**Tennessee STEM Innovation Network (TSIN)**

The TSIN was built on over a decade of research into successful state-wide STEM collaborations and seeks to nurture and scale effective science, technology, engineering, and math (STEM) learning opportunities for all K-12 students in Tennessee.

Our goals are to inform the STEM education field about the importance of creating industry-connected, STEM-rich learning opportunities for students and their families across K-12 that in-turn generates interest in the STEM educational continuum from preschool through higher education and workforce.

**Workforce Initiative Goals**

To support Governor Lee’s FWI to increase STEM training in K-12 schools, the TSIN and TDOE partnership has prioritized the below three areas of emphasis to move Tennessee to the top 25 states for job creation in the technology sector by 2022.

**INCREASE EXPOSURE TO STEM**

Launching **new CTE programs** focused in STEM fields with 100 new middle school programs and **tripling the number of STEM-designated public schools by 2022**.

**INCREASE EDUCATOR CAPACITY**

Growing the number of teachers qualified to teach work-based learning and advanced computer science courses through **STEM teacher training and implementation of K-8 computer science standards**.

**INCREASE ENGAGEMENT**

Expanding postsecondary STEM opportunities in high school through increased access to dual credit, **AP courses**, and dual-enrollment.
Future Workforce Initiative (FWI) Implementation

The TSIN team greatly values tracking implementation targets along the way. Therefore, we have identified the major areas of focus in our work that align with Governor Lee’s goals. Based on the 2019-2020 academic year, the FWI impact is far-reaching. Below are key data points that highlight this work.

1. Launching new CTE programs focused in STEM fields – TSIN and TDOE partnered to create a new STEM CTE teacher online training course for all 6 STEM Programs of Study. **Number of teachers trained to teach STEM CTE Programs of Study = 209.**

2. Growing the Number of Teachers Qualified to Teach Advanced Computer Science – Implementing the Code.org and K8 Digital Readiness Standards training across TN. **Number of teachers trained in 2020 = 232.**

3. Increasing Access to AP Computer Science Courses – Through Code.org, TSIN and TDOE have trained **124 teachers in AP Computer Science Principles,** expanding the number of CSP course offerings by 76% across Tennessee (15 schools in 2017-18 to 63 schools in 2020-21).

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<tr>
<th>Partnered with Vanderbilt to evaluate the STEM School Designation Process</th>
<th>Expanded TSIN Staff Capacity through Regional Consultants for Each Grand Division</th>
<th>Managed the Code.org Professional Learning Program</th>
<th>Computer Science Grants to Code.org Trainees Supporting AP Courses</th>
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<tr>
<td>Created K8 Computer Science Standards Training</td>
<td>Supported the TN STEM Innovation Summit Conference</td>
<td>Sustainability Grants to STEM Designated Schools</td>
<td>Scaled the STE(A)M Resource Hub to Support Teachers Statewide</td>
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<td><em>postponed to May 2021</em></td>
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FWI Impact Stories

- **COVID-19 STE(A)M Resource Hub** – To support teachers during the spring school shutdowns, we created an online resource repository for grades 3-12 that focus on STEM exploration and careers in TN. "These resources are amazing. I am using them as enrichment through Canvas during online learning. My students are engaged, even when learning from home. Please keep creating new activities - I’m saving so much time with lesson planning.” 5th Grade Teacher

- **Designated Schools Sustainability Grants** – Each of the 22 schools that earned Tennessee STEM School Designation for the 2019-2020 academic year was provided a generous grant in the amount of $10,000 to expand STEM educational experiences for students and teachers. "We can double our STEM efforts with this funding! Thank you.” Audra Block, Memphis Academy of Science and Engineering

- **STE(A)M Summer Resource Hub** – To combat the ‘summer-slide’, we continued providing STEAM activities and resources for students throughout the summer months that align to 6 major CTE pathways and growing industries in TN. "I liked the varied activities by CTE cluster and accessibility to a variety of hands-on, offline, and online learning experiences for my students. Thank you!” 8th Grade Teacher

- **New CTE STEM Teacher Training** – Created an online course for new CTE educators that explore 6 STEM core competencies to strengthen teacher capacity for these courses: STEM Explorers, STEM Innovators, STEM Career Exploration, BioSTEM, Engineering and Technology, and Advanced STEM Applications. "I loved the multiple formats of learning used in this EdX STEM course. The combination helped deepen my understanding of STEM programs of Study.” STEM I-IV Teacher, Chattanooga, TN
Statewide Impact

98% of teachers are more confident in identifying computational thinking after TSIN training

215,247 TN Students impacted through TSIN programmatic outreach in the 2019-20 academic year

FWI Impact Stories

- **Code.org Regional Partnership Program** – The Code.org professional development program supports efforts to expand equitable access to computer science in K-12 schools through a one-year cohort approach for teachers through K-5 CS Fundamentals, 6-10 CS Discoveries, 9-12 CS Principles. "I've learned so much about CS through this program. The networking & deep dive into CS concepts has increased my capacity tremendously." Molly Plyler, K-12 STEM Teacher, Jackson, TN

- **K-8 Digital Readiness Standards Training** – The K-8 Computer Science Standards were broken into 3 courses for K-2, 3-5, & 6-8 educators. New workshops were added to support school counselors & administrators as they support teachers at the school building level. "This course not only increased my self-confidence in the CS curriculum, but it also opened my eyes to the many connections between CS and the core subjects that I already teach." 5th Grade Teacher

- **Computer Science Educator Grants** – Participants who completed the year-long Computer Science Discoveries (6-10) & Computer Science Principles (AP CSP 9-12) programs also received generous stipends & classroom materials to further support computer science implementation at their schools. "The materials I received to support CS are phenomenal! My kids can actually apply what they've learned. Thank you!" 11th Grade Teacher
TSIN's 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

TSIN 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 across the state.

Expanding Computer Science

Computer Science continues to be a priority for the Network. In addition to the WFI programs and outreach, we’ve supported CS expansion statewide through the following activities in partnership with the TN Department of Education.

Public Chapter 454
TSIN contributed to the work led by the Department of Education to craft recommendations for Tennessee’s PC454 around the future of Computer Science Education in our state. You can review the Tennessee Computer Science State Plan here.

Computer Science Teaching Association (CSTA) TN Chapter
To reduce CS teacher isolation, TSIN launched a statewide chapter of CSTA, which successfully got a charter approved, a slate of officers elected, and currently boasts 63 members since forming in April 2020.

Building Formal CS Partnerships Nationally
The Network created formal partnerships with ISTE (International Society for Technology in Education), CS4ALL (Computer Science for All), and Girls Who Code. Overall, the goal is to offer a comprehensive and visible presence for Computer Science education as part of the STEM experience for all TN learners.
Looking Ahead

The Network has seen incredible interest in continuing each program funded through the Future Workforce Initiative. Schools and districts across the state have come to rely on this work as a vital component of their STEM professional learning and wrap-around support system. We invite you to attend our upcoming events and trainings.

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<tr>
<th>Date</th>
<th>Upcoming Event</th>
<th>Audience</th>
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<td>Week of Dec 7, 2020</td>
<td>Computer Science Week Kick Off Event</td>
<td>K-12 Stakeholders, Legislators, Industry Partners</td>
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<tr>
<td>Spring 2021</td>
<td>STEM for All Event</td>
<td>K-12 Stakeholders, Legislators, Industry Partners</td>
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<td>May 10-11, 2021</td>
<td>Tennessee STEM Innovation Summit</td>
<td>K-12 Stakeholders - over 600 educators and administrators</td>
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<td>Summer 2021</td>
<td>FWI Training Sessions for CS and STEM</td>
<td>K-12 Stakeholders - host over 1,000 educators</td>
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