SUBGRANT REPORT

State Project Code: *2013-ABC-101*

Project Period: January 1, 2014 – July 30, 2014

State Goal: Improving access to lifelong learning opportunities

INSTITUTION INFORMATION

1. Submitting Library: Watertown Public Library
2. D-U-N-S® Number: 11-123-8951
3. Street or P.O. Box: 201 E. Pier St. Northwest Dakota, WD 60901-3864

PROJECT DIRECTOR INFORMATION

4. Name of Project Director: Ms. Helen Heller
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PROJECT INFORMATION

8. **Title:** STEAM Afterschool Programs for Underserved Youth
9. **Project Abstract:** STEAM provided mentoring, technology training, and out-of-school science education for twenty at-risk youth, ages 13-17. Students constructed solar water heaters and parabolic solar collectors; recorded the making of their solar-powered devices and produced how-to videos; co-designed and constructed tiny homes for homeless adults as part of a larger school-wide volunteer effort; and participated in a creative writing and arts workshop that focused on remixing and reimagining science concepts. High school students that participated in this program demonstrated improvement in test scores as compared to non-participants; gains in knowledge about STEM careers; gains in 21st century skills, including communication, teamwork, and analytical thinking; and willingness to pursue a college degree in a STEM field.
10. **Project Results:**

    Evaluations done by an external reviewer at the beginning and end of the 6-month program through surveys, focus groups, and interviews showed that students had increased interest in science and math and increased confidence in their ability to pursue these subjects. This program found ways to increase interest in STEM by providing youth with engaging curriculum that sparked their curiosity; promoted teamwork; incorporated design theory; and had a strong

mentorship component that exposed youth to various career opportunities through interaction with STEM professionals.

18 of 20 youth completed the program's pre- and post- surveys.

- 95% reported increased self-confidence and 70% had an increased motivation to do well in school.
- 92% reported they want to learn more about science and technology as a result of their participation in the program.
- 90% reported an increased understanding of the role of science and technology in everyday life.
- 85% reported an increased interest in science and technology generally and
- 70% had an increased interest in STEM careers.
- 65% reported that they enjoy math and science projects in school more than before their participation in the program.

	Percent who answered YES	
Survey Item	**Before**	**After**
I am good in math	45%	85%
I am smart (intelligent)	30%	100%
I like to discover things (or invent things)	55%	100%
I like to design things (or build things)	35%	100%
I know what a scientist does	45%	98%

11. Data Collection Methods

An external evaluator distributed pre- and post- surveys to all youth participants and pre- and post- customer satisfaction surveys to mentors. The evaluator also conducted one-on-one interviews with each of the participants before and after the program. The program coordinator tracked out-of-classroom hours using a sign-in and sign-out sheet.

12. Significant Lessons Learned

This year, we deployed a team mentoring approach and asked mentors to meet with groups of 6-8 students at their school or on the local university's campus. We recruited students from the local university in the Natural Sciences departments to serve as mentors. We believe that this partnership between the Watertown Library, Watertown High School, and Watertown State University proved to be highly successful in creating diverse adult mentor teams consisting of librarians, teachers, and university students. Throughout the 8-month program, one adult was available per week to deliver programming. Also, university students were able to earn community service/internship credits that counted towards their general education requirements.

13. Other Observations

In addition to limited exposure to out-of-school academic enrichment activities, a majority of youth in this program also experienced challenges related to access to healthy foods. The Library used state funds to purchase healthy snacks for the teens and meals to celebrate the culmination of a learning module or program.

Update: 2 students were accepted at the state's flagship university with full scholarships. 12 of the 18 students in the program (2 students did not complete the entire program) applied to either community colleges or state universities.

14. Keywords: teens, rural, science

15. Project URL: http://gph.is/1N9t3ML

16. Actual Expenditures:

	LSTA	**SLAA**	**Private**
Salaries/Wages/Benefits	65,000		
Description: 1 full-time librarian (LSTA-funded); 12 mentors			
Consultant Fees	5,000		35,000
Description: Engineering and construction professionals; private funds were used to hire an independent evaluator.			
Travel	5,000		
Description: Transport to and from educational sites.			
Supplies/Materials	35,000	300	10,000
Description: Tools and supplies to construct solar devices; tools, materials, and supplies to construct 4 moveable structures; supplies for exhibit materials.			
Equipment			
Description:			
Services			
Description:			
TOTAL	110,000	300.00	45,000

17. Project Activities

Session 1 – BUILDING TINY HOMES FOR HOMELESS ADULTS

This 16-week program (January 3 – April 3) paired 18 students with a team of engineering, architecture, and construction professionals to build a moveable "eco-village" for a homeless community in West Dakota. On average, students met once per week for an average of 1.5 hours.

In collaboration with the Jack Hammer Cooperative, a local nonprofit, teens built personal and secure shelters for residents to sleep, a solar power hub that will allow for lighting and warm water at night, composting latrines and a community cook space. Students learned design theory and basic carpentry skills. They also increased their understanding of renewable technology, such as smart heating systems and photovoltaic systems that produce solar power. Together with two electrical engineers, the students installed power systems and learned how to produce and interpret technical drawings. As a result of this program, 12 homeless individuals have access to moveable and secure housing.

Session 2 – ODE TO WATER

This 8-week program (May 1 – July 1) paired 18 students with 10 university students studying environmental science, communications and fine arts (sculpture, new media, and painting) and resulted in an exhibit at the Watertown Public Library's Exhibition Room (reserved for rotating exhibits). On average, students met once per week for an average of 1.5 hours.

The purpose of the program was to blend science, technology, engineering, and art. Together with their university mentors, students explored topics related to water resources, such as water properties, water quality, water use, and saltwater intrusion. Students produced sculptures, video shorts, computer games, and poetry. These works were on display beginning June 30, 2014.

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