Grantee Name: Battelle Education (Tennessee STEM Innovation Network)
Grant Contract Edison Identification Number: 46452
Term of Grant Contract: July 1, 2017 – June 30, 2018
Total Grant Amount: $1,500,000

PROJECT SUMMARY

Battelle Education has continued its management and support of the Tennessee STEM Innovation Network (TSIN). The TSIN is a public-private partnership between the State of Tennessee and Battelle that was established by Executive Order of the governor in 2010 and serves as the central management structure for working with schools, regional teams, industry partners, and other supporting organizations actively involved in furthering STEM educational opportunities in Tennessee. The TSIN works collaboratively with the Tennessee Department of Education to ensure alignment to the State’s STEM strategy and dissemination of STEM funded activities and their outcomes.

In addition, Battelle Education, through the TSIN:

- Works collaboratively with Tennessee STEM businesses and institutions, such as the University of Tennessee, the University of Memphis, Dyersburg State Community College, the Tennessee Valley Authority, Oak Ridge National Laboratory, and Oak Ridge Associated Universities in direct support of education initiatives aligned to support the development of great teachers and leaders
- Shares promising practices and exchanges successful models with other state STEM networks through STEMx, a national network of state-level STEM networks
- Provides technical assistance to the network’s seven regional STEM innovation hubs and designated schools to connect them with peer organizations focused on similar goals, objectives, and innovative practices
- Coordinates with the Tennessee Department of Education to develop joint messaging strategies around STEM education in an effort to align programs and mutually beneficial outcomes

TENNESSEE STEM STRATEGIC GOALS

- Increase student interest, participation, and achievement in STEM
- Expand student access to effective STEM teachers and leaders
- Reduce the state’s STEM talent and skills gap
- Build community awareness and support for STEM
STEM SCHOOL DESIGNATION

The Tennessee STEM Designation process recognizes schools that promote rigorous and experiential learning opportunities for all students. In Spring 2018, the Tennessee Department of Education, in conjunction with the Tennessee STEM Innovation Network and Tennessee STEM Leadership Council, awarded STEM Designation to 15 geographically and demographically diverse schools across the state.

Designation Interest Across Tennessee for the 2017-2018 Academic Year

<table>
<thead>
<tr>
<th>Initial Interest Form Submission</th>
<th>Completed Applications</th>
<th>Designated Schools</th>
</tr>
</thead>
<tbody>
<tr>
<td>44</td>
<td>28</td>
<td>15</td>
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Designation Timeline

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<tbody>
<tr>
<td>Schools completed self-assessment</td>
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<tr>
<td>Initial phone interviews with school leads to determine readiness to apply</td>
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<tr>
<td>Schools created portfolio applications highlighting artifacts for each of the STEM attributes</td>
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<tr>
<td>Tennessee Designation Review Team reviewed portfolio applications</td>
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<tr>
<td>Determined which schools were invited to move forward in the application process</td>
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<tr>
<td>TSIN conducted on-site observations for each school that moved forward to the second stage of the application process</td>
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<tr>
<td>TSIN made recommendations to the Tennessee Department of Education</td>
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<tr>
<td>Hosted Tennessee STEM Designation Awards at the Tennessee STEM Innovation Summit</td>
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</table>

The 2017-2018 STEM Designated Schools include:
- Chattanooga Girls Leadership Academy, Hamilton County Department of Education
- D-B EXCEL, Kingsport City Schools
- Dr. William Burrs Elementary School, Sumner County Schools
- Jack Anderson Elementary School, Sumner County Schools
- Jackson Christian Elementary School, Jackson-Madison County Private School
- L&N STEM Academy, Knox County Schools
- Maxine Smith STEAM Academy, Shelby County Schools
- Midway Elementary School, Roane County Schools
- Moore Magnet Elementary School, Clarksville-Montgomery County School System
- Oakmont Elementary School, Sumner County Schools
- Overall Creek Elementary School, Murfreesboro City Schools
- Prescott South Elementary School, Putnam County School System
- STEM School Chattanooga, Hamilton County Department of Education
- Union Elementary School, Sumner County Schools
- Whitehaven Elementary School, Shelby County Schools

OUTCOME:

In 2015, Battelle Education contracted with Chattanooga-based Thinking Media, Inc. to make its innovative product, Learning Blade, available to all middle schools in the state. Learning Blade is a supplemental STEM career awareness curriculum that emphasizes the benefits of STEM careers, demonstrates the relevance of academic skills to future careers, and provides real-world examples of the use of math and ELA skills in practical situations. Studies show that during the middle school years, students begin to form their initial attitudes toward future careers. Learning Blade uniquely fit the need recognized by the network to positively influence students in their formative years to consider STEM careers through the use of technology. During the 2017-2018 academic year, 296 schools in Tennessee activated their Learning Blade accounts, leading to over 202,359 lessons being completed by Tennessee students with a total of 96,590 students currently registered in the system. During the 2017-2018 school year, 609 teachers and administrators were trained to implement the Learning Blade system.
The Grantee, through TSIN, shall implement STEM leadership training and professional development in all STEM Innovation Hub regions.

