Front Cover

Title of the program and its location

STEMworks™ AFTERschool™
Maui Economic Development Board
1305 N. Holopono St, Suite 1
Kihei, HI 96753

Name of the evaluator(s)
Shawna Sodersten

Period covered by the report
June 1st, 2015 to May 31st, 2016

Date the report is submitted
Dec 21st, 2016

**STEMworks™ is an original trademarked program of Maui Economic Development Board's Women in Technology Project.*

Executive Summary

The following report details the evaluation of the STEMworks™ AFTERschool™ 21st Century Community Learning Center program during the 2015-2016 school year at Iao Intermediate School (Iao), Lanai High and Elementary School (LHES), Lahaina Intermediate School (LIS), and Maui Waena Intermediate School (also serving students from St. Anthony's School, MWIS). The program was evaluated primarily with regard to program outcomes: providing information regarding how well the program achieved its goals, and informing guidance for ongoing program development. The evaluation also served the secondary purpose of documenting the program's implementation.

The program has procedures in place to document implementation by collecting data regarding program attendance, coordination and communication between in-school and after-school staff, contact and communication with parents, community outreach efforts, and curricula. The evaluation used data from survey instruments and both formal and informal observation tools, that gathered feedback from teachers, students, staff, parents, and community members regarding their experience of the program and its impacts; student performance in math, science, reading, and development in an array of core skills; student behavior; student perceptions and goals in STEM; and student development of leadership and teamwork skills.

The evaluation concludes that the program effectively engaged the intended participants. The bulk of program participants were in intermediate school: 107 6th graders, 81 7th graders, and 60 8th graders. The program also reached two high school students and 39 elementary school students.

STEMworks™ AFTERschool™ is a multi-faceted, hands-on program where students access enrichment activities based in the most current, high-end technologies applied to community service learning projects. Students in STEMworks™ AFTERschool™ are challenged to be self-directed, responsible individuals while developing the skills to navigate building collaborative professional and community relationships. All activities are student centered, creating an environment where teachers become facilitators, navigating student learning through community based and culturally relevant projects that integrate technology to solve problems.

All sites provided academic tutoring on an individual student basis to support success in core subjects, including math and science education and reading. In addition, each site offered an array of family engagement activities through parent night events. The program excelled at involving community partners (private business; federal, state, and county government, institutions of higher learning) and generating in-kind donations of personnel hours and software.

Based on the self-reporting of students, program participants at all sites benefitted in the following areas: math, science, reading, creativity, learning and using technology, communication and confidence. Students at the MWIS program also widely reported benefits in leadership, perseverance, research skills, logical reasoning, presenting skills, and writing.

The program is meeting or exceeding expectations for improving student performance in the areas of classroom participation and turning in homework on time. At LHES and LIS, teachers also reported that most students showed improvements in attendance and classroom behavior.

More information is needed to assess the program's effectiveness at improving students' school day performance in core subjects. The program experienced challenges at some schools in securing waivers, which resulted in insufficient data to reach firm conclusions regarding the effectiveness of the program in improving student performance during the school day in math, reading and language arts. The available data suggests that more than half of participating students experienced improvement in these subject areas.

To improve data collection, the report recommends that each site dedicate a few staff hours each week to record-keeping and checking in with parents and students for documentation. Follow up by the Project Director is recommended to reinforce that these hours be used in this fashion, and to promote understanding that the record-keeping is necessary and useful in communicating results to funders and in informing the continuous improvement of the program

The report further suggests that each site: Adopt and implement a policy of inviting students to participate for a limited number of introductory days, but then require completed initial paperwork in order to participate; follow up using the WIT-created "missing waiver & survey" packets with a letter about the program and meet parents as they pick up students with missing paperwork; and use family nights as an additional opportunity to locate parents who need to complete waivers for their students.

To support student improvement in math, reading, and language arts, it is recommended that the Project Director:

- Explore staffing solutions with each site, such as the use of a Curriculum Coordinator and Educational Assistants, in addition to Site Coordinators and Instructors, to ensure a focus on these improvements and bridges to the school day curriculum.
- Consider seeking to ensure representation of math and language arts backgrounds within the general goal of hiring staff from a diversity of background disciplines
- Inquire directly with the math and language arts teachers at each site regarding how the program might further support improvements in these subjects during the school day. This may include expanding the time dedicated to tutoring or homework completion.

To support continuous improvement and ensure program quality, it is recommended that:

- The program continues to implement its evaluation plan as structured.
- Continue sharing summarized data from survey instruments with all staff from the respective site during informal site visits so that this information can shape the program and its delivery, including by further revising data collection instruments to best serve the goals of the grant and the individual sites

Program Description

A. Origin of the program

This program originated with a 2015 21st Century CCLC grant to the Maui Economic Development Board (MEDB), for implementation by MEDB's Women in Technology Project (WIT). The program was initially designed to serve four school sites: Maui Waena Intermediate, Iao Intermediate, Lahaina Intermediate, and Lanai High and Elementary, with a combined student population of 3,100. The program also includes additional outreach to a geographically proximate private school, St. Anthony's with an intermediate population of 88 students. The program launch was originally proposed for spring of 2015, but funds were not issued to the program until June 2015. Consequently, the program did not launch until fall of 2015.

B. Goals of the program

WIT staff interviewed teachers at each school about their interest in STEM-related afterschool programming. All schools expressed strong interest in programming based on WIT's proven STEMworks™ approach. In addition, teachers requested curricula geared towards coding, digital media, geospatial technology, and robotics.

The teachers' identified areas for programming focus align with MEDB's research on community economic development needs, and with national research regarding the importance of stimulating interest in STEM careers from the middle school level with hands-on, real-world, locally relevant, group/team-based learning.

There is nothing else within the school-to-workforce pipeline available to the majority of these students with regard to computer science. This program was designed to adapt WIT's proven STEMworks™ program to serve these middle school students in an afterschool setting at the four target schools, with a curricular focus on robotics, coding, GIS, and digital media. The program addresses the need to stimulate interest and skills in science and math and support students in continuing with this interest into their high school and post-secondary education, as well as preparing them to meet the workforce needs of their communities in viable careers. The program is intended to promote the acquisition of self-directed learning skills that will serve participants throughout their working lives as they must adjust to the rapidly changing technology landscape of their future.

The STEMworks™ curriculum supports the application of design thinking to a service-learning project and provides a context where students can integrate learning: 1) about their communities, 2) the impact and practical applications of science, technology, engineering, and mathematics, 3) the importance of developing effective professional skills (i.e. teamwork and leadership, oral and written communication) and 4) the possibilities of STEM careers and future internship opportunities.

The project uses the afterschool program to enhance in-school efforts to promote achievement in math, science, and reading, and academic skills (like homework completion and class participation); to sustain the successes of these schools regarding attendance and behavior; to

generate awareness among students and their parents about the STEM-related career opportunities in their community and the educational pathways to entry; to generate interest in these careers, which are vital to the economic development of their community; and to create and strengthen family-school engagement.

