ASTE
Southwest Regional Conference

October 3, 2015
Denton, TX
Table of Contents

Schedule of Events ........................................................................................................ 2
Presentation Schedule .................................................................................................... 3
Paper Presentations ....................................................................................................... 7
  Construction of Scientific & Mathematical Thinking in Pre-service Science Teachers .......... 7
  Using Required Targeted Content Courses to Prepare Elementary Education Majors to Teach Science 7
  Recruiting Teachers: A Review of Recent Literature ........................................................................................................ 7
  Bats, Bats, Bats, Bats, and Pre-service Teacher Candidates Too .............................................. 8
  Building a Summer Genetics Learning Community ................................................................ 8
  Lesson’s Learned from America’s Only Online STEM Education PhD Offered by a Research University .. 9
  Facilitating Organizational Change through Global Collaboration in a School District ............... 9
  Toward a Framework for Culturally Relevant Inquiry-based Science Pedagogy ................. 10
  Effects of NSF GK-12 Resident Scientists on Student Attitudes: A Five -Year Study ...................... 10
  Selecting, Adapting, and Implementing Case Studies for the Science Classroom .................. 10
  Food Chain Jenga: Using Models to Test Predictions ........................................................... 11
  Inquiry Immersion for Content Understanding Prior to a High School Freshman Biology Class. 11
  Exploring the Effectiveness of Curriculum Provided Through Transmedia Books for Increasing Students’ Knowledge and Interest in Science ................................................................. 11
  The Effects of Professional Development on Student Test Scores ........................................ 12
  Developing a Core Research Facility for K-12 and Teacher Education ................................. 12
  Five lessons science education researchers and teachers can learn from John Dewey’s (1929) The Sources of a Science of Education ................................................................. 12
Round Table Discussions ............................................................................................... 13
  OK STEM Centers: A Regional Professional Development for Teachers ........................................ 13
  Creating an Effective Network for STEM Teacher Recruitment ........................................ 13
  What Knowledge and Skills Do STEM Teachers Need to Be Effective? .............................. 13
  Global Collaboration in Science Education ........................................................................... 14
  Using Wordles as the Visual Data to Explore Prospective Elementary Teachers’ Perceptions of Informal Science Education ................................................................. 14
  Coaching as a Professional Development Model: At What Cost? ........................................ 14
  Using the NSTA Learning Center as an E-Text, Portfolio, and Induction Tool ....................... 15
Presenter Contact Information ........................................................................................ 16
Maps ....................................................................................................................... 17
Index ....................................................................................................................... 20
<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Friday October 2nd</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3:00</td>
<td>Hotel and conference check-in</td>
<td>Holiday Inn and Suites</td>
</tr>
<tr>
<td>6:00</td>
<td>Dinner and Oktoberfest (on your own)</td>
<td>Denton Square</td>
</tr>
<tr>
<td><strong>Saturday October 3rd</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Breakfast (Included in hotel cost for guests)</td>
<td>Holiday Inn and Suites</td>
</tr>
<tr>
<td>8:00</td>
<td>Conference check-in</td>
<td>Gateway Center, Room 43/47</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Please park across the street</td>
</tr>
<tr>
<td></td>
<td></td>
<td>from the Gateway Center in Lot</td>
</tr>
<tr>
<td></td>
<td></td>
<td>20 on North Texas Blvd.</td>
</tr>
<tr>
<td>8:15</td>
<td>Paper Presentations</td>
<td></td>
</tr>
<tr>
<td>12:05</td>
<td>Business Lunch (Included in registration)</td>
<td></td>
</tr>
<tr>
<td>1:00</td>
<td>Roundtable presentations</td>
<td></td>
</tr>
<tr>
<td>1:30</td>
<td>Paper Presentations</td>
<td></td>
</tr>
<tr>
<td>3:45</td>
<td>Closing</td>
<td></td>
</tr>
<tr>
<td>4:30</td>
<td>Board Meeting</td>
<td>Holiday Inn and Suites</td>
</tr>
<tr>
<td>6:00</td>
<td>Dinner (included in registration)</td>
<td>Horny Toad Cafe</td>
</tr>
<tr>
<td>8:00</td>
<td>Star Party (Included in registration)</td>
<td>UNT Observatory</td>
</tr>
</tbody>
</table>
# Presentation Schedule

