# STOCKTON UNIVERSITY
# ANNUAL REPORT FOR
# 2020 INITIATIVES PROJECT

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| **PROJECT LEADER(S):** | Peter Straub and Claudine Keenan |
| **PROJECT TITLE:** | Stockton STEM Collaborative: Pipelines to Success |
| **DATE:** | 7/27/2018 |
| **CC:** | |

- *The boxes below expand as needed to accommodate your notes. You may also include/submit appendices or attachments, if needed.*
- *Email a copy of this completed form to Jessica Kay, Data Analyst & Assistant to the Chief Planning Officer at: **jessica.kay@stockton.edu***

**Please provide a summary of the project and your experience.**

The Stockton STEM Collaborative was formed to promote cooperation between groups fostering Science Technology, Engineering and Mathematics (STEM) and STEAM (STEM with Arts) programs across Stockton University. Toward this end the project has recruited faculty associates, recruited a faculty fellow (David Furgione), funded and run a small STEM grants funding competition, funded a number of requested STEM events, developed a 3-D printer STEM makerspace, supported the Student Spaceflight Experiments Project, ARHU-STEAM events, Teen Tech, the Summer Enrichment Academy at Stockton, Tech Trek, the Jersey Shore Science Fair, and Stockton Center for Community Engagement K-12 Science field trips to Stockton and the Atlantic County Sea Perch K-12 robotics challenge.

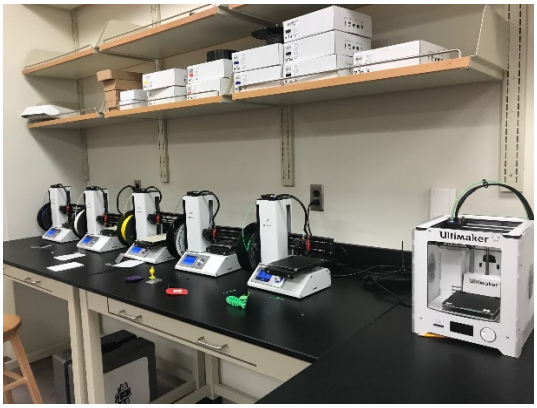
**Please attach a copy of your original proposal or list your stated objectives and expected outcomes.**

1. Promote collaboration and sharing of STEM/STEAM education resources across the University. (Foster an interactive environment among students, faculty, staff and community (ER3)).
2. Increase the number of K-college pathways to STEM education for underserved populations. (Increase opportunities for interactions between internal and external communities (ER4)).
3. Collaborate with Admissions, EOF and FRST to improve recruitment and retention of under-represented populations in STEM fields. (Establish Stockton as an integral part of the identity of students, faculty, staff, alumni, and community members (S3)).
4. Coordinate funding opportunities to maximize successful grant seeking. (Establish additional revenue sources (RS1-E)).
5. Cross-market existing Stockton STEM programs (e.g. SEAS and Tech Trek residential camps, ONR Sea Perch and the Jersey Shore Science fair). (Create mutually reinforcing intellectual and co-curricular experiences (S5)).

**Please describe the results of your project and compare them to your original expectations.**

**Elaborate on how well your objectives were met and how they might have changed. Note any particular obstacles that may have prevented your achieving full satisfaction on desired outcomes.**

The STEM Collaborative continued to develop in FY 2018. Faculty fellow, David Furgione (Instructor of Biology part-time) set up the 3-D printer maker space and developed curriculum and activities to use the instruments for the summer programs, including the SEAS experience. He has done an amazing job of getting things up and running and adding this vital "engineering" component to our repertoire. To meet additional goals of the Collaborative, David has prioritized student recruitment, particularly as they relate to recruitment and retention of underserved populations in STEM at Stockton. In addition the Collaborative again ran a small grants program and funded four projects to engage STEM activities in the community. The Collaborative also supported student engagement in undergraduate STEM by funding part of the Mission 12 Student Spaceflight Experiments Program (SSEP) flight operations costs and also travel expenses for students to attend and present talks and posters at the SSEP National meeting in Washington D.C at the Smithsonian National Air and Space Museum. Other activities included support for joint projects with the Center for Community Engagement (Sea Perch and Extreme Science), residential K-12 enrichment camps (SEAS and Tech Trek) and the Jersey Shore Science Fair.




STEM 3-D Printer /makerspace in USC.

**Please list any follow-up actions (publications, presentation venues, etc.)**

1. Continued to support a STEM maker space including five BuildTak IIP 3-D Printers, an Ultimaker 2 Go 3-D and a ROBO- 3-d printer as well as a selection of printing filaments for all types of applications. This space is in part of a Storage area of USC-1 suitable for training activities. This maker space was used by the 2018 Science Enrichment at Stockton (SEAS) summer residential camp for 15 (most economically disadvantaged) high school juniors as well as served our STEM Collaborative club activities run by Faculty Fellow David Furgione.
2. STEM Collaborative Club/Student Associates. Faculty Fellow David Furgione recruited 21 students to participate in STEM Collaborative activities including staffing the Maker Space, and assisting with camps and K-12 activities.
3. Assistance for 2018 Jersey Shore Science fair (in kind).
4. Assistance- Stockton Center for Community Engagement- 2018 Extreme Science- K-12 science activities (STEM badge/microcircuits). Tara Luke.
5. Supported- Atlantic County Sea Perch K-12 2018 underwater robotics kickoff at the AC Aquarium. Tara Luke, Cheryl Vaughn-Jones: NAMS and Stockton Center for Community Engagement ($275)
6. Supported 2018 flight operations costs of $3000 for the Mission 12 Stockton Student Spaceflight Experiments Program
7. Supported Student Spaceflight Experiments Program- student travel to Washington D.C. SSEP National Conference (6/28-29, 2018) to present papers: *The Effects of Microgravity on*