The original evaluation plan was set to measure progress towards the following concrete goals:

1. Academic Achievement Goal 1: Program participants will achieve measurable improvement in Language Arts and Mathematics. The evaluation will also track student interest in STEM education and careers, and increased ability/practice in the engineering design process.
2. Academic Achievement Goal 2: Program participants will show measurable improvement in self-efficacy, social skills, and ethical responsibility via finishing the academic year (75%), expressing confidence in their abilities to complete tasks and achieve goals (95%), demonstrating an ability to work well and collaborate with others on a team (95%), recognizing and acting on their responsibility to their team and community (95%), and attending school (95% attendance rate). Through end of year teacher surveys, the evaluation will also track class participation, behavior, and homework completion.
3. Family Participation Goal: The families of program participants will engage in program activities and support the success of their children, measured via participation in program activities (70%), and engagement with student progress (70%).

C. Clients involved in the program:

Risk factors present within the population of students attending the three target intermediate and one elementary through high school (on Lanai) include English language-learning, low-income and low educational-attainment households. Data from the U.S. Census Bureau's American FactFinder 1008-2012 American Community Survey 5-Year Estimates report indicates that, in all but one of these communities, fewer than half of the population has attained a Bachelor's degree or higher, and in many cases, fewer than one quarter of the population has this degree of educational attainment.

The bulk of program participants were in intermediate school: 107 6th graders, 81 7th graders, and 60 8th graders. The program also reached two high school students and 39 elementary school students.

Specific Program Demographics:

	FRPL	EL	SPED	Female	Male
Maui Waena	20	3	5	87	55
Iao	28	3	18	16	41
Lahaina	20	0	0	13	36
Lanai	19	0	1	25	30
Total	87	6	24	141	162

Program Attendance:

	School Year	Summer (5/31/16 to 7/29/16)
Maui Waena	8-17-15 to 5-27-16 142 students (30 from St. Anthony's), 71 adults	58 students
Iao	9-21-15 to 5-13-16 57 students, 33 adults	
Lahaina	8-24-15 to 5-20-16 49 students, 52 adults	
Lanai	9-30-15 to 5-27-16 55 students, 71 adults	8 students
Total	303 students, 227 adults	66 students

D. Characteristics of the program materials and resources:

STEMworks™ AFTERschool™ is a multi-faceted, hands-on program where students get to use the most current, high-end technologies applied to community service learning projects. Students in STEMworks™ AFTERschool™ are challenged to be self-directed, responsible individuals while developing the skills to navigate building collaborative professional and community relationships. All activities are student centered, creating an environment where teachers become facilitators, navigating student learning through community based and culturally relevant projects that integrate technology to solve problems. All sites also support academic tutoring on an individual student basis.

The program was announced to the public on May 26, 2015 via email to the identified program teachers and principals at each of the four sites, plus St. Anthony. This email announcement contained a program flyer to be distributed to students and families prior to the end of the 2014-2015 school year. The program flyer included a link to a website for a survey sign-up in addition to phone and email contacts. The email also explained that there would be future family nights at each site where parents would find out more information specific to each site's programs. On July 15, 2015 "This is more than an AFTERschool Science Club" article was published in the Maui News in order to announce the program to the public and community. The article contained afterschool program highlights, the four school sites, and contact information. Parent engagement began with a preview of program offerings via the flyer and Maui News article.

MATERIALS

Site Supply Summary for STEMworks AFTERschool purchased during the 15-16 program year:

Lanai High & Elementary
Digital Media: Cameras, Camcorders, Color Printer
Robotics & Programming: Littlebits and Arduino kits
iPads & cases

Computers: Set of Laptops
Drones: Phantom 3, drone parts (such as batteries, motors, propellers), repair toolkits
Securing supplies: Combination Locks

Note: Leveraged funding and partnership were utilized during program year 1 at LHES, which provided students with access laptops and CS6 and ESRI software.

Maui Waena Intermediate
Digital Media Computers: Set of MacBooks and iMacs, Apple TV, adapter, and mice
iPads with case
Robotics: VEX and VEX IQ kits (foundation, add-on, booster, and super kits)

Note: Considerable leveraged funding was utilized during program year 1 at Maui Waena, which provided students with access to CS6 software, cameras, camcorders, tripods, iMacs and MacBooks.

Lahaina Intermediate
Digital Media: Cameras, video mic sets, tripods, SD cards
CAD and 3-D Printing: 3-D printer, Solidworks software, filament
Robotics: VEX IQ Starter Kits, Littlebits coding and home energy kits
Parts and tools for building Computer server to host & program, Minecraft EDU accounts

Note: Leveraged funding was utilized during program year 1 at LIS, which provided students with access to CS6 software and laptops.

Iao Intermediate
Securing Supplies: Filing Cabinet w/Drawers
Server: Parts for Hosting and Programming, Minecraft EDU accounts
Digital Media Supplies: Macbook, laptops, Shortcut keyboard covers, camera, SD card, mice
iPads with Covers
Robotics: VEX Kits: Super, Booster, Challenge, Add-ons, motors

Note: Iao's classroom did not have any storage or way of securing supplies, thus a locking filing cabinet was purchased to store technology. Leveraged funding and partnerships were utilized during program year 1 at IAO, which provided students with access to CS6 software and Macbooks. All of IAO's supplies were transitioned to MWIS or LIS during the summer of 2016)

RESOURCES:

Grant Funds: The program expended its entire budget of $200,000 in grant funds.

In-Kind Donations:

Software: 100 seats each of ESRI ($2500) and Sketch Up ($1500)

Volunteer hours:

- (24 hours) Cyber Security (UH) – STEM Conference (for LIS)
- (4 hours) AMOS connection to UH IFA (institute for astronomy) & AFRL – (for MWIS, IAO and LIS)
- (4 hours) IGED tours at Maui Electric to meet female (& male) engineers and learn about circuitry with hands-on activity – (for girls from LIS, LHES, Iao, MWIS)
- (6 hours) Maui High First Robotics Team (VEX Robotics) – 6 students & 2 teachers and counselors presented at Iao and MWIS family nights
- (8 hours) Maui High School VEX competitions – (LIS, Iao attended)
- (50 hours) Hawaii Drone Services - CEO teaches drone class LHES, during STEM Conference, connections were made with other sites (now in 16-17 Lokelani, MWIS, LHES, Pukalani and LIS are integrating drones)
- (3 hours) Brown & Cadwell Engineer spoke for families (for LIS)
- (2 hours) Maui Makers - (for LIS)
- (3 hours) Fung Bros– company that broadcasts on YouTube critiqued MWIs student videos and gave advice for filming (for MWIS)
- (48 hours each) 2 High School volunteers at Iao

Physical Facilities: MWIS (2 rooms, 5 days a week), LIS (2 rooms, 3 days a week), Iao (2 rooms, 4 days a week), LHES (2 rooms, 4 days a week)

ACTIVITIES FOR PROGRAM PARTICIPANTS

Sites	Days of operation	Hours of operation	Programs offered
Iao Intermediate 260 S. Market St. Wailuku, HI 96793	M, Tu, Th, F	12 hours (2:15-5:15pm)	Coding, Programming & Minecraft Servers Robotics Digital Media – music & video, motion stop animation Bottle rockets
Lahaina Intermediate 871 Lahainaluna Road Lahaina, HI 96761	M, Tu, Th	9 hours (2:20-5:20)	Math & English tutoring Computer construction Programming & Minecraft Servers Desktop publishing Digital Storytelling CAD/CAM – 3-D printing Robotics Broadcasting
Maui Waena Intermediate 795 Onehee Ave. Kahului, HI 96732	M, Tu, W, Th, F	16.75 hours (M, Tu, Th, F-2-5pm) (W- 1:15-6)	Digital Media- PSA, Photoshop, After effects Agriculture Computer Science (variety of software including coding, website building, google classroom)