OUTCOME:
The TSIN expanded opportunities to sharpen leadership and STEM skills through professional development in all regional STEM Innovation Hub areas. Each hub was sub-granted funds to provide professional development for the state’s teachers during the summer of 2018. In totality, 33 professional development workshops were conducted by the TSIN regional STEM Innovation Hubs, with 1,095 K-12 educators from 136 districts participating.

In addition, the TSIN continued the Innovative Leaders Institute (ILI) for a fourth consecutive year. Thirty-two leaders from 12 school districts participated in the ILI Cohort 4. The ILI is a year-long training and mentoring experience for educators that is led by some of the top innovative school leaders in the state. The ILI provides participants opportunities to network with other building-level leaders from across the state to construct a cadre of innovative thinkers and leaders, visit innovative schools to examine different models of STEM integration, and share best practices and resources with the expectation of immediate impact. Participants in the ILI are required to submit competitive applications that must include a building-level team of a principal or assistant principal, and a lead teacher to strengthen the impact of the ILI on their respective schools. The ILI is approved for TASL credit by the TDOE.

### INNOVATIVE LEADERS INSTITUTE DISTRICT PARTICIPATION

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<tr>
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<td>Bradley County Schools</td>
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<tr>
<td>Bristol City Schools</td>
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<tr>
<td>Clarksville-Montgomery County Schools</td>
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<td>Jackson Christian School</td>
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<td>Johnson City School</td>
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<td>Kingsport City Schools</td>
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<td>Knox County Schools</td>
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<td>Metro Nashville Public Schools</td>
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<td>Oak Ridge Schools</td>
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<td>Putnam County Schools</td>
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<td>Shelby County Schools</td>
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<td>Sullivan County Schools</td>
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<td>Sumner County Schools</td>
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<tr>
<td>Tullahoma City Schools</td>
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**GRAND TOTAL: 120**

Innovative Leaders Institute Instructors and Cohort 4
The Grantee, through TSIN, shall facilitate the establishment of two additional STEM innovation hubs – a physical hub to be located in Northwest Tennessee (established 2015) and a hub specifically dedicated to serving the rural areas of the state.

OUTCOME:
TSIN established a regional STEM innovation hub in Northwest Tennessee and commissioned a rural needs analysis to inform the establishment of a hub specifically dedicated to serving the rural areas of the state during the 2015-2016 fiscal year.

The rural needs analysis, conducted by STEM Innovations, Ltd., solicited feedback on programmatic gaps and issues with geographical access to hub activities and was used to inform the TSIN’s rural support and outreach. The study identified the following areas of highest need:
1. Leadership development
2. Teacher instructional strategies
3. Opportunities for educators to collaborate across regions

In 2017-2018, the TSIN scaled lessons learned and launched the Tennessee Rural STEM Collaborative (TRSC), a program designed to develop teacher leadership capacity, strengthen innovative instructional strategies, and provide a collaborative network for educators in rural areas. In the 2017-2018 pilot year, 43 diverse educators from 24 counties were selected to participate in the program. The program consisted of three in-person convenings, two virtual sessions, and in-class implementation of a STEM initiative that focused on one of three areas: curriculum development, community partnerships, and family engagement. The training sessions were conducted with an extended period of time between sessions, allowing educators to implement and reflect upon the strategies presented. Each participant planned a targeted STEM initiative to pilot in their local context and were provided a stipend to support implementation.

Educators participated in the following development activities: partnership development strategies, problem/project-based learning training, STEM industry tours, and leadership development strategies. The TRSC pilot provided the opportunity for educators across Tennessee to learn STEM best practices, develop a comprehensive network of educators and community partnerships, and implement a targeted STEM initiative in their home community. Example initiatives included the planning of district wide STEM nights, partner supported instructional units, and work-based learning activities for students. In all, these initiatives impacted 8,895 students across Tennessee by exposing them to 21st Century Skills, STEM tools and technologies, and local STEM career pathways.

What type of support do you believe will have the greatest impact on STEM in your classroom?

85%
WOULD LIKE: Community/Industry Partner Support

81%

What type of development opportunities would you be most interested in?

60%
WOULD LIKE: More Networking and Collaboration Opportunities
STEM Excellence Awards

The STEM Excellence Awards are designed to recognize a phenomenal teacher, a leader of a school, a district, or a regional/state organization, and an exceptional advocate for STEM education. Tennessee’s recent successes in STEM are due to the combined efforts of exemplary teachers in the classroom, innovative school and district/regional leaders, and advocates that place STEM on the top of their priority list. The STEM Excellence Awards seek to recognize one awardee in each of the following areas: Excellence in STEM Teaching, Excellence in STEM Leadership, and Excellence in STEM Advocacy. Awardees were honored at the 2018 Tennessee STEM Innovation Summit.