*Endomycorrhizae*, Flight Experiment- Mission 11 to ISS: Danielle Ertz, Valkyrie Falciani, Hannah Sandler, Francisca Ekekwe, Ariel Petchel, Chedecia Low, Megan Pierce with mentor Dr. Tara Luke; and *The Effects of Microgravity on PGMA Based Self-Assembly and Impacts on Drug Delivery Systems* Flight Experiment, Mission 12 to ISS, Daniel Schneider, Christina Tallone, Chioma Uka with mentor Dr. Pamela Cohn. ($3224.51 student travel)

8. STEM Small Grant Support- Dr. Anna Pfeiffer-Herbert, (NAMS) "STEM Collaborative Grant to Support Participation in Regional Competition of the National Ocean Sciences Bowl" ($500). Participation in the Shore Bowl, a regional competition of the National Ocean Sciences Bowl hosted at Rutgers University-New Brunswick. This is marine science themed quiz competition for high school teams, which has a mission of raising awareness of ocean research, technology and sustainability. Five undergraduate students from the Stockton Marine Science program participated as volunteer judges and I served as a chief science judge. Approximately 80 students and 20 teachers from 10 high schools took part in the competition
9. STEM Small Grant Support- Dr. Norma Boakes (EDUC), "Origami STEAM- Motivating Design Thinking Through Origami Art in Middle School Science" ($450). This funding provided the materials and resources needed to implement an Origami STEAM program with three groups of 6th grade students (45 total) at Roland Rogers Elementary School, Galloway NJ.
10. STEM Small Grant Support- Dr. Tara Harmer Luke (NAMS) "STEM Badge Workshop Supplies for Extreme Science 2018" ($500). Badges used for teaching circuit design and coding.
11. STEM Small Grant Support- Dr. Kelly Keenan (NAMS) "Advanced Placement Biology Prep Event" ($495). The event supported AP Biology Prep event that was held at Stockton University on March 24, 2018. Students from AP Biology classes at seven local high schools were invited to attend and there were students from 3 high schools.
12. 2017 STEM Small Grants Outcomes- ***EYE STEM- Engaging Youth in Experiential STEM learning opportunities***. **Boakes, N.** (2017). Engaging diverse youth in experiential STEM learning: A university and high school partnership. *Proceedings of the American Education Research Association*, 2018 Annual Meeting, New York, NY.
13. Assistance for 2018 Science Enrichment Academy at Stockton- 2- week residential STEM experience for rising high school seniors with an emphasis on recruitment to STEM disciplines of underserved populations. Collaborative member Dawn Watkins (SOBL) was again particularly helpful with recruitment again this year (in kind, 3-D printer lab).
14. Assistance for Tech Trek- Stockton/EDUC-AAUW-one- week residential STEM experience for middle school young women (in kind, lab support, collaborative member time, Dr. Claudine Keenan).
15. Assistance -Yale University Bouchard Society undergraduate travel and research experience- Provost Diversity Initiative- Dr. Elizabeth Pollock.
16. Grant identification-received commitment from NJ Space grant Consortium for $4000 for Student Spaceflight Experiments Program Mission 13 in 2018/2019.
17. Grants: The Math Science Partnership- Patty Weeks SRI/ETTC and Kim Lebak included the STEM Collaborative as partners on their successful grant to the department of education to provide training in next-gen science standards for the local K-12 community- continued 2018.
18. SSEP Mission 12 Patch design competition- Dr. Norma Boakes- engaged 488 K-12 students in art competition to design mission patches for SSEP Mission 12.

**Are you recommending the continuation of this project? If so:**

- **What are the next action steps you foresee or recommend?**
- **What are the expected budget requirements going forward?**
- **Please identify the program, department, or division to which the continuation proposal should be forwarded.**

*[Note: continuation proposals must be approved and incorporated into the appropriate budget process.]*

These 2020 project is complete but the Collaborative members will continue to develop additional strategies to sustain the progress made so far including grant writing and support from EDU, NAMS and ARHU.

| **FINANCES: Based on your proposal, please outline below how the award has been spent.** | | |
|---|---|---|
| | **Amount** | **Notes/Comments** |
| **Beginning Budget Balance as of:** | **$ 29000** | **FY17 (15K) FY 18 (13K)** |
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| Salary Expenditures | | |
| • Stipends | $ 6000 | David Furgione STEM Faculty fellow |
| • Full-time staff salaries | $ | |
| • Full-time faculty salaries | $ | |
| • TES salaries | $ | |
| • Fringe Benefits | $ | |
| **Total Salary and Fringe Expenditures** | $ 6000 | |
| | | |
| Non-Salary Expenditures *(supplies, travel, etc.)* | | |
| • Educational supplies | $ 1220.72 | STEM grants projects |
| • Other supplies | $ | |
| • subscriptions | $ | |
| • meetings and conferences | $ 3224.51 | Student conference |
| • Student Spaceflight Operational | $ 3000.00 | Student Spaceflight support |
| • | $ | |
| **Total Non-Salary Expenditures** | $ 7443.23 | |
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| **Total Salary + Non-Salary Expenditures** | **$ 14890.99** | |
| | | |
| **Ending Budget Balance as of:** | **$ 663.77** | |

***If there are remaining expenditures required to complete the project, please itemize them with expected amounts and timing for payment.***

| ***IMPORTANT:*** ***Unused funds will revert to the general 2020 Initiative Fund at the end of the fiscal year if not approved and encumbered for project costs.*** | | |
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| **Item** | **Expected Amount** | **Expected Timing for Payment** |
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| **Total** | | |