(St. Anthony Students Attend)			
Lanai High and Elementary 555 Fraser Ave. Lanai City, HI 96763	M, Tu, W, Th	15.5 hours (M, F: 2-4) (Tu, W: 2-4:30) (Th: 2-3:30)	sUAS (design, build, fly, augmented reality) GIS, Cyber-security Digital Media (Photoshop and videography) Robotics Coding Khan academy- (math supports) Academic Support

STAFF PROCEDURES AND PROGRAM ADMINISTRATION

A. Maui Waena Intermediate School (MWIS)

Students from both Maui Waena and St. Anthony School collaboratively explore many opportunities being offered throughout the week, students are also able to fluidly move between course offerings including: Digital Media, Agriculture, and Computer Science. In digital media, students work on community based and culturally relevant PSA's using a variety of programs including after effects and filming techniques for local and national competitions, daily student news broadcasts, and premiere their short films with families. In agriculture, students practice organically growing and harvesting crops, building topsoil through growing organic nutrient fertilizer, nutrient soil monitoring and organic pest control methods. Digital Media and Agriculture work collaboratively to create how-to videos that document organic agriculture methods as well as health topics. Agriculture fosters entrepreneurship and economics in farming; students document growth & production costs. In computer science, students learn and apply coding and programming skills. Students build websites, research and produce content to raise awareness about topics that students are passionate about in their communities. In March, student representatives attended the national STN (Student TV Network) Conference and won eight awards from their productions in digital media videography!

All students and facilitators check in with Site coordinator who attends students and gives overall announcements. Then facilitators disperse into course classrooms or garden with students. Agriculture, Digital Media, and Computer Science. When St. Anthony students arrive, they check in to attend with site coordinator and receive pertinent announcements, and then attend their given course. Educational assistants support facilitators and coordinator as needed (usually extra support is needed in agriculture and digital media). Due to high student numbers in digital media, more than one facilitator support students, and also pulls small groups for mini-lessons based on student need. Most activities take place 4 to 5 days a week.

B. Lahaina Intermediate School (LIS)

At Lahaina Intermediate, students have the option to explore many opportunities being offered throughout the week. As each month progresses, the depth and breadth of students' skills and knowledge grows; teachers facilitate the expansion of learning opportunities with new technologies. With each new skill, students are able to fluidly explore and move between course offerings which include: computer construction, coding and programming- which includes

programming and building a Minecraft server, digital media- including PSA school broadcasting, photography and website building; 3-D design/modeling with a variety of CAD & CAM software leads to prototyping with 3-D printing. With support from their teachers and a hands-on presentation with Maui Makers, students were able to design and print many items, including printing props that were used in the ProArts Playhouse production of "And Then There Were None." Students also designed VEX robots and competed in the middle school VEX robotics state competition on Oahu! During parent engagement evenings, students presented their projects and practiced professional skills. During a career focused family engagement evening, families had the opportunity to learn from a past female LIS graduate, who not only was taught by one of the current site facilitators, but who now works locally as an Environmental Engineer at Brown and Cadwell!

LIS uses a co-teaching model where all students gather together for announcements and projects in one classroom and each facilitator pulls small student groups for mini-lessons based on student needs and areas of interest. Mini-lessons may take place in the same room at the same time, and sometimes another classroom is used if students needs more space (such as a quiet space for filming). For example, one teacher may give a mini lesson on the next steps using CAD while the other facilitators may support students in digital media techniques. Students attend mini-lessons based on their current project need and area of interest. Both the site coordinator and the instructor co-teach all classes three days a week.

C. Iao Intermediate School (Iao)

At Iao Intermediate, students engaged with technologies on a rotating basis as they built skills each quarter. Students explored engineering design and competed in VEX IQ robotics competitions- earning an award for Sportsmanship in December! Students posted informational short films on YouTube and created stop-motion animation films via digital media during a three-day parent, teacher, and student workshop from Royer Studios! Over the course of the year, students built their coding and JAVA programming skills using a variety of programs including code.org, Scratch and Minecraft servers; during Quarter 3, skills were supported by the mentorship of two high school students who have taught JAVA programming for several workshops (for teachers and students sponsored by Women in Technology).

Iao uses a co-teaching model where all students gather together for announcements and projects in one classroom and each facilitator pulls small student groups for mini-lessons based on student needs and areas of interest. Much like LIS, two classrooms are alternatively used based on activity need. Both the site coordinator and the instructor co-teach all classes four to five days a week.

D. Lanai High and Elementary School (LHES)

At LHES, students engaged in many opportunities being offered throughout the week, high school students have opportunities to mentor younger middle and elementary students, and parents are encouraged to learn alongside their children in several afterschool program offerings. Students build skills in sUAS (drones) by exploring regulation, safety, augmented reality, piloting, and use CAD to plan and build sUAS while using STEMworks™ CAD and drone

engineering design curriculum. Students engage with the community through documenting community relevant landmarks and issues using GIS software. In coding classes, students develop skills towards game and app design using a variety of software. Digital media offers opportunities to hone Photoshop skills. Cybersecurity classes built student skills that are relevant to fast growing STEM careers. By parent request through family engagement evening collaborations with families, support in academics and elementary technology fluency has led to the addition of a Khan Academy math and typing fluency class.

LHES has a schedule where different classes meet on different days. At LHES the site coordinator both runs a regular class once a week and checks in with other classes throughout the week. These check-ins by the site coordinator are flexible, and often by request from instructors in order to co-teach or provide any additional support as needed.

All sites meet as a whole team at least once a quarter and have a site visit by the project director at least once a semester, but often more. All site coordinators and instructors support during family engagement evenings as well. Throughout the year, the Project Director works with each site, conducting program planning and implementation meetings (both site-specific and center-wide), site visits and supply inventories, grant review meetings

Women in Technology provides a vast amount of professional development for teachers- such as, but not limited to STEMworks (PDE3 course), Island energy Inquiry (PDE3 course), GIS training and curriculum for ESRI, and CAD/drone curriculum and workshops. Women in Technology's STEMworks AFTERschool program directors and site staff teachers are always looking to offer cutting edge engagement opportunities to students in order to build career readiness skills. Thus, additional funding enables a staff cohort to travel to ISTE in the summer of 2016, which is the premiere educational technology conference. Content learned in ISTE sessions will be implemented in future years of the STEMworks AFTERschool program, with plans to also integrate topics into their school day classrooms as well.

E. Staff and others involved in the program:

Title: Project Director
Number on staff: 1
Hours: 15 to 30 hours per week to support sites through phone/email communication and site visits, program planning for events and family engagements, documenting activities, analyzing and summarizing data, and writing final reports on program activities.

