The Center for Science, Technology, Engineering and Mathematics Education (STEM) is to promote a regional vision for STEM education and outreach, to increase capacity in leadership, and to facilitate collaborative partnerships for addressing STEM priorities for PreK-20.

This report highlights our efforts focused on addressing STEM teaching and learning needs and providing a voice for STEM education.
The Center launched a summer enrichment institute for grades 5 -7 focusing on computational thinking. The week-long experiences was led by Premkumar Pugalenthi, STEM Education Specialist (CSTEM) and co-designed with Alisa Wickliff, Associate Director (CSTEM). Students explored the interface between coding and electronics using Ozobots evo, Pro-Bots, Makey Makey, Activity Bot 360 and more. The week long institute ended with a showcase for parents and university faculty and staff.

The STEM Pre-College Program served approximately 126 students during the summer including 8 students in the Summer Research Experience. The summer STEM program provides students with enrichment activities and hands-on activities. The Research Experience pairs students with STEM faculty who mentor them in their research labs for five weeks.

In September over 650 fifth grade students from Mecklenburg, Lincoln and Gaston County Schools participated in the annual Catawba River STEM Festival. The educational event is co-sponsored by the Center, the Energy Explorium, and Duke Energy.

Yolanda Brown, CSTEM Administrative Assistant, assisted the College Board in delivery professional development to their Cvent Cohort 3 group in Reston, VA. Ms. Brown was selected to provide expertise on setting up and using the Cvent system for Advanced Placement (AP) summer institutes. She was selected because of her mastery of the process as part of Cohort 2.

Through support from an I3 federal grant received by Cabarrus County Schools, the Center has been able to offer a second cohort of teachers an online professional development opportunity “Foundations of Problem-Based Learning”. An additional cohort is planned for summer. This 45-hour professional development offering supports the district’s efforts to build a powerful STEM pipeline from Pk-12.

The Center is sponsoring a second year of the STEM Education Leadership Professional Learning Community. STEM Education Leaders from multiple districts meet for day-long opportunities to share, learn, and develop leadership capacity that supports STEM school development and recognition.

Dr. Fernandes (PI, Mathematics) along with Co-PIs Dr. Pugalee (CSTEM) and Dr. Harris (Mathematics) received a NSF Noyce grant. The UNC Charlotte CResT (Culturally Responsive Teaching) Program supports outstanding mathematics, science, and engineering students in becoming middle and high school mathematics teachers through the Robert Noyce Teacher Scholarship. The program supports scholarships and activities in two content specializations, one of them being mathematics, or obtain a B.A./B.S. in mathematics with a secondary mathematics licensure.

The 2018 Advanced Placement Summer Institutes provided 30 hours of professional development for 216 teachers from across the country. Teachers completing the program receive recognition from the College Board as teachers for Advanced Placement in their subject of preparation.
Review of Our Work

1490 HOURS through CSTEM provided professional development, coursework, enrichment activities, consultation with faculty, competitions, and other support.

2094 NUMBER OF INDIVIDUALS SERVED through CSTEM activities and events

Number of Individuals served through CSTEM activities and events
## Grants

<table>
<thead>
<tr>
<th>Awarded Grants</th>
<th>Amount</th>
<th>Funder</th>
<th>PI</th>
<th>Co-PIs</th>
</tr>
</thead>
<tbody>
<tr>
<td>AEOP Strategic Partner Grant</td>
<td>$50,000</td>
<td>AEOP</td>
<td>Alisa Wickliff</td>
<td>Lisa Rhodes/SMT</td>
</tr>
<tr>
<td>NC JSHS</td>
<td>$21,000</td>
<td>Triservices</td>
<td>Alisa Wickliff</td>
<td>Dr. David Pugalee</td>
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<tr>
<td>Noyce 49er Teach</td>
<td>$698,123</td>
<td>National Science Foundation</td>
<td>Dr. David Pugalee</td>
<td>Dr. Kathy Asala, Chemistry; Dr. Pedram Leilabady, Physics; Dr. Michelle Stephan (MDSK; Mathematics); Dr. Warren DiBiase (MDSK)</td>
</tr>
<tr>
<td>Noyce Culturally Responsive Teaching (CResT)</td>
<td>$1,194,928</td>
<td>National Science Foundation</td>
<td>Dr. Anthony Fernandes (Mathematics)</td>
<td>Dr. Kim Harris (Mathematics) &amp; Dr. David Pugalee</td>
</tr>
<tr>
<td>Collaborative Research: Broadening Participation with the STEM Ecosystem, Developing a Scalable Model Using a RPP Approach</td>
<td>$497,176</td>
<td>National Science Foundation</td>
<td>Dr. Mary Lou Maher (Computing and Informatics)</td>
<td>Drs. Mohgsen Dorodchi, Lijuan Cao &amp; Audrey Rorrer (Computing and Informatics), Dr. David Pugalee</td>
</tr>
<tr>
<td>5E Model of Professional Development in Science Education for Special Educations</td>
<td>$270,764</td>
<td>US Department of Education</td>
<td>Dr. Shawnee Wakeman (PI, Special Education and Child Development)</td>
<td>Dr. David Pugalee</td>
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<tr>
<td>AEOP REAP</td>
<td>$6,500</td>
<td>AEOP</td>
<td>Dr. David Pugalee</td>
<td>Dr. Shagutta Raja, Alisa Wickliff</td>
</tr>
</tbody>
</table>

### Grant Evaluation

Dr. David Pugalee

Camp Invention, Burroughs Welcome Fund, Charlotte-Mecklenburg Schools
IPASS, National Science Foundation, College of Computing and Informatics
UNCC S-STEM Engineering Academic Pathways, National Science Foundation, College of Engineering
PUBLICATIONS

Dissertations


PRESENTATIONS


Wickliff, A. (September 2018) STEM Schools of Recognition, *STEM Education Leadership PLC*, UNC Charlotte, Charlotte, NC

Raja, S. (September 2018) Pre-College STEM Program, *STEM Education Leadership PLC*, UNC Charlotte, Charlotte, NC
Selected Activities

CERME11, Premkumar Pugalenthi, Peer Reviewer
Charlotte Area Science Network, Alisa Wickliff, Board Secretary
Council for the Accreditation of Educator Preparation, David Pugalee, Team Chair
Mathematics into the 21st Century Project International Programme Committee, David Pugalee, Member
National Science Teachers Association 2018 Alisa Wickliff, Co-Chariman Charlotte NSTA Regional
North Carolina Science and Engineering Fair Foundation Board, Alisa Wickliff, Regional Director
North Carolina Science and Engineering Fair Foundation Board, Sarah Smith, Member
North Carolina Science Leadership Association Board/Executive Board, Alisa Wickliff, Past President
North Carolina Science Olympiad Advisory Board, NCSU, Alisa Wickliff, Member & Communications Chair
North Carolina Student Academy of Sciences Advisory Board, Alisa Wickliff, Member
Regional Director Advisory Council to Junior Science and Humanities Symposium, Alisa Wickliff, Member
Symposium for Elementary Mathematics Teaching International Conference Advisory Board, David Pugalee, Member
Urban Education Research and Policy Annuals (UERPA), Premkumar Pugalenthi, Peer Reviewer
ZDM Mathematics Education, David Pugalee, Guest Reviewer
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