,783.70	\$360,728.58	No
Fringe Benefits	\$20,385.53	\$110,012.00	\$119,733.61	\$0.00	\$10,663.92	\$119,121.00	No
Travel	\$3,420.31	\$7,000.00	\$12,704.40	\$0.00	(\$2,284.09)	\$6,000.00	Yes
Equipment	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	No
Supplies	\$17,471.17	\$41,000.00	\$68,801.54	\$0.00	(\$10,330.37)	\$50,000.00	Yes
Contractual	\$0.00	\$3,000.00	\$3,000.00	\$0.00	\$0.00	\$3,000.00	Yes
Construction	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	No
Endowment	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	No
Other	\$0.00	\$19,000.00	\$18,598.58	\$0.00	\$401.42	\$0.00	No
Total	\$111,974.21	\$520,692.00	\$614,431.63	\$0.00	\$18,234.58	\$538,849.58	

Line Item Budget Narrative

Travel

Note regarding change from original budget: Travel for UNM faculty and staff to explore best practices at other institutions was conducted in year two, rather than in year one as originally budgeted.

Supplies

Note regarding change from original budget: In the original budget, the costs for creating the State of STEM report were budgeted under contractual. Instead, the costs were accrued in supplies. The report was still created by faculty, and involved faculty and student participation throughout. Consequently, the actual budget for contractual was reduced \$12,000, and the actual budget for supplies was increased \$12,000. Likewise, the carryforward from year one was moved to supplies. It is anticipated that this will occur next year as well.

Contractual

Note regarding change from original budget: In the original budget, the costs for creating the State of STEM report were budgeted under contractual. Instead, the costs were accrued in supplies. The report was still created by faculty, and involved faculty and student participation throughout. Consequently, the actual budget for contractual was reduced \$12,000, and the actual budget for supplies was increased \$12,000. Likewise, the carryforward from year one was moved to supplies. It is anticipated that this will occur next year as well.

Budget Narrative

The STCC's carryforward from Year One was \$111,974.21. This funding was utilized to offer STEM Summer events year-round, and to get caught up on the State of STEM Report.

The Year Two STCC budget allocation was \$520,692. Combined with the carryforward from Year One, this created an available balance of \$632,666.21. In Year Two, the STCC expended \$614,431.63.

This leaves a carryforward from Year Two of \$18,234.58. This carryforward will be used to expand STEM Summer offerings, specifically designed to reach first and second year students. These costs will fall primarily in SUPPLIES and OTHER budget lines.