Roles: Regular communication and support in record-keeping. Ensure timely communication and reminders to Site Coordinators regarding student attendance data, survey data, and self-assessment measures being completed. Provide professional development and training to all Site Coordinators to ensure adequate understanding of the processes and measures. Disseminate and collect school partner and community partner surveys. Participate in the program improvement meeting each year and in the identification of areas for improvement and development of associated strategies. Solicit feedback from site coordinators and consult with the external evaluator to understand contextual issues that might impact data or reporting. Work with the Site Coordinators to collect and handle data in a confidential way, adhering to Family and

Educational Rights and Privacy Act guidelines. Maintain and enter data to state and federal systems as required.

Title: Site Coordinator
Number on staff: 4
Hours: Weekly hours at MWIS, Iao, and LIS; averaging between 9 to 16 hours per week. At LHES, the Site Coordinator covered their class and overlaps with other courses to co-teach and support as needed, averaging about 5 hours per week.

Roles: Instructional and program planning; maintain accurate and clear attendance records for every student served, disseminate and collect evaluation surveys (teacher, parent, student), participate in the program improvement meetings each year and support identification of areas for improvement and development of associated strategies. Site Coordinators use the STEMworks model during teaching. Site coordinators also interview staff in the programs to identify at least one student or family success story per year to share with the Project Director for inclusion in annual reporting. Site coordinators work with the Project Director in planning engaging community nights for both students and families to attend.

Title: Site Instructor
Number on staff: 10
Hours: Varied by course taught. Some instructors supported activities that met less frequently whereas others taught classes that met daily. Thus instructor hours varied between 4 to 16 hours per week.

Roles: Uses STEMworks model, attends at least two PD sessions offered by Women in Technology, attends STEM Conference. In charge of course program planning, implementation and facilitating the learning of students, supports site coordinator in monitoring student progress, attends all parent evenings. Aligns site program with student needs (skills and in-school standards), collaborates with Curriculum coordinator and uses feedback to improve project alignment to STEMworks model. Sessions may include academic support for in-school subject areas. Collects daily student attendance, supports site coordinator in collecting documentation, and distributing forms. Documents program through supporting with monthly project/curriculum summaries and photo-logs (images with descriptions). Supports in summarizing student success stories/student of the month. Maintains timely communication with Project Director.
Title: Educational Assistant
Number on staff: 2
Hours: 8-15 hours per week.

Roles: Assists program instructors & coordinators; assists all students in projects, supports students' critical thinking skills using the engineering design process to research, implement, edit, and revise work; may sub as needed for absent instructors; attends all parent evenings. Maintains timely communication with Project Director. May attend PD sessions offered by Women in Technology, invited to attend STEM Conference.

Title: Volunteer
Number on staff: 2

Roles: High school student or professional expert offering content support/guidance for students in STEMworks AFTERschool labs.

MEDB partners with a wide range of Hawaii-focused STEM companies, government entities, and educational institutions. These partnerships provide career exploration opportunities for students including: cultural teaching/alignment, e-mentorship from women in industry, career and college interest exploration including: GIS, IT, coding, emerging healthcare fields, robotics, clean energy, and astronomy. During the period covered by this report, these included:

- AMOS (connections to UH Institute for Astronomy and Air Force Research) – MWIS, IAO and LIS
- Introduce a Girl to Engineering Day tours at Maui Electric to meet female (& male) engineers and learn about circuitry with hands-on activity (February 2016) – girls from LHES, LIS, Iao, MWIS
- Maui High First Robotics team (VEX Robotics) - students & teachers presented at both Iao and MWIS family nights, LIS and Iao also attended VEX competitions
    - Maui High teachers, counselors, and students in pathways – Shared opportunities with MWIS families
- STN (Student TV Network) – Maui Waena Attended Conference (and two facilitators from STN taught week long workshops during summer 2016 at MWIS)
- Hawaii Drone Services - CEO teaches drone class LHES, during STEM Conference, connections were made with other sites, now in 16-17 Lokelani, MWIS, LHES, Pukalani and LIS are integrating drones
- Brown & Cadwell Engineer speak with families (LIS)
- Maui Makers led in-program workshop on using new 3-D printer (LIS)
- ecoQoob – Clean energy App creator company speaks with families (MWIS)
- Fung Bros (MWIS) – company that broadcasts on YouTube critiqued MWIS student videos and gave advice for filming
- Royer Studios – Motion Stop Animation workshop for families (MWIS)
- ProArts Playhouse – Students 3-D printed figurines for the set (LIS)

Hawaii STEM Conference (LIS, Iao, MWIS, LHES) – Students were taught by industry professionals in 2 days of breakout sessions, heard from keynote speakers, and had opportunities to ask professionals from questions in a 5x5 rotation session. Participating professionals came from more than 35 private companies, federal government (Air Force Research Laboratory, National Security Agency, NASA), state government (Pacific Disaster Center, Hawaii DOE, Hawaii Dept. of Aquatic Resources, Hawaii Energy Efficiency Program), county government (Maui District CTE, Maui Electric Company, Maui Institute of Art and Technology, Maui Invasive Species Committee, Maui Soil and Water Conservation Districts, Maui County Council) and higher education (Mount Mercy University, UH College of Engineering, UH Hilo Continuing Education, UH Maui College, UH Maui College-Career Link, UH STEM Pre-Academy, University of Hawaii, University of Hawaii Maui College).

Evaluation Design and Results

A. Purposes of the evaluation

The program is evaluated primarily with regard to program outcomes: providing information regarding how well the program is doing at achieving its goals, and guidance for ongoing program development. The evaluation also serves the secondary purpose of documenting the program's implementation.

B. Evaluation plan

The program has procedures in place to document implementation by collecting data regarding attendance (in-school and after-school), coordination and communication between in-school and after-school staff, contact and communication with parents, community outreach efforts, and curricula.

The evaluation plan includes survey instruments and observation tools, attached in the appendix to this report, to gather feedback from teachers, students, staff, parents, and community members regarding their experience of the program and its impacts; student performance in math, science, reading, and development in an array of core skills; student behavior; student perceptions and goals in STEM; and student development of leadership and teamwork skills.

Formal site observations are recorded on a summary sheet that is aligned with 21st CCLC program goals, and attached in the appendix to this report. The form captures acedotal data and verifies activities aligned with program goals. This formal monitoring is conducted at least once per quarter. The completed form is provided to each site, along with summaries regarding noted areas of excellence, areas for improvement, and areas for support.

Informal site visits occur between the formal site observations. These provide a venue for staff to voice their needs and suggest areas for improvement. Matters reviewed include program organization, data collection, staffing needs, supply inventory, orientation support on new supplies/software, meetings to align program with in-school courses and STEM, support with community connections or advice on projects and planning for parent engagement. Informal check-ins are also used to check in with program students, to ask what they are learning and working on in their projects. Informal site visits occur as often as needed, averaging about twice per quarter or more.