Goals of the Program

• Promote effective teaching strategies by recognizing and rewarding quality STEM teachers
• Highlight effective advocacy partnerships at the local and state levels
• Share strategies for creating an innovative STEM culture within a school building/district/region

Tennessee STEM Innovation Summit

The Tennessee STEM Innovation Summit, designed to further the sharing of promising practices across the state, was held in May in Nashville. More than 400 educators and leaders attended the sold-out event. This year, the Tennessee STEM Innovation Summit was jointly hosted by STEMx, a multi-state STEM network composed of 19 states that share in the TSIN’s mission to make STEM accessible to all. Over 50 STEM leaders from STEMx attended the event, to showcase promising practices in the classroom that are inspiring the next generation of innovators and thinkers.

Visiting Planetarium Program

As an in-kind contribution through its corporate philanthropy focus on STEM education, Battelle Memorial Institute contributed $25,000 to the TSIN to enable the deployment of a visiting planetarium program to rural schools across the state. Billy Hix, Associate Professor of Education at Motlow State Community College, coordinated and led the program’s planetarium visits to 12 rural schools during the 2017-2018 academic year, reaching 3,543 students. Schools selected for visits were geographically isolated, located in high-poverty areas, or lacked the resources for school field trips. During each visit, Professor Hix led a full program related to the study of the solar system, engaging students through standards aligned discussions.

MakerMinded

Sponsored by Lightweight Innovations for Tomorrow (LIFT) and the Tennessee STEM Innovation Network (TSIN), MakerMinded is a digital platform that connects Tennessee students to leading-edge STEM and advanced manufacturing education experiences, while harnessing competition to increase participation. With each completed STEM activity, schools earn points on a live leaderboard. To earn points, students find and engage in MakerMinded opportunities and critically reflect upon their experiences. At the end of the year, schools that have earned the most points are recognized at the Tennessee STEM Innovation Summit and win high-tech, in-demand prizes. The TSIN manages the outreach to schools, development of new activity partnerships, and evaluation of student submissions to the website. Since its launch, 177 schools participated in the MakerMinded program, submitting over 2,200 unique activities with 2,276 active users.

Tennessee Valley Authority STEM Mini-Grants Program

The Tennessee Valley Authority (TVA) partnered with the TSIN to offer STEM-focused mini-grants to inspire innovative classrooms across the state. TVA contributed $30,000 to fund the program and with the network’s help, 18 schools received funding amounts between $500 and $2,000 to launch new STEM projects in the classroom.

STEMx

The STEMx network is a multi-state STEM network developed for states, by states. This grassroots movement provides an accessible platform to share, analyze, and disseminate quality STEM education practices and tools across states. TSIN is a founding member state of STEMx and frequently shares Tennessee’s STEM models and practices with a national audience. Participation in STEMx is provided as an in-kind contribution from Battelle and used as a way to infuse promising STEM practices utilized by other states into the work of the TSIN.

100kin10

As the designated representative of the Tennessee Department of Education’s STEM efforts related to 100kin10, TSIN’s Director participated in the Partner Summit held in January 2018 at the Arizona Science Center in Phoenix. 100kin10’s mission is “to train and retain 100,000 quality STEM teachers over the next 10 years.” TDOE’s commitment to 100kin10 focuses on the retention of quality STEM teachers, utilizing the network’s outreach to provide professional development and leadership strategies to the state’s educators.
STEM EXECUTIVE COUNCIL

In 2017, the TSIN launched the STEM Executive Council to meet twice per year with the objective of engaging leaders to drive a greater collective impact toward advancing science, technology, engineering, and mathematics opportunities in Tennessee. The council connects business and education to provide input regarding essential skills that students need to be successful and to work to strengthen partnerships that extend student learning beyond the classroom walls. Fourteen executives from leading STEM industries and organizations agreed to charter the council to more fully advance STEM across Tennessee.

JAKE BASDEN
Vice President of Publicity & Corporate Communications
Big Machine Label Group

JOEY HATCH
Executive Vice President
Skanska USA Building Inc.

PATRICK LOWRY
Vice President Technology & Innovation
HCA/HealthTrust

LAWRENCE BLANK-COOK
National Technology Director
Deloitte

HEATH HOLTZ
Vice President of Vehicle Manufacturing Supply Chain Management & Purchasing
Nissan Motor Corporation

DR. CANDICE MCQUEEN
Commissioner
Tennessee Department of Education

GRANT BOYD
Senior Vice President of Business Development
The Trust Company of Tennessee

BRADLEY JACKSON
President & CEO
Tennessee Chamber of Commerce & Industry

CISCO SANCHEZ
Vice President Enterprise Foundational Services
FedEx

BOB DEACY
Senior Vice President
Generation Construction Projects, and Services
TVA

DR. AIMEE KENNEDY
Sr. Vice President of Education Philanthropy and STEM Learning
Battelle

STATE SENATOR BO WATSON
(R) – Hixon

STATE REP. BRENDA GILMORE
(D) – Nashville

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