UNIT REPORT

# Millard Oakley STEM Center - Final Annual Report

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## Definition of Millard Oakley STEM Center

**Start:** 07/01/2016

**End:** 06/30/2017

**Providing Department:** Millard Oakley STEM Center

**Department/Unit Contact:** Sally Pardue

**Mission/Vision/Goal Statement:**

**Vision**

The Oakley STEM Center is a national leader in rural STEM Education.

**Mission**

The Oakley STEM Center enriches pre-kindergarten through college (P-16) student STEM learning with hands-on inquiry, enhances the STEM preparation of new and practicing prekindergarten through high school (P-12) teachers, models innovative instructional design and learning environments, conducts rigorous STEM education research, and collaborates with industry and organizations to strengthen STEM education initiatives across the region, state, and nation.

**Administrative Support Services**

Provide proposal development assistance with STEM education research grants, records keeping and purchasing assistance for principal investigators on funded STEM education research grants including professional development, interact with regional K-12 school systems and industry partners for STEM education outreach for students, teachers, and public.

**Academic and Student Support Services**

Schedule with Colleges and Departments for delivery of ~50 courses/semester in Ray Morris Hall (four classrooms and auditorium), provide instructional technology assistance for instructors while in the building, schedule use of building by student and campus organizations.

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## Oakley STEM Center Goal 1 Outreach

**Define Goal:**

**Oakley STEM Center Goal 1**

Outreach: Provide STEM learning experiences for teachers (of grades preschool (P) through college (16)), students and families, and community members.

**Intended Outcomes / Objectives:**

**Goal 1 Objectives with Target Outcomes in italics**

1.1 Provide quality professional development (PD) and resources for P-12 STEM teachers that are based on local needs, aligned with state and national standards, and that model best practice in research-based STEM education. *(> 10 self-supported short duration PD events with teachers, > 12 participants per event, > 4 grant-supported long duration PD events with teachers > 20 participants per event)*

1.2 Provide quality STEM enrichment for P-12 students in collaboration with P-12 teachers. *(> 15 teacher-led events with students, > 100 participants per event)*

1.3 Provide programming to increase informal STEM education opportunities for the community. *(> 6 events with family/student/community members attendees, > 100 participants per event)*

1.4 Provide resources for P-16 STEM teachers consisting of: a) lending library of STEM instructional equipment and b) on-line webportal for electronic curation of workshop materials, lesson plans, units, modules, and videos and for formation and support of digital professional learning communities (D-PLC); and (c) STEMmobile. *(> 10,000 lendable items in lending library with 1% increase annually, > 10% of eligible members checking out resources, > 100 electronic artifacts posted annually, > 50 new members added to D-PLC annually, > 20 weeks use of STEMmobile)*

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## Oakley STEM Center Goal 2 Academics

**Define Goal:**

**Oakley STEM Center Goal 2**

Academic: Engage TTU campus stakeholders (colleges, departments, faculty, students) in the use of the Ray Morris Hall facility and Oakley STEM Center programs.

**Intended Outcomes / Objectives:**

**Goal 2 Objectives with Target Outcomes in italics**

2.1 Support faculty in their modeling of effective STEM instruction for future teachers. *(> 6 faculty per semester)*

2.2 Operate a STEM Student Ambassador program for TTU students to learn effective ways to support STEM education. *(> 10 students per semester)*

2.3 Facilitate TTU departments and faculty use of the Center for integrated STEM programs and courses for STEM majors on campus. *(> 3 events per semester, > 15 courses per semester)*

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## Oakley STEM Center Goal 3 Research

**Define Goal:**

**Oakley STEM Center Goal 3**

Research: Support TTU campus faculty in the development and dissemination of STEM education research activities.

**Intended Outcomes / Objectives:**

**Goal 3 Objectives with Target Outcomes in italics**

3.1 Foster inter-collegial and multi-campus collaboration for STEM education research *(> 10 interactions in individual/group settings annually)*

3.2 Promote the learning studios and interview rooms as research spaces. *(> 4 events per semester)*

3.3 Disseminate STEM education research and development occurring in the university and in the region. *(> 6 events annually)*

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## Oakley STEM Center Goal 4 Center Administration and Leadership

**Define Goal:**

**Oakley STEM Center Goal 4**

Center Administration and Leadership (CA&L): Establish, maintain, and update Center operational procedures and relationships.

**Intended Outcomes / Objectives:**

**Goal 4 Objectives with Target Outcomes in italics**

4.1 Meet with Advisory Council to receive input on Center goals and outcomes. *(Annually)*

4.2 Establish, maintain, and update procedures for each facet of Center programming. *(Bi-annually)*

4.3 Develop and maintain relationships with key individuals from external groups. *(> 6 events annually)*

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## Assessment: Communications Log

**Goal/ Outcome/ Objective:** Goal 1(Objective 1.1, 1.3), Goal 3 (Objective 3.3)

**Type of Tool:** Tracking Spreadsheet

**Frequency of Assessment:** annually

**Rationale:**

**Communications Log**

(1) provides comprehensive communications including artifacts, EDU updates to STEM Center stakeholders who have requested notification through monthly memos via contact lists, semester updates to campus, presentations to visitors and to organizations/groups on-site and off-site, attendance at Upper Cumberland Study Council meetings and professional organizations, Live interviews, radio spots, PSAs, websites statistics and usage (www.tntech.edu and www.ucrsi.org), press releases, Livestream, blogs, tweets, Facebook, capture the contact lists with student organizations.