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
<th>Presenter(s)</th>
<th>Affiliation</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:00</td>
<td>Welcome</td>
<td>Dr. Kelly Feille</td>
<td>University of North Texas</td>
<td></td>
</tr>
<tr>
<td>8:15</td>
<td>Paper Presentation</td>
<td>Dr. Jane Metty</td>
<td>Mercer University</td>
<td>Construction of Scientific &amp; Mathematical Thinking in Pre-service Science Teachers</td>
</tr>
<tr>
<td>8:35</td>
<td>Paper Presentation</td>
<td>Dr. Madelon McCall Dr. Suzanne Neismith</td>
<td>Baylor University</td>
<td>Using Required Targeted Content Courses to Prepare Elementary Education Majors to Teach Science</td>
</tr>
<tr>
<td>9:05</td>
<td>Paper Presentation</td>
<td>Dr. Dionne Jackson</td>
<td>Hendrix College</td>
<td>Recruiting Teachers: A Review of Recent Literature</td>
</tr>
<tr>
<td>9:25</td>
<td>Paper Presentation</td>
<td>Dr. Matt Seimears Crystal Allman</td>
<td>Emporia State University</td>
<td>Bats, Bats, Bats, Bats, and Pre-service Teacher Candidates Too</td>
</tr>
<tr>
<td>9:45</td>
<td>Paper Presentation</td>
<td>Christina Goodchild Dr. Julie Westerland</td>
<td>Texas State University</td>
<td>Building a Summer Genetics Learning Community</td>
</tr>
<tr>
<td>10:05</td>
<td>Paper Presentation</td>
<td>Dr. Walter Smith Dr. Dan Carpenter</td>
<td>Texas Tech University</td>
<td>Lesson's Learned from America's Only Online STEM Education PhD Offered by a Research University</td>
</tr>
<tr>
<td>10:45</td>
<td>Paper Presentation</td>
<td>Dr. Vanessa Dodo Seriki</td>
<td>Loyola University Maryland</td>
<td>Toward a Framework for Culturally Relevant Inquiry-based Science Pedagogy</td>
</tr>
<tr>
<td>11:05</td>
<td>Paper Presentation</td>
<td>Lisa Hanson Dr. Julie Westerland</td>
<td>Texas State University</td>
<td>Effects of NSF GK-12 Resident Scientists on Student Attitudes: A Five-Year Study</td>
</tr>
<tr>
<td>11:25</td>
<td>Paper Presentation</td>
<td>Dr. Sandra Westmoreland</td>
<td>Texas Woman's University</td>
<td>Selecting, Adapting, and Implementing Case Studies for the Science Classroom</td>
</tr>
</tbody>
</table>
11:45  Break