C. Evaluation Schedule

Tool	Lead	Month of Completion
Survey #1 (student and parent)	Site Coordinators	Quarter 1 (August- October)
Formal Site Observation	Project Director	1-2 in Semester 1
Quarter 1 Monitoring Call	Project Director	October
Program Staff Data Collection Review and Progress/ Improvement Meeting	All program staff	November/December
Fall semester student grades	Site Coordinators	December

Financial Record Review	Daniel Williams	January
Survey #2 (student)	Site Coordinators	February-March
Quarter 2 Monitoring Call	Project Director	December
Formal Site Observation	Project Director	1-2 in Semester 2
Site Observation Review	Daniel Williams	February
Success Stories	Site Coordinators	February
Quarter 3 Monitoring Call	Project Director	March
Program Year 1 Data Review & Year 2 Planning Meeting	Project Director (With Facilitators from all sites)	End of April
STEM Conference PIA (Program Impact Assessment)	Project Director (Students at sites present projects)	May 6-7
21st CCLC Teacher Survey	Math or LA teacher	May
Quarter 4 Monitoring Call	Project Director	May
School/Community Partner Surveys (begins year 2)	Project Director	Fall of 2016
Annual Report and summary for stakeholders from June 2, 2015 to June 3, 2016	Project Director & Program Evaluator	Ongoing data collection, Due December 21, 2016

D. Results of the implementation evaluation:

The implementation of the program has involved some changes from what was originally envisioned in the grant application, mostly in the arena of how to evaluate the impact of the program on students. The original plan was to use standardized test scores, but between the application and the release of funds, the system of testing changed, making this no longer a viable option. In addition, the federal government came out with more concrete and explicit guidance about what it wanted reported, and evaluation tools were adjusted accordingly.

The major program challenge was collecting waivers and survey data from parents and students. Many, and in some cases, over half of attending students showed up ready to participate in the program for weeks at a time without completing paperwork. Over the course of the year, a substantial number of these gaps were closed with persistence (many copies being sent home, meeting parents in the parking lot, and giving forms to parents during engagement evenings). However, missing waivers created gaps that appear as 'unknown data' in reporting. To improve during program year 2, students are invited for a limited number of days until they are required to have program paperwork to participate. This supported student interest by allowing students to try out the program long enough to bring the waiver back. WIT also made “missing waiver & survey” packets with a letter about the program and met parents as they picked up students. Records were also double-checked during family nights to locate parents who needed to complete waivers. This past year, the program had over 300 student participants, attending a variety of classes offered at the sites, creating difficulty in quick paperwork communication between facilitators and new students who joined mid-quarter.

In the fall of 2015 LHES had very few students attending. During a parent night, feedback from families for areas of focus led to course schedule changes, the program was also opened up to K-

12, which saw an influx of elementary students with high school students as mentors. The WIT team visited classrooms during the school day to talk about STEM careers and expose students to opportunities in the program, WIT team attended the LHES College and Career fair to expose students to the program, WIT team stopped by local businesses in the town area and talked about program opportunities, WIT team attended a school staff meeting and several smaller staff meetings to talk to all teachers about the program and garner support/spread the word. Using leveraged funding WIT also did two on site trainings for LHES teachers (Island Energy Inquiry focused in the Fall of 2015 and spring of 2016, leaving a lending library of science supplies) to increase competency in inquiry and engineering design process teaching, to support a culture of STEM teaching in school at LHES.

With over 300 participating students- and program growth expected in the next school year, it was challenging for our staff to manage the intensive curriculum planning, and 9 or more hours a week teaching (in addition to full time teaching/careers), alongside keeping timely grant documentation. In response, the program expanded from a starting point of only two defined roles (Site Coordinator and Instructor) to a possible combination of a Site Coordinator, Curriculum Coordinator, Instructors, and Educational Assistants (depending on student enrollment). Every position engages with supporting/teaching/mentoring students, but each position has specific duties to ensure proper coverage from intensive high quality curriculum to community connections to parent engagement to documentation to safety. Specifically, the site coordinator supports site documentation, resource needs, sets program meeting agendas, coordinates scheduling of courses and program events on campus, including parent engagement evenings. The curriculum coordinator, a seasoned STEM teacher who mentors and supports all site courses, while also teaching. They suggest and support high engagement activities and program planning, this person works closely with the site coordinator on planning site meetings, parent engagements and community connections. An instructor facilitates a course or courses of which they are responsible for, and communicates with the coordinators on their needs. Site educational assistants are carefully chosen mentors who support all staff in guiding students; this past year the program had homegrown STEMworks students who have graduated and now returned with professional experience to their home middle/elementary schools to mentor young students.

The program experienced some specific, unforeseen challenges at one of its sites: Iao Intermediate. All of the facilitators and administrating faculty at Iao who supported and signed off on initiating the grant transitioned to other schools before implementation began. Significant attempts were made during the 2015-16 school year to engage the new administration and garner support for the program. Emails and phone calls and requests for meetings were initially fruitless. Eventually, the school principal met with the project director and verbally expressed support for the program, but then consistently failed to follow through. The program communicated its successes with school administration and students' families, and conducted family engagement activities which featured the Maui High School robotics team and a three-day software workshop open to teachers, families and students, but full implantation of the program was continually thwarted by a lack of interest and commitment on the part of the school administration. It became clear that the program's resources would have a greater impact at a site where the administration viewed the program as an ally, and the decision was made, in consultation with the Hawaii DOE and Maui Superintendent, to transition the program to another

school with appropriate infrastructure and administrative support. The award transitioned from Iao Intermediate to Pukalani Elementary, with immediate success, reaching over 195 students in the fall of 2016.

In the grant application, it was expected that the strongest community-based partnerships would be with entities that Women in Technology already had strong ties to. While this has been true to some extent (e.g. UH Institute for Astronomy, UH Maui), the program has developed new partnerships based on the evolving curriculum concentrations and interests of the students in the program. Thus, new partnerships were forged with ecoQoob, Hawaii Drone Services, Maui Makers, Brown & Caldwell, the ProArts Playhouse, and the Maui High Robotics Team.

Aside from the challenges with a lack of support/interest from the administration at the Iao site described above, site observations; surveys of students, parents and teachers; planning meetings with teachers and administrators, and consultation and collaboration with community partners, all indicate that the program activities are useful, relevant, interesting, valuable and engaging.

In addition to the Key Performance Indicators/Program Measures described in the next session, the program gathered additional data on students' perceptions of their own strengths and areas for improvement, their interest in STEM careers, their mastery of elements of engineering design process, and their development of team-building and teamwork skills. Parents and students were surveyed, both to encourage and to measure aspects of family engagement. Among the findings from this additional data collection were that students talk with their families about their activities in the afterschool program (Iao 61%, MWIS 74%, St. Anthony's 91%, LIS 75%, LHES 82%)

Going forward, the program will continue to implement its evaluation plan with its current tools for program monitoring and continuous improvement planning. These practices continue to inform the focus of the program and the methods of implementation at each site for alignment with the evolving goals of each school community and the federal priorities.

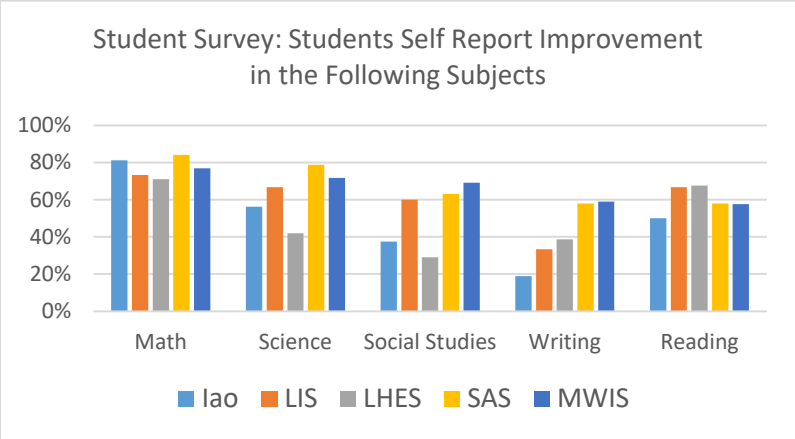
E. Results of youth and program outcomes:

Key Performance Indicators/Program Measures

Objective 1. Participants will demonstrate educational and social benefits and exhibit positive behavioral changes.	
1.1 Students participating in the program will show improvements on measures such as school attendance,	1.1a Percentage of regular program participants with teacher-reported improvement in turning in homework on time **AND** classroom participation At Iao Intermediate, there were 16 regular attendees whose parents did not sign the program waiver to acknowledge data collection. The program did not pass out surveys for students whose parents didn't sign the waiver, since the program did not want to possibly put teachers in a position where they might violate FERPA. Thus, at Iao 16 surveys for regular attendees were not passed out. Out of the 24 surveys that were passed out for regular attendees, 14 were

classroom performance.	returned. Thus, the program is missing data for 42% of students for whom surveys were distributed. This being said, 64% of regular program participants surveyed showed teacher-reported improvement in turning in homework on time and classroom participation. At LIS and LHES, the number of surveys returned was also too small to be considered valid feedback. However, of those returned, at each of these schools, 100% showed teacher-reported improvement in turning in homework on time and classroom participation. At MWIS, there was a productive sample size of 95 surveys returned. Of these, 51% showed teacher-reported improvement in turning in homework on time and classroom participation.
	1.1b Percentage of regular program participants with teacher-reported improvement in attending class regularly: Iao: 29% LHES: 83% LIS: 83% MWIS: 16%
	1.1c Percentage of regular program participants with teacher-reported improvement in student classroom behavior: Iao: 29% LHES: 83% LIS: 83% MWIS: 15%
Objective 2. 21st Century Community Learning Centers will offer a range of high-quality educational, developmental, and recreational services.	
2.1 Core educational services: 100% of our sites offer high-quality services in at least one core academic area. The project based application of a variety of subject areas supports the high quality application of core subject areas. For example, through VEX robotics, CAD software (computer aided design) and 3-D printing, students hone mathematical scale, geometric and 3-dimensional design and material strength. Though coding and programming, students practice logical reasoning, relating to the development of mathematical critical thinking skills. Through broadcasting and PSA digital movies, students' research, interview, summarize, storyboard, write scripts - practicing critical skills in both literacy and reading. Throughout each process, students developed communication and peer mentorship skills as they practiced perseverance through each step of the process in projects. Culminating activities included presentation amongst site classrooms and ultimately in front of parents at engagement evenings or showcasing projects during competitions and conferences. The first graph below depicts the percentage of students who self-reported increased ability in math, science, social studies, reading and writing skills. The second graph depicts	

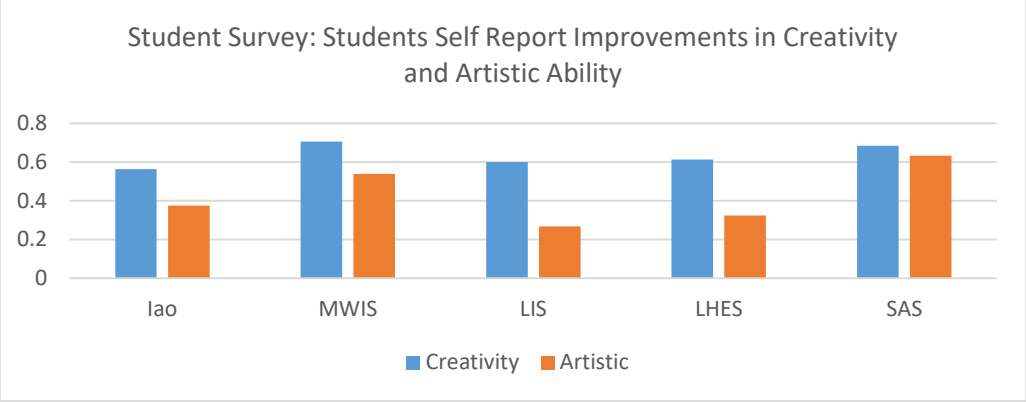
students who self-reported increased abilities in a variety of academic/professional skills which support all classroom subject areas.

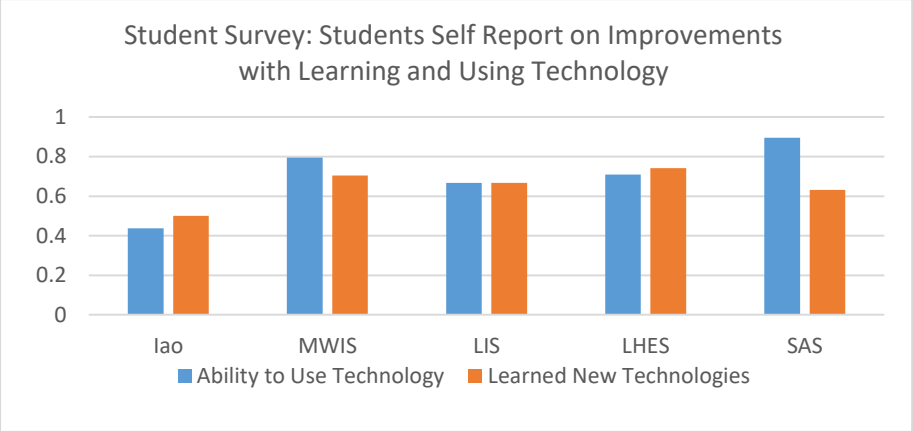


2.2 Enrichment and support activities: 100% of our sites offer academic assistance and technology enrichment.

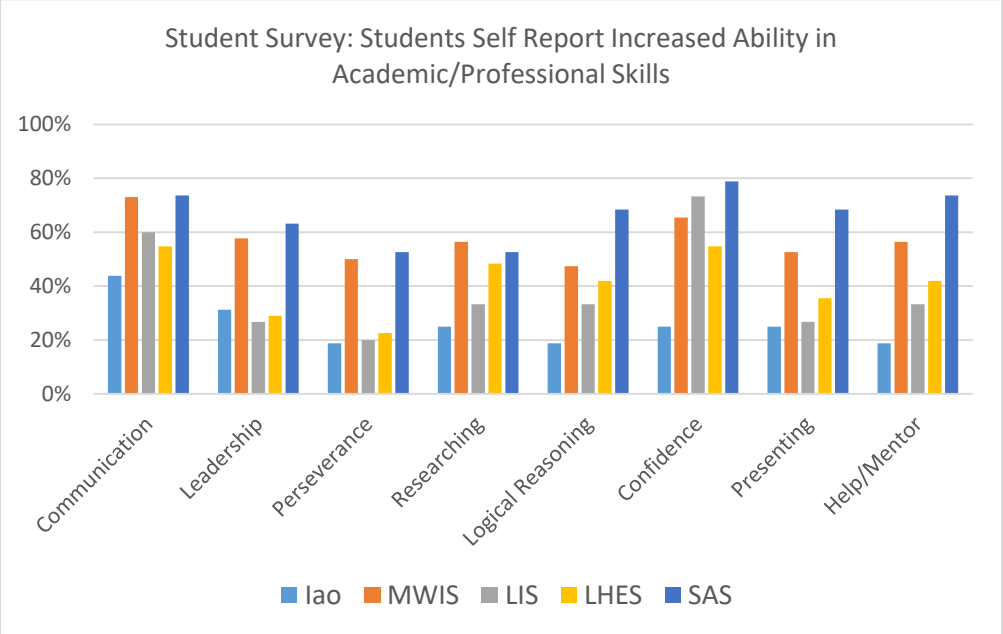
STEMworks AFTERschool is a multi-faceted, hands-on program where students get to use the most current, high-end technologies in actual community service learning projects. Students in STEMworks AFTERschool are challenged to be self-directed, responsible individuals while developing the skills to navigate building collaborative professional and community relationships. All activities are student centered, creating an environment where teachers become facilitators, navigating student learning through community based and culturally relevant projects that integrate technology to solve problems. All sites also support academic tutoring on an individual student basis.

Through utilizing the engineering design process in an array of activities, such as CAD drawing/modeling, 3-D printing, and digital media- photoshop, after effects, etc, students practice creativity and hone their artistic abilities. The graph below depicts the percentage of students at each school that self reported an increase in creative and artistic abilities as well as the student's development of learning and using new technology:



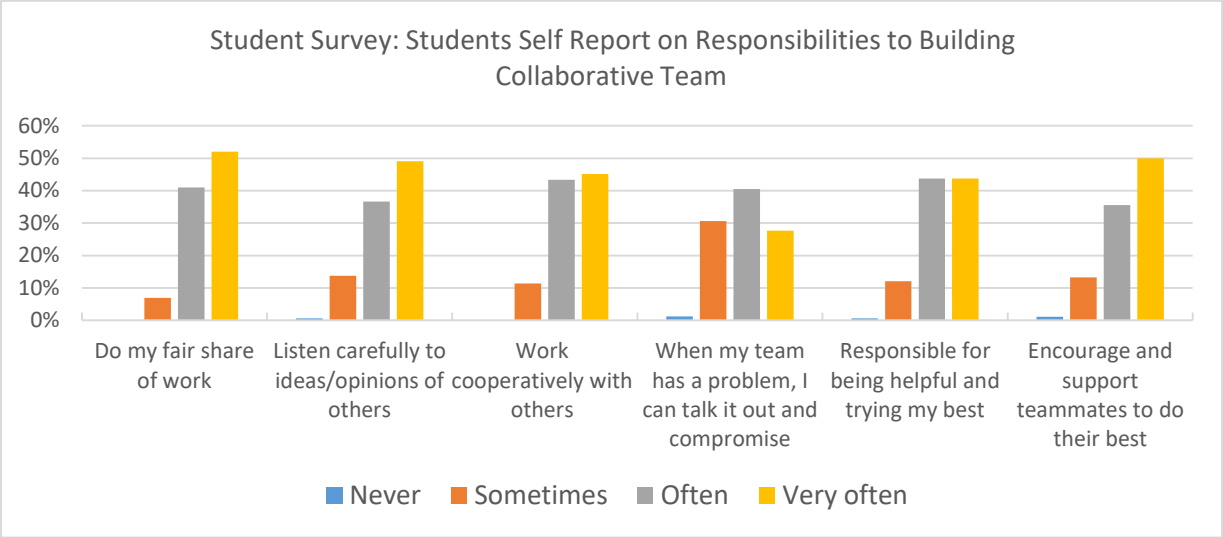


This graph depicts students who self-reported increased abilities in a variety of academic/professional skills which support all classroom subject areas.



2.3 Community involvement:

Prior to establishing, developing, and maintaining their own community partnerships - which is a goal for all students as they progress into high school, students must establish, develop, and maintain collaboration skills within the classroom. The graph below depicts the percentage of students who self-reported increased abilities towards developing their responsibility to building collaborative classroom teams.



Across the past year, each of the sites developed community partnerships which supported program during the afterschool hours and into parent engagement evenings.

Maui Waena connected with ecoQoob app creators during parent engagement evening, the focus was on global energy crisis and how to be energy efficient. Presentors demonstrated how they created a company and used technology to locally create an app designed to help solve problems- content from this presentation connected to student projects relating to developing digital media PSAs for a PBS News Hour competition about environmental challenges. Before December break, students received critical feedback on their video productions from YouTube professional who worked for the channel "The Fung Bros"; digital media content, compositions, storytelling and filming were all discussed. At a parent engagement evening in third quarter, counselors, teachers, and students from Maui High conversed with students about opportunities for high school and college pathways, pathways which connect to the skills the students are developing in middle school. Culminating third quarter, students competed at STN (Student TV Network) Conference, taking home eight awards for their digital media PSAs and productions. Maui Waena students also competed in and attended the STEM Conference breakout sessions and competitions, earning several first place awards!

Lanai High & Elementary School has steadily been working towards community integration and skill development with students. LHES has made strong connections with the local company Hawaii Drone Services, and one of the founders now teaches sUAS design, build, and flight for the program. Hawaii Drone Services has also engaged both students and families during two family engagement evenings. The site coordinator has been developing connections with the island and Maui county community, and students attended a very successful career fair where many local, county, and state community organizations and colleges shared opportunities for students, a rise program in enrollment corresponded with this event. LHES students also competed in and attended the STEM Conference breakout sessions and competitions.

Iao Intermediate connected with the Maui High Robotics team Blue Thunder, who shared with families at a parent engagement evening. This connection culminated with the fall robotics

program and geared students up for their first robotics competition; students learned about aspects of the high school club opportunities from engineering design, to digital media documentation. In quarter 3, Iao had a long term mentorship with two high school students from King Kaulike, these students mentored the middle school students in developing their programming and coding skills. Culminating the year was a motion stop animation workshop and parent engagement evening where students learned produced and premiered short films focused on energy efficiency. Iao students also attended the STEM Conference breakout sessions.

Lahaina Intermediate invited Maui Makers during the launch of 3-D printing on site. The Boeing Engineer supported students in tips for printing and modifying the 3-D models they had created using CAD software. In the spring, students showcased their VEX robots, used in the state completion as well as the engineering design process behind using CAD and 3-D printing to produce models, some of which were used as props in a theatrical production at the ProArts Playhouse. This event was very well attended and part of the school's KeAli'i event, published in the Lahaina News. During a family engagement evening focused on college and career pathways, female environmental engineer spoke to students and parents about her career pathway, from being a middle school student at LIS to becoming an environmental engineer with local firm, Brown & Cadwell. LIS students also competed in and attended the STEM Conference breakout sessions and competitions.

2.4 Services to parents and other family members: 100% of our centers offered services to parents and other family members of students enrolled in the program.

Maui Waena Intermediate
Aug 19, 2015 – Maui Waena Parent/Community Kick-off #1
August - September – Collect Parent Surveys for student needs and feedback
Sept 28, 2015 – Maui Waena Career Parent night #2 with ecoQoob app creators
Feb 17, 2016- MWIS Parent Night #3- Career/HS pathway focus

Lahaina Intermediate
Sept 3, 2015 – Lahaina Parent Night #1/Community Kickoff and student exhibition
September- October – Collect Parent Surveys for student needs and feedback
March 9, 2016 – LIS – KeAli'i -Parent Night #2- Highlighting Robotics, 3-D printing
March 10, 2016 LIS Parent Career Night #3- Formal Student STEM Project Presentations

Lanai High & Elementary School
Sept 16, 2015 – Lanai school staff presentation about AFTERschool/WIT, plus site meeting
Sept 30, 2015 – Lanai High and Elem. Parent/Community Science Night and Kick-off #1
September to October – Collect Parent Surveys for student needs and feedback
Feb 10, 2016 – LHES Parent Night #2 – Career and HS pathway focus
April 12, 2016 – LHES Student STEM Booth Exhibition – Family Night #3

Iao Intermediate:
October to December – Collect Parent Surveys for student needs and feedback
Dec 2, 2015 – Iao Int. Career Exploration Night (Family Night #1) Maui High Robotics team presents on Engineering/programming with robotics

Dec 18, 2015 – Emailed Iao Families newsletter with stories summarizing STEMworks AFTERschool fall program activities
April 13, 206 –Emailed IAO families about Royer Studios (April 29, 30 –May 2) Event for student & parent sign–up
April 14, 2016 – Emailed all LHES and Iao Families to complete Student Survey #2
April 29, April 30, May 2 – Royer Studios Motion-Stop Animation Workshop (Digital Media training + Parent Engagement #2)
May 2, 2016 – Iao Parent Engagement #3, Student Film Premiere and Renewable Energy Hands-on Exploratory

2.5 Extended hours: 100% of our centers offer services at least 12-16 hours per week on average and provide services when school is not in session, such as during the summer and holidays.

During the 2015-2016 school year, Iao Intermedaite offered 12 hours per week, Lahaina Intermedaite offered 9 hours per week, Maui Waena offered 16.75 hours per week, and Lanai High & Elementary School offered 15.5 hours per week. These hours were all offered afterschool and aligned with school ending hours. At LHES and MWIS, a variety of sometimes overlapping courses where offered on different days, allowing students to choose by interest. Summer program in 2015 did not run due to the arrival of late funding, in Summer of 2016 program at MWIS and LHES is being offered with the support of additional funds.

Objective 3. 21st Century Community Learning Centers will serve children and community members with the greatest need for expanded learning opportunities.

3.1 High-need communities: 100% of our sites are located at Title I schools. The percentage of students eligible for free or reduced price lunch at each site are as follows:

Iao Intermediate:47%
Lahaina Intermediate: 57%
Lanai High and Elem: 39%
Maui Waena Intermediate: 56%

Objective 4. Participants in 21st Century Community Learning Centers will demonstrate academic improvement based on formative and summative assessments given throughout the school year.

4.1 Participants in 21st Century Community Learning Centers will demonstrate academic	Percentage of regular program participants with teacher-reported improvement in reading/language arts: Iao: 29% LIS: 74% LHES: 67% MWIS: 63%

improvement in reading/language arts and/or math.	Percentage of regular program participants with teacher-reported improvement in math:	
	Iao: 25%	LIS: 50%
	LHES: 50%	MWIS: 63%

Program Quality Outcomes:

In addition to the measures above, program quality is evaluated and monitored via site observations and student surveys. Feedback obtained via these tools indicates that the programs are succeeding at providing a positive program climate, with enrichment program practices that promote youth engagement and stimulate thinking, with both youth-directed and staff-directed relationship building.

Within the process of this evaluation, the Project Director was asked to reflect upon differences between the experiences of each site, and, in particular, to reflect upon the suggestion from the data that students at MWIS experienced the broadest and deepest positive impacts. The main difference in program delivery at MWIS is that the students at that school mostly attend the afterschool program every day of the week. It is possible to conclude that greater exposure to the program's offerings resulted in greater impacts.

Conclusions and Recommendations

A. Conclusions

- The program effectively engaged the intended participants.
- The program provided high-quality services supporting core subjects, including math and science education and reading.
- The program provided high-quality, hands-on, technology-based enrichment activities to participating students.
- The program met expectations regarding the delivery of family engagement activities.
- The program excelled at involving community partners (private business; federal, state, and county government, institutions of higher learning) and generating in-kind donations of personnel hours or software.
- Based on the self-reporting of students, program participants at all sites benefitted in the following areas: math, science, reading, creativity, learning and using technology, communication and confidence. Students at the MWIS program also widely reported benefits in leadership, perseverance, research skills, logical reasoning, presenting skills, and writing.
- The program is meeting or exceeding expectations for improving student performance in the areas of classroom participation and turning in homework on time. At LHES and LIS, teachers also reported that most students showed improvements in attendance and classroom behavior.
- More information is needed to assess the program's effectiveness at improving students' school day performance in core subjects. The program experienced challenges at some schools in securing waivers, which resulted in insufficient data to reach firm conclusions regarding the effectiveness of the program in improving

student performance during the school day in math, reading and language arts. The available data suggests that more than half of participating students experienced improvement in these subject areas.

B. Recommendations regarding the program

To improve data collection, it is recommended that each site:

- Dedicate a few staff hours each week for record-keeping and checking in with parents and students for documentation. Follow up by project director to reinforce that these hours be used in this fashion, and to promote understanding that the record-keeping is necessary and useful in communicating results to funders and in informing the continuous improvement of the program

It is further suggested that each site:

- Adopt and implement a policy of inviting students to participate for a limited number of introductory days, but then require completed initial paperwork in order to participate
- Follow up using the WIT-created "missing waiver & survey" packets with a letter about the program and meet parents as they pick up students with missing paperwork.
- Use family nights as an additional opportunity to locate parents who need to complete waivers for their students.

To support student improvement in math, reading, and language arts, it is recommended that the Project Director:

- Explore staffing solutions with each site, such as the use of a Curriculum Coordinator and Educational Assistants, in addition to Site Coordinators and Instructors, to ensure a focus on these improvements and bridges to the school day curriculum.
- Consider seeking to ensure representation of math and language arts backgrounds within the general goal of hiring staff from a diversity of background disciplines
- Inquire directly with the math and language arts teachers at each site regarding how the program might further support improvements in these subjects during the school day. This may include expanding the time dedicated to tutoring or homework completion.

To support continuous improvement and ensure program quality, it is recommended that:

- The program continues to implement its evaluation plan as structured.
- Continue to be shared summarized data from survey instruments from each site be shared with all staff from the respective site during informal site visits so that this information can shape the program and its delivery, including by further revising data collection instruments to best serve the goals of the grant and the individual sites

C. Evaluation Impacts

This evaluation, its conclusions and recommendations will form the basis of "continuous improvement" conversations at each site, facilitated by the Project Director. These conversations will further staff understanding of the goals of the grant and the value of data collection to effective evaluation. It is expected that the information provided by this evaluation will impact the program's data collection practices, feedback sharing practices, and efforts to support students in improving their performance in the core subjects of math and language arts.

D. Dissemination

This full report will be distributed to the school principals and site coordinators of each participating school. The executive summary and a summary of resources devoted will be further disseminated via the Women in Technology website, as well as emails to the parents in each school community, and via flyers sent home with students and distributed at future family engagement nights, and meetings with community partners.