(2) Success is defined as offering multiple marketing and reporting opportunities to increase accessibility for STEM Center stakeholders.

(3) All communications activities are tracked and sustained at the STEM Center and offer a real time evaluation of communications. The log is populated as communications occur.

(4) All logs, collections and reports are maintained at the STEM Center. The log is totaled annually and analysis is provided to the Director of the STEM Center for annual review of activity.

Attached Files
1463675464_summer_edu_update
20150804_Fall2015_EDU_Update
Oakley STEM Center at Tennessee Tech_FB_Fans
Oakley STEM Center at Tennessee Tech_FB_Insights_Reach
Oakley STEM Center at Tennessee Tech_FB_Notifications
Oakley STEM Center at Tennessee Tech_FB_Posts
Spring2016_Edu_Update

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## Assessment: Grant Log

**Goal/ Outcome/ Objective:** Goal 1 (Objective 1.1), Goal 3 (Objective 3.1, 3.3), Goal 4 (Objective 4.3)

**Type of Tool:** Tracking Spreadsheet

**Frequency of Assessment:** annually

**Rationale:**

**Grant Log**
(1) provides information about number of submitted proposals and funded proposals with title, PI, coPI, and senior personnel identified, amount requested/awarded, abstract, outcomes, participant statistics (numbers, names, counties, grade level, subject, etc.).

(2) Indicators of success show collaboration with faculty members (<10 annually) as PI and coPIs on proposal submissions for

STEM education research and/or service projects.

(3) Submitted and funded proposals documented in the STEM Center. The Grant Log is populated as proposals are submitted and as grant awards are made.

(4) All proposals, results, records, tabulations and reports are maintained in the STEM Center. The Grant Log is reviewed annually, a summary of activity is made and shared with the Director and partnering faculty.

## Assessment: Grant Log

**Goal/ Outcome/ Objective:** Goal 1 (Objective 1.1), Goal 3 (Objective 3.1, 3.3), Goal 4 (Objective 4.3)
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## Assessment: Outreach Event Log

**Goal/ Outcome/ Objective:** Goal 1, Objectives/Outcomes 1.1, 1.2, 1.3
**Type of Tool:** Tracking Spreadsheet
**Frequency of Assessment:** per event
**Rationale:**
**Outreach Event Log**
(1) captures participation, demographics and collaborations of each outreach event within three days following event.

(2) Indicators of success are:
a) delivery of 10 self-supporting budgeted offerings per year for P-12 teachers (>12 participants per event) and 4 external grant supported offerings for teachers (>20 participants per event) to engage in STEM education, standards-based, professional development based on LEA needs;
b) collaborating with regional teachers (>15 participants annually) to offer STEM hands-on enrichment opportunities to engage P-12 students (>100 participants per event) during the school day on-site at the STEM Center for EXPEDITION field trips or off-site at their individual schools;
c) provide 6 informal STEM education events per year for children, family members and community participants/volunteers to gain access to STEM learning in a manner that is easily relatable, interactive, purposeful and engaging while illustrating STEM principles;

(3) The Outreach Event Log captures the STEM learning opportunity specifics of each outreach event based on needs put forth by geographic needs assessments. It includes date, participant type of engagement, demographic and geographic information, number of participants, and volunteer facilitator participation and affiliations as each event occurs.

(4) Outreach Event Logs, reviewed quarterly, are maintained confidentially by the STEM Center.

Attached Files
Current-2013 Event Outreach Log

## Assessment: Outreach Event Log

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**Type of Tool:** Tracking Spreadsheet

**Frequency of Assessment:** per event

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## Assessment: Participant/Stakeholder Surveys and Interviews

**Goal/ Outcome/ Objective:**

Goal 1 (Objectives 1.1, 1.3, 1.4), Goal 2 (Objectives 2.1, 2.2, 2.3), Goal 3 (Objective 3.1), Goal 4 (Objective 4.3)

**Frequency of Assessment:** Annually

**Rationale:**

**Participant/Stakeholder Surveys and Interviews**

(1) professional development participants express overall satisfaction with professional development programs offered through the STEM Center; stakeholders are satisfied with
STEM Center services.

(2) Indicators of success: 70% of the professional development participants agree or strongly agree that the PD advances their STEM content knowledge or pedagogical content knowledge, provides a model for effective instruction, and that workshop activities are relevant to curriculum standards and are applicable to classroom settings; 70% of stakeholders will indicate satisfaction with STEM Center services.

(3) The survey response rate(s) is expected to vary, but overall is 50% or greater and captures subjective assessment of outcomes, details of planned implementation and learning strategies, feedback and suggestions for future event planning. The surveys are conducted on-line annually for participants from all PD programs directly sponsored by the STEM Center; the stakeholders are interviewed individually, random sampling, or via focus groups with summary write-ups. The results are reviewed annually to summarize strengths and weaknesses of the offerings.

(4) The surveys, results, reports and logs are maintained at the STEM Center and shared with the Director of the STEM Center.

## Assessment: Participant/Stakeholder Surveys and Interviews

**Goal/ Outcome/ Objective:**

Goal 1 (Objectives 1.1, 1.3, 1.4), Goal 2 (Objectives 2.1, 2.2, 2.3), Goal 3 (Objective 3.1), Goal 4 (Objective 4.3)

**Frequency of Assessment:** Annually

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## Assessment: Resource Usage Log

**Goal/ Outcome/ Objective:** Goal 1 (Objective 1.4), Goal 2 (Objective 2.1, 2.3), Goal 3 (Objective 3.2, 3.3)

**Type of Tool:** Tracking Spreadsheet

**Frequency of Assessment:** semester

**Rationale:**

**Resource Usage Log**

(1) facility usage of Ray Morris Hall for STEM-related education; Lending Library will indicate that items are being checked out, that new items are being added; UCRSI.org site records indicate that electronic artifacts are being added to the on-line webportal, and that new members are being added to the digital professional learning communities (D-PLC) for STEM education.

(2) Success is defined as maximization (90%) of the facility use for STEM-related activities; a working inventory of 10,000 items in the equipment library with 1% growth in new items added per year; 10% of eligible members of the library checking out items; 100 new electronic artifacts being posted in the on-line webportal www.ucrsi.org; and 50 new members being added into the D-PLC annually.

(3) Requestors use the TTU Facility Request form for Oakley STEM Center to schedule campus usage and off-campus groups' usage of Ray Morris Hall for STEM education or other related events. These paper files are scanned and added to the log files. The Lending Library site statistics and UCRSI.org site statistics are updated monthly and reviewed annually.

(4) The Resource Usage Log is made up of site reports, and a paper file of facility request forms. These are maintained at the STEM Center.  The reports are shared with the Director of the STEM Center.

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**Frequency of Assessment:** semester

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## Results 1.1

**Goal/Objective/Outcome Number:** Goal 1, Objective/Outcome 1.1

**Results:**

| | ASSESSMENTS | | |
|---|---|---|---|
| **GOALS and OBJECTIVES** | Outreach Event Log | Grant Log | Communications Log |
| **Outreach 1.1 performance target** > *10 self-supported short duration PD events with teachers with > 12 participants per event,* > *4 grant-supported long duration PD events with teachers > 20 participants per event* | | | |
| **1.1 STEM PD - Teachers** | 1.1 Provide professional development (PD) opportunities for P-16 STEM teachers based on local needs, aligned with state and national standards, with best practices in research-based STEM education. | **490** teachers attended **7** distinct types of PD events, some with multiple offerings as detailed below:<br>• **157** teachers attended **10** Lending Library Training workshops<br>• **5** teachers attended **3** Lending Library PLC sessions<br>• **50** teachers attended **2** Code.org Workshops<br>• **86** teachers attended **6** Ready For TN Science PLC sessions<br>• **103** teachers attended **9** Integrated Math PLC sessions<br>• **8** teachers attended **3** RP/3 –D Modeling sessions<br>• **16** teachers attended **1** | **144** teacher participants in **4** externally funded grants as detailed below:<br>• **64** teachers attended **1** STEMmobile orientation through **MSP LCMC grant**<br>• **50** teachers attended Innovative Educators Workshop **sponsored by TSIN**<br>• **64** teachers receiving **96** hours each of professional development through **MSP LCMC grant**<br>• **20** teachers receiving **60** hours of experiential learning on-line through **AEOP RESET grant**<br>• **6** teachers receiving **160** hours of STEM research experiential learning on-site | **3** EDU updates, quarterly, sent via email to teacher database of **1250** members |

| | |
|---|---|
| Drive-In to Energy PD | at 3 Army Labs vi **AEOP RESET grant** |
| | • **4** Noyce inductees, 1st year teachers, via **NSF Noyce grant** |

## Results 1.1

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## Results 1.2

**Goal/Objective/Outcome Number:** Goal 1, Objective/Outcome 1.2

**Results:**

| GOALS and OBJECTIVES | ASSESSMENTS | | |
|---|---|---|---|
| | Outreach Event Log | Resource Usage Log | Grant Log |

**Outreach 1.2 performance target:** *> 15 teacher-led events with students, > 100 participants per event*

| | | | | |
|---|---|---|---|---|
| **1.2 STEM enrichment - Students** | 1.2 Provide STEM enrichment for P-12 students in collaboration with P-12 teachers. | **1641** students attended **21** EXPEDITIONS<br><br>**3500** students interacted with STEMmobile at **9** elementary/middle school sites.<br><br>**5000** students interacted with the STEMmobile at College of Engineering Makers on the Move visits to **4** High Schools | **13** schools used the STEMmobile | **10** undergraduate pre-scholarship students via the Noyce grant;<br><br>**4** scholarship students via Noyce grant; |

## Results 1.2

**Goal/Objective/Outcome Number:** Goal 1, Objective/Outcome 1.2

**Results:**

| GOALS and OBJECTIVES | | ASSESSMENTS | | | |
|---|---|---|---|---|---|
| | | Outreach Event Log | Resource Usage Log | Grant Log | |
| **1.2 STEM enrichment - Students** | 1.2 Provide STEM enrichment for P-12 students in collaboration with P-12 teachers. | **1641** students attended **21** EXPEDITIONS<br><br>**3500** students interacted with STEMmobile at **9** elementary/middle school sites.<br><br>**5000** students interacted with the STEMmobile at College of Engineering Makers on the Move visits to **4** High Schools | **13** schools used the STEMmobile | **10** undergraduate pre-scholarship students via the Noyce grant;<br><br>**4** scholarship students via Noyce grant; | |

**Outreach 1.2 performance target:** *> 15 teacher-led events with students, > 100 participants per event*

# Results 1.3

**Goal/Objective/Outcome Number:** Goal 1 (Objective 1.3)

**Results:**

| GOALS and OBJECTIVES | ASSESSMENTS | | |
|---|---|---|---|
| | Outreach Event Log | Resource Usage Log | Communications Log |
| **Outreach 1.3 performance target:** *> 6 events with family/student/community members attendees, > 100 participants per event* | | | |
| **1.3 Informal STEM - Community** 1.3 Provide programming to increase informal STEM education opportunities for the community. | **1665** participants in **11** distinct types of events, some with multiple offerings as detailed below**:**<br>• **65** students attended ASC Girl Scout event<br>• **40** students attended Aspirations Award Ceremony<br>• **2** students attended 3D Printing Workshops<br>• **95** students attended Cub Scout Day Camp at Happy Haven<br>• **151** students and family members attended **3** FAB Fridays,<br>• **101** students (63) and family members (38) attended 1 Shortest Day event,<br>• **189** students (122) and family members (67) attended 10 Maker Camo Sessions<br>• **397** students (218) and family | Virtual Theater:<br>**2349** viewers in Virtual Theater in **48** distinct events<br>• **1641** K-12 students through EXPEDITIONS program, and<br>• **456** community members and university students attended Open Viewings, and special scheduled visits<br>• **252** as part of FAB Friday and Shortest Day events**.** | **6** radio spots<br>**4** press releases<br>**12** updates of tntech.edu/stem website, monthly |

members (179) attended **4** Saturday STEM Safaris;
- **450** children and families visit STEMmobile at Stations of Imagination
- **45** community members attended TED Talk event in partnership with WCTE, leading into Nature Fest
- **130** Student, Family and Community participants for UC Making and Manufacturing Event

## Results 1.3

**Goal/Objective/Outcome Number:** Goal 1 (Objective 1.3)

**Results:**

| | ASSESSMENTS | | |
|---|---|---|---|
| **GOALS and OBJECTIVES** | Outreach Event Log | Resource Usage Log | Communications Log |
| **Outreach 1.3 performance target:** *> 6 events with family/student/community members attendees, > 100 participants per event* | | | |
| **1.3 Informal STEM - Community** 1.3 Provide programming to increase informal STEM education opportunities for the community. | **1665** participants in **11** distinct types of events, some with multiple offerings as detailed below**:**<br>• **65** students attended ASC Girl Scout event<br>• **40** students attended Aspirations Award Ceremony<br>• **2** students attended 3D Printing Workshops<br>• **95** students attended Cub Scout Day Camp at Happy Haven<br>• **151** students and family members attended **3** FAB Fridays,<br>• **101** students (63) and family members (38) attended 1 Shortest Day event,<br>• **189** students (122) and family members (67) attended 10 Maker Camo Sessions<br>• **397** students (218) and family | Virtual Theater:<br>**2349** viewers in Virtual Theater in **48** distinct events<br>• **1641** K-12 students through EXPEDITIONS program, and<br>• **456** community members and university students attended Open Viewings, and special scheduled visits<br>• **252** as part of FAB Friday and Shortest Day events**.** | **6** radio spots<br>**4** press releases<br>**12** updates of tntech.edu/stem website, monthly |

members (179) attended **4** Saturday STEM Safaris;
- **450** children and families visit STEMmobile at Stations of Imagination
- **45** community members attended TED Talk event in partnership with WCTE, leading into Nature Fest
- **130** Student, Family and Community participants for UC Making and Manufacturing Event

## Results 1.4

**Goal/Objective/Outcome Number:** Goal 1 (Objective 1.4)

**Results:**

| GOALS and OBJECTIVES | Assessments | |
|---|---|---|
| | Resource Usage Log | |

**Outreach 1.4 performance target:** *> 10,000 lendable items in lending library with 1% increase annually, > 10% of eligible members checking out resources, > 100 electronic artifacts posted annually to ucrsi.org, > 50 new members added to D-PLC annually*

**Lending Library**

| | | |
|---|---|---|
| **1.4 Resources** | 1.4 Provide resources for P-16 STEM teachers: a) lending library of STEM instructional equipment and b) on-line webportal for electronic curation of workshop materials, lesson plans, units, modules, and videos and for formation and support of digital professional learning communities (D-PLC). | • **57** educators of **560** eligible members checked out **1905** items<br>• **1500** unique STEM instructional items are in inventory, often with 10 to 12 replicates for loaning multiples for use in classrooms >> 10,000 items, target met |

**UCRSI.org webportal**

- **961** members of the online webportal (added 131 members)
- **167** resources**, 57** groups**, 50** articles, **36** member blogs, **1134** tags in the on-line portal.

## Results 1.4

**Goal/Objective/Outcome Number:** Goal 1 (Objective 1.4)

**Results:**

| GOALS and OBJECTIVES | | Assessments |
|---|---|---|
| | | Resource Usage Log |

**Outreach 1.4 performance target:** *> 10,000 lendable items in lending library with 1% increase annually, > 10% of eligible members checking out resources, > 100 electronic artifacts posted annually to ucrsi.org, > 50 new members added to D-PLC annually*

## Lending Library

| | | |
|---|---|---|
| **1.4 Resources** | 1.4 Provide resources for P-16 STEM teachers: a) lending library of STEM instructional equipment and b) on-line webportal for electronic curation of workshop materials, lesson plans, units, modules, and videos and for formation and support of digital professional learning communities (D-PLC). | • **57** educators of **560** eligible members checked out **1905** items<br>• **1500** unique STEM instructional items are in inventory, often with 10 to 12 replicates for loaning multiples for use in classrooms >> 10,000 items, target met |

**UCRSI.org webportal**

- **961** members of the online webportal (added 131 members)
- **167** resources**, 57** groups**, 50** articles, **36** member blogs, **1134** tags in the on-line portal.

## Results 2.1

**Goal/Objective/Outcome Number:** Goal 2 (Objective 2.1)

**Results:**

| GOALS and OBJECTIVES | | Assessments | |
|---|---|---|---|
| | | Resource Usage Log | Stakeholder Interviews |
| **Academics 2.1 performance target:** *> 6 faculty per semester* | | | |
| **2.1 STEM Faculty - teaching teachers** | 2.1 Support faculty in their delivery of research-based STEM instruction for future teachers. | • 7 faculty teaching STEM educator courses<br>◦ Kathy Rust<br>◦ Holly Anthony<br>◦ Jane Baker<br>◦ Steve Robinson<br>◦ Peter Li<br>◦ Steven Hayslette<br>• math, early childhood, chemistry, physics, earth sciences, biology;<br>• schedule rooms, use equipment, shared office space. | **6** informal interviews conducted with faculty teaching in the Center to collect feedback on satisfaction and suggestions for improvement. |

## Results 2.1

**Goal/Objective/Outcome Number:** Goal 2 (Objective 2.1)

**Results:**


| GOALS and OBJECTIVES | | Assessments | |
|---|---|---|---|
| | | Resource Usage Log | Stakeholder Interviews |
| **Academics 2.1 performance target:** *> 6 faculty per semester* | | | |
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## Results 2.2

**Goal/Objective/Outcome Number:** Goal 2 (Objective 2.2)

**Results:**

| | ASSESSMENTS | | |
|---|---|---|---|
| **GOALS and OBJECTIVES** | Resource Usage Log and Outreach Event Log | Communications Log | Participant Surveys |

**Academics 2.2 performance target:** *> 10 students per semester*

| | | | | |
|---|---|---|---|---|
| **2.2 STEM Ambassadors** | 2.2 Develop and maintain a STEM Student Ambassador program for TTU students to learn effective ways to support STEM education. | **155** students have participated as trained volunteers. | • **13** UAS and **3** FWS students<br>  ◦ Orientation/training for students<br>  ◦ Signed Worker Agreements with each to detail duties and task for each semester<br>  ◦ Assigned into **7** Oakley STEM Center Teams as working members<br>• **12** HPEO students<br>  ◦ Orientation and training for Outreach Events Team support | Informal interviews with sampling of students to assess<br>• Additional training needs<br>• Clarification of work duties and tasks |

## Results 2.2

**Goal/Objective/Outcome Number:** Goal 2 (Objective 2.2)

**Results:**

## ASSESSMENTS

| GOALS and OBJECTIVES | Resource Usage Log and Outreach Event Log | Communications Log | Participant Surveys |
|---|---|---|---|
| **Academics 2.2 performance target:** *> 10 students per semester* | | | |
| **2.2 STEM Ambassadors** | 2.2 Develop and maintain a STEM Student Ambassador program for TTU students to learn effective ways to support STEM education. **155** students have participated as trained volunteers. | • **13** UAS and **3** FWS students<br>◦ Orientation/training for students<br>◦ Signed Worker Agreements with each to detail duties and task for each semester<br>◦ Assigned into **7** Oakley STEM Center Teams as working members<br>• **12** HPEO students<br>◦ Orientation and training for Outreach Events Team support | Informal interviews with sampling of students to assess<br>• Additional training needs<br>• Clarification of work duties and tasks |

## Results 2.3

**Goal/Objective/Outcome Number:** Goal 2 (Objective 2.3)

**Results:**

| GOALS and OBJECTIVES | | ASSESSMENTS | |
|---|---|---|---|
| | | Outreach Event Log | Resource Usage Log |
| **Academics 2.3 performance target:** *> 3 events per semester, > 15 courses per semester* | | | |
| **2.3 Access STEM** | 2.3 Facilitate TTU department, faculty, and student use of the Center for integrated STEM programs and courses for STEM majors on campus. | • Visits with **2** department leadership to explain and encourage use of STEM Center facilities<br>• Meeting with University Advancement Team to discuss endowment and other fund-raising needs for Oakley STEM Center sustainability | • **55** STEM content courses were taught in Ray Morris Hall in 2015/2016<br>• **85** distinct requests for facility use by:<br>◦ **10** TTU Student Orgs,<br>◦ **24** internal TTU faculty/department/units<br>◦ **4** grants, and<br>◦ **8** external community organizations |

## Results 2.3

**Goal/Objective/Outcome Number:** Goal 2 (Objective 2.3)

**Results:**


| GOALS and OBJECTIVES | | ASSESSMENTS | |
|---|---|---|---|
| | | Outreach Event Log | Resource Usage Log |
| **Academics 2.3 performance target:** *> 3 events per semester, > 15 courses per semester* | | | |
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## Results 3.1

**Goal/Objective/Outcome Number:** Goal 3 (Objective 3.1)

**Results:**

| GOALS and OBJECTIVES | | ASSESSMENTS | |
|---|---|---|---|
| | | Grant Log | Communications Log |
| **3.1 Collaboration** | 3.1 Foster inter-collegial and multi-campus collaboration for STEM education research. | • **11** proposals, total **$2,951,496.30**<br>• **7** new grant activations, total **$972,966.00**<br>• **2** continuing grants with available funds<br>  ◦ NSF Noyce, **$722,712.52**<br>  ◦ NSF MSSM, **$138,521.76** | • **10** research funding opportunities shared with 25 faculty<br>• **11** proposals received development assistance;<br>• **3** dialog/visits occurred with lead agency personnel<br>• **8** Letters of Partnership and Collaboration for NSF proposals<br>• **6** Liaison efforts to regional LEAs on behalf of proposal developments<br>• **8** Consultations regarding STEM resources, and research literature references |

**Research 3.1 performance target:** *> 10 interactions in individual/group settings annually*

## Results 3.1

**Goal/Objective/Outcome Number:** Goal 3 (Objective 3.1)

**Results:**

| GOALS and OBJECTIVES | | ASSESSMENTS | |
|---|---|---|---|
| | | Grant Log | Communications Log |
| **Research 3.1 performance target:** *> 10 interactions in individual/group settings annually* | | | |
| **3.1 Collaboration** | 3.1 Foster inter-collegial and multi-campus collaboration for STEM education research. | • **11** proposals, total **$2,951,496.30**<br>• **7** new grant activations, total **$972,966.00**<br>• **2** continuing grants with available funds<br>  ◦ NSF Noyce, **$722,712.52**<br>  ◦ NSF MSSM, **$138,521.76** | • **10** research funding opportunities shared with 25 faculty<br>• **11** proposals received development assistance;<br>• **3** dialog/visits occurred with lead agency personnel<br>• **8** Letters of Partnership and Collaboration for NSF proposals<br>• **6** Liaison efforts to regional LEAs on behalf of proposal developments<br>• **8** Consultations regarding STEM resources, and research literature references |

## Results 3.2

**Goal/Objective/Outcome Number:** Goal 3 (Objective 3.2)

**Results:**

| GOALS and OBJECTIVES | | ASSESSMENTS | |
|---|---|---|---|
| | | Resource Usage Log | Communications Log |
| **Research 3.2 performance target:** *> 4 events per semester* | | | |
| **3.2 Facility as Lab** | *3.2 Promote and support the learning studios, interview rooms, and other STEM Center resources as research labs and research support.* | • Learning Studios as recording rooms for observation-based physics education research,<br>◦ regular usage for Dr. Robinson for PHYS course and for grant administered through Arts and Sciences,<br>◦ approx. 25 times/semester<br>• PhD Graduate Student, Nikolas McGehee<br>• PhD Graduate Student, Abir Eldaba, graduated May 2016<br>• (7) UG paid hourly from STEM Operating or grants<br>◦ Jasmine Robinson<br>◦ Kristine Seay<br>◦ Amy Fricks<br>◦ Tyler Rye<br>◦ Ryan Thurston<br>◦ Kishen Patel<br>◦ Samantha Fletcher | • **4** letters of support written for Center administered proposals<br>• **8** letters of support written for non-Center proposal submissions email/dialog with six faculty members as they write NSF proposals submitted via other departments and Centers on campus. |

## Results 3.2

**Goal/Objective/Outcome Number:** Goal 3 (Objective 3.2)

**Results:**

| GOALS and OBJECTIVES | | ASSESSMENTS | |
|---|---|---|---|
| | | Resource Usage Log | Communications Log |
| **Research 3.2 performance target:** *> 4 events per semester* | | | |
| **3.2 Facility as Lab** | *3.2 Promote and support the learning studios, interview rooms, and other STEM Center resources as research labs and research support.* | • Learning Studios as recording rooms for observation-based physics education research,<br>◦ regular usage for Dr. Robinson for PHYS course and for grant administered through Arts and Sciences,<br>◦ approx. 25 times/semester<br>• PhD Graduate Student, Nikolas McGehee<br>• PhD Graduate Student, Abir Eldaba, graduated May 2016<br>• (7) UG paid hourly from STEM Operating or grants<br>◦ Jasmine Robinson<br>◦ Kristine Seay<br>◦ Amy Fricks<br>◦ Tyler Rye<br>◦ Ryan Thurston<br>◦ Kishen Patel<br>◦ Samantha Fletcher | • **4** letters of support written for Center administered proposals<br>• **8** letters of support written for non-Center proposal submissions email/dialog with six faculty members as they write NSF proposals submitted via other departments and Centers on campus. |

## Results 3.3

**Goal/Objective/Outcome Number:** Goal 3 (Objective 3.3)

**Results:**

| GOALS and OBJECTIVES | | ASSESSMENTS | |
|---|---|---|---|
| | | Communications Log | Resource Usage Log |
| **Research 3.3** > *6 events annually* | | | |
| **3.3 Disseminate** | 3.3 Disseminate STEM education research and development occurring in the university and in the region. | • NSF STEP MSSM project poster on display in the Ray Morris Hall Lobby to share outcomes<br>• Building Capacity for TN Science Education, presentation at National Science Teachers Association Annual Convention, with<br>• STEMobile Project Stories<br>  ◦ ASEE-SE 2015 Best of Zone Paper Award, presented at ASEE National Conference, “Upper Cumberland Rural STEM Initiative (UCRSI) STEMmobile: a sustainable model for K-12 outreach”<br>  ◦ Mobile Laboratory Coalition, National Conference, paper and presentation<br>• Social Media (twitter, facebook, etc) to share events and facts<br>  ◦ Facebook, 77posts, 125 Average Reach, 515 Likes<br>  ◦ Twitter, 33 posts, 175 Followers<br>  ◦ EDU Updates, 3 posts, 1250 Average Reach<br>  ◦ Radio Spots, 6<br>  ◦ Press Releases, 2<br>• Summaries of projects posted on tntech.edu/stem website;<br>• Hosting National Board for Public Broadcasting, in partnership with WCTE | • **3** faculty received travel support for attending STEM Conferences<br>  ◦ Suters<br>  ◦ Ramey<br>  ◦ Baker |

## Results 3.3

**Goal/Objective/Outcome Number:** Goal 3 (Objective 3.3)

**Results:**

| GOALS and OBJECTIVES | | ASSESSMENTS | |
|---|---|---|---|
| | | Communications Log | Resource Usage Log |
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## Results 4.1

**Goal/Objective/Outcome Number:** Goal 4 (Objective 4.1)

**Results:**

**GOALS and OBJECTIVES ASSESSMENTS**

| | | Communications Log | Events Log |
|---|---|---|---|
| **Administration performance targets: meet Advisory Council annually** | | | |
| **4.1 Council** | 4.1 Meet with Advisory Council to receive input on Center goals objectives and feedback on outcomes. | • Verbal requests made to potential members of Advisory Council<br>• intent to form from prior 2012-2014 UCRSI project's Advisory Council<br>• On target for formation in 2016/2017, first meeting in February 2017 | |

## Results 4.1

**Goal/Objective/Outcome Number:** Goal 4 (Objective 4.1)

**Results:**

**GOALS and OBJECTIVES ASSESSMENTS**

| | | Communications Log | Events Log |
|---|---|---|---|
| **Administration performance targets: meet Advisory Council annually** | | | |
| **4.1 Council** | 4.1 Meet with Advisory Council to receive input on Center goals objectives and feedback on outcomes. | • Verbal requests made to potential members of Advisory Council<br>• intent to form from prior 2012-2014 UCRSI project's Advisory Council<br>• On target for formation in 2016/2017, first meeting in February 2017 | |

## Results 4.2

**Goal/Objective/Outcome Number:** Goal 4 (Objective 4.2)

**Results:**

| GOALS and OBJECTIVES | | ASSESSMENTS<br>Communications Log | <br>Events Log |
|---|---|---|---|
| **Administration performance targets: conduct self-study of process documentation twice per year** | | | |
| **4.2 Documentation** | 4.2 Establish, maintain, and update procedures for each facet of Center programming. | • **6** Teams formed among staff and students as cross-functional work teams to support key aspects of Center programs<br>◦ **Communications Team**<br>◦ **Outreach Team**<br>◦ **External Funding Team**<br>◦ **Special Projects Team**<br>◦ **STEMmobile Team**<br>◦ **Lending Library Team**<br>• **Monthly** meetings with Team Leaders to discuss details of team-work to support Center programs during planning and post-delivery.<br>• Shared document storage on Center server for staff to access as needed from their desk.<br>• Using Office 365 and **Sharepoint** for team members, staff and students, to share calendars, task lists, group memory, meeting agendas, etc. | • Staff Retreat for Team Alchemy Training |

## Results 4.2

**Goal/Objective/Outcome Number:** Goal 4 (Objective 4.2)

**Results:**

| GOALS and OBJECTIVES | | ASSESSMENTS | |
|---|---|---|---|
| | | Communications Log | Events Log |
| **Administration performance targets: conduct self-study of process documentation twice per year** | | | |
| **4.2 Documentation** | 4.2 Establish, maintain, and update procedures for each facet of Center programming. | • **6** Teams formed among staff and students as cross-functional work teams to support key aspects of Center programs<br>◦ **Communications Team**<br>◦ **Outreach Team**<br>◦ **External Funding Team**<br>◦ **Special Projects Team**<br>◦ **STEMmobile Team**<br>◦ **Lending Library Team**<br>• **Monthly** meetings with Team Leaders to discuss details of team-work to support Center programs during planning and post-delivery.<br>• Shared document storage on Center server for staff to access as needed from their desk.<br>• Using Office 365 and **Sharepoint** for team members, staff and students, to share calendars, task lists, group memory, meeting agendas, etc. | • Staff Retreat for Team Alchemy Training |

## Results 4.3

**Goal/Objective/Outcome Number:** Goal 4 (Objective 4.3)

**Results:**

| GOALS and OBJECTIVES | | ASSESSMENTS | |
|---|---|---|---|
| | | Communications Log | Events Log |
| **Administration performance targets: partner interactions > 6 per year** | | | |
| **4.3 Partnerships** | 4.3 Develop and maintain relationships with key individuals from external groups. | • **8** meetings with Supervisors of Instruction Study Council<br>• **4** meetings with Advanced Manufacturing/ Pre-Engineering Pathways subcommittee of Highlands Workforce Development and Education Committee<br>• **1** meeting with Directors of Schools Study Council to provide update on overall K-12 interactions with regional LEAs<br>• **3** meetings with TN STEM Education Leadership Council to support statewide strategic plans for STEM education<br>• **6** Upper Cumberland LEA site visits, meeting with central school offices and UCRSI Hub Schools<br>• **6** meetings with TN's Science Standards Recommendations Committee<br>• **4** meetings with TN Dept of Ed's Personalized Learning Task Force | • Rotary Presentation (~**100** attendees)<br>• TSIN Summit Presentation (~80 attendees)<br>• MLC National Convention (~120 attendees)<br>• ASEE National Meeting (~3000 attendees)<br>• Manufacturers contacted for Teacher Field Trips (8 sites) |

## Results 4.3

**Goal/Objective/Outcome Number:** Goal 4 (Objective 4.3)

**Results:**

| GOALS and OBJECTIVES | | ASSESSMENTS | |
|---|---|---|---|
| | | Communications Log | Events Log |
| **Administration performance targets: partner interactions > 6 per year** | | | |
| **4.3 Partnerships** | 4.3 Develop and maintain relationships with key individuals from external groups. | • **8** meetings with Supervisors of Instruction Study Council<br>• **4** meetings with Advanced Manufacturing/ Pre-Engineering Pathways subcommittee of Highlands Workforce Development and Education Committee<br>• **1** meeting with Directors of Schools Study Council to provide update on overall K-12 interactions with regional LEAs<br>• **3** meetings with TN STEM Education Leadership Council to support statewide strategic plans for STEM education<br>• **6** Upper Cumberland LEA site visits, meeting with central school offices and UCRSI Hub Schools<br>• **6** meetings with TN's Science Standards Recommendations Committee<br>• **4** meetings with TN Dept of Ed's Personalized Learning Task Force | • Rotary Presentation (~**100** attendees)<br>• TSIN Summit Presentation (~80 attendees)<br>• MLC National Convention (~120 attendees)<br>• ASEE National Meeting (~3000 attendees)<br>• Manufacturers contacted for Teacher Field Trips (8 sites) |