12:05  Business Lunch

12:30  Roundtables

- OK STEM Centers: A Regional Professional Development for Teachers
  Presenter: Elizabeth Allan, University of Central Oklahoma
- Perspectives on Science Teacher Professional Development: A study of the enhancement of astronomy teachers’ pedagogical content knowledge (PCK) through the ASSET experience
  Presenter: Andrea Foster, Sam Houston State University
  Co-Presenter(s): Katrina Reeve SHSU
- Creating an Effective Network for STEM Teacher Recruitment
  Presenter: Dionne Jackson, Hendrix College
- What Knowledge and Skill Do STEM Teacher Need to Be Effective?
  Presenter: Jane Metty, Mercer University
- Global Collaboration in Science Education
  Presenter: Jill Nugent, Texas Tech University
  Co-Presenter(s): Linda Cook Texas Tech University & Coppell ISD
  Meredith Bell Texas Tech University and Frisco ISD
- Using Wordles as the Visual Data to Explore Prospective Elementary Teachers’ Perceptions of Informal Science Education
  Presenter: Sumreen Asim, UNT
- Coaching as a Professional Development Model: At What Cost?
  Presenter: Erin Pearce, Texas Christian University
  Co-Presenter(s): Beau Hartweg Texas Christian University
  Yohanis de la Fuente, TCU
- Using the NSTA Learning Center as an E-Text, Portfolio, and Induction Tool
  Presenter: Michael Odell, University of Texas at Tyler
<table>
<thead>
<tr>
<th>Time</th>
<th>Session Type</th>
<th>Authors/Institutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:15</td>
<td>Paper Presentation</td>
<td>Daniella Biffi, Beau Hartweg, Melissa Patterson, Morgan Stewart, Yohanis de la Fuente, Dr. Eric Simanek, Dr. Molly Weinburgh, Texas Christian University</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Food Chain Jenga: Using Models to Test Predictions</td>
</tr>
<tr>
<td>1:45</td>
<td>Paper Presentation</td>
<td>Dr. Leann Snell-Burke, Dr. Melissa Hulings, Tracy Campbell, Raylynn Jansing, Dr. Yolanda Parker, University of Texas Arlington</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Inquiry Immersion for Content Understanding Prior to a High School Freshman Biology Class.</td>
</tr>
<tr>
<td>2:05</td>
<td>Paper Presentation</td>
<td>Dr. Pamela Ponners, Sumreen Asim, University of North Texas</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Exploring the Effectiveness of Curriculum Provided Through Transmedia Books for Increasing Students’ Knowledge and Interest in Science</td>
</tr>
<tr>
<td>2:25</td>
<td>Paper Presentation</td>
<td>Dr. Becky Sinclair, Dr. Gil Naizer, Texas A&amp;M Commerce</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The Effects of Professional Development on Student Test Scores</td>
</tr>
<tr>
<td>2:45</td>
<td>Paper Presentation</td>
<td>Dr. Michael Odell, Dr. Teresa Kennedy, University of Texas Tyler</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Developing a Core Research Facility for K-12 and Teacher Education</td>
</tr>
<tr>
<td>3:05</td>
<td>Paper Presentation</td>
<td>Melissa Patterson, Texas Christian University</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Five lessons science education researchers and teachers can learn from John Dewey’s (1929) The Sources of a Science of Education</td>
</tr>
<tr>
<td>3:25</td>
<td>Closing</td>
<td>Dr. Kelly Feille</td>
</tr>
</tbody>
</table>
Abstracts

*Abstracts include hyperlinks to papers, presentation PowerPoints, and handouts when available.
Construction of Scientific & Mathematical Thinking in Pre-service Science Teachers
Presenter: Dr. Jane Metty, Mercer University

Abstract:
Essential skills pre-service science teachers need is the ability to think critically and analytically. After all, if they can't think their way out of a paper bag, how will they teach their students to analyze and problem solve? NGSS and CCSS for mathematics outline eight discipline specific practices, which emphasize habits of mind and ways of thinking (model-based reasoning, quantitative and computational reasoning, engineering design and authentic research) necessary to the practice of math and science (we would argue for all STEM disciplines). This session discusses a course designed for the sole purpose of developing mathematical and scientific reasoning skills in elementary pre-service teachers.

Using Required Targeted Content Courses to Prepare Elementary Education Majors to Teach Science
Presenter: Dr. Madelon McCall, Baylor University
Co-Presenter(s): Dr. Suzanne Nesmith Baylor University

Abstract:
This session will explore a new integrated university level science course targeting elementary education majors. The course was designed to increase the science content understanding as well as science pedagogical knowledge of students seeking elementary education certification. The development of a deep understanding of the scientific concepts required for the effective instruction of elementary school students is critical, and university science courses currently offered did not serve this purpose. The new science course was designed to include an embedded laboratory experience so that students could simultaneously experience inquiry learning and application of new content knowledge. Moreover, the methodology and instructional strategies used to teach the course will serve as a model for the pre-service teachers to use in teaching science to elementary students. The course design, assessment tools, and a sample laboratory experience will be shared.

Recruiting Teachers: A Review of Recent Literature
Presenter: Dr. Dionne Jackson, Hendrix college

Abstract:
Research articles were reviewed to determine the reasons why people choose to teach, and what these reasons imply for the recruitment of future teachers. The nine articles revealed six themes for the reasons why people enter teaching: a desire for social justice; a desire to work with young people; the influence of role models and mentors; the influence of informal teaching internships; preconceptions about teaching; and financial support. There were four implications for the recruitment of students into teacher preparation: the importance of providing field experiences, knowing students’ prior experiences and addressing preconceptions, fostering networking, and appealing to students’ desires to make a difference. These findings suggest important factors that teacher preparation programs, including programs that recruit and prepare students to become science teachers, should consider regarding the recruitment of future teachers.
Bats, Bats, Bats, Bats, and Pre-service Teacher Candidates Too

**Presenter:** Dr. Matt Seimears, Emporia State University

**Co-Presenter(s):** Crystal Allman Emporia State University

**Abstract:**

Dr. C. Matt Seimears from Emporia State University took pre-service teacher candidates to study bats in Oklahoma in August 2015. The “Data Analysis Experience of the Mexican Free Tailed Bat, provide STEM professional development through academic enhancement field experiences for Blocks I and II students through a forged partnership with Emporia State University and The University of Northern Oklahoma.

Students that participated in this experience increased their professional development in STEM as a future educator, experienced thematic strands in scientific modeling, lesson planning development, structures of Earth/Space Science, energy, and the use of technology (UNO faculty training – by Mamaologist’s ), to design and develop thematic units as well as lesson plans from their experiences in the caves. All students that participated in the project used a hands-on EPSCoR curriculum to plan and assess their own strategies through a hands-experience. This presentation will share ways and strategies to help others duplicate the same experience on a low cost budget.

Building a Summer Genetics Learning Community

**Presenter:** Christina Goodchild, Texas State University

**Co-Presenter(s):** Dr. Julie Westerlund Texas State University

**Abstract:**

In this two-year study, we have examined the attitudes and the achievement of undergraduate students taking a summer genetics course for science and science education majors. The purpose of this study is to determine which strategies were most effective in a fast-paced summer course. The summer classes took place in 2014 (n=59) and 2015 (n=60), and extended over an eight week period each summer. Prior to the onset of the eight week traditional lecture portion of the course, there was a three week “May-mester” portion that consisted of self-instruction. Over the combined 11 weeks, a multitude of strategies were used to teach genetics and to build a positive learning community. Some of these strategies included step-by-step genetics problem-solving Educreations videos, small group break-out discussion sessions and physical modeling using manipulatives of complex genetic concepts such as gene regulation. A cultivation of a spirit of “being in this together” and “helping each other” was a major goal to promote student success. Approximately every 2 weeks, students’ attitudes about effective strategies were assessed with both open and closed ended questionnaires. We also interviewed students during the following fall semester concerning the effectiveness of the course strategies. The students’ understanding of the genetics concepts was measured by administering the Genetics Concept Assessment at the beginning and the end of the course. The study is relevant to those in the science education field interested in effective undergraduate science courses for future science teachers.
Lesson's Learned from America's Only Online STEM Education PhD Offered
by a Research University

Presenter: Dr. Walter Smith, Texas Tech University

Co-Presenter(s): Dr. Dan Carpenter Texas Tech University

Abstract:

STEM’s teacher education continuum extends from pre-service programs to in-service professional development. At the continuum’s top end lies doctoral study for seasoned STEM educators. Texas Tech has three years’ experience with America's only online PhD in STEM education offered by a research university. Here we report on lessons learned and future directions.

We have three cohorts of 19 students who started in 2012 and have entered the dissertation phase after three years of coursework, 26 who started in 2013 and have completed two years, and 28 who just began coursework. The program includes three years of coursework at 18 credit hours per year followed by a year of dissertation. They’re on-campus two weeks each of three summers and also attend a different national conference each year.

Since they are all fulltime educators, their jobs provide a “teaching hospital” to test and practice what they are learning.

They are from China and The Bahamas plus 20 states from the Atlantic to the Pacific with about half scattered around Texas from the Panhandle to the Valley.

All have had three to 30 years’ experience teaching science K-12 or comparable informal roles. About half are classroom teachers, a third are STEM education specialists and the remainder are in related jobs.

All students pay tuition like any other student. We are not grant funded.

We will start a fourth cohort of 25 next fall and every fall thereafter. We have moved from one to now three faculty and will have five by next fall.

Facilitating Organizational Change through Global Collaboration in a School District

Presenter: Terry Sutton, Texas Tech University

Co-Presenter(s): Karen McNallen Texas Tech University

Abstract:

As we grow closer through our advances in technology and Internet infrastructure, the borders between our nations and cultures are becoming only lines on a map. Our students must be prepared to work collaboratively and connect with others globally to address the challenges that affect us all. What professional development models would assist K-12 teachers in bridging global boundaries and open their classrooms to global collaboration? How can a school district realize a vision for building global initiatives?

Many large districts have enlisted a more ‘corporate’ approach to Global Education. The school systems in large cities have a great deal of resources, but how does this vision of global collaboration transfer to smaller school districts or to classrooms of individual teachers.

The purpose of this mixed methods study will address facilitating organizational change in a school district through global collaboration. An embedded design will be used in which quantitative data measured through pre and post assessment using the to measure global competencies of the participants along with qualitative data are embedded with a major design case study. The quantitative data will be used to test the theory that predicts the intervention of professional development, coaching, global project development, and implementation will influence positively the acquisition of global competencies for the participating staff at the school district. The quantitative data will be embedded in this larger design case study before and after the intervention for the purpose of establishing a baseline and measuring any change in global competencies.
Toward a Framework for Culturally Relevant Inquiry-based Science Pedagogy

Presenter: Dr. Vanessa Dodo Seriki, Loyola University Maryland

Abstract:
Culturally relevant pedagogy (CRP), as posited by Ladson-Billings (1994/2009) and Inquiry-based science instruction (Marshall et al., 2010) are two pedagogical approaches that have, separately, been shown to positively influence achievement among students who experience it (Gutstein, Lipman, Hernandez, & de los Reyes, 1997; Lopez, 2011; & Marx, Blumenfeld, Krajcik, Fishman, Soloway, Geier, & Tal, 2004). This conceptual paper merges these two approaches by highlighting the overlap and distinctive features of each. In doing so, I propose a new framework, CRISP, that can be used to aid both preservice and inservice science teachers in creating equitable science classrooms and learning opportunities that allow learners to access and experience high-quality science instruction. This framework will be used to create a classroom observation instrument, that supports teacher professional growth by identifying where their current practices reside and where their practices should be-their goal(s). Creating such a tool places the teacher’s focus on areas in need of improvement that have been shown to have the greatest impact student learning outcomes.

Effects of NSF GK-12 Resident Scientists on Student Attitudes: A Five-Year Study

Presenter: Lisa Hanson, Texas State University

Co-Presenter(s): Dr. Julie Westerlund Texas State University

Abstract:
This study examined secondary student attitudes towards science and NSF GK-12 Project Flowing Waters fellows (“resident scientists”) over five years. In the first three years, a NSF SWEPTS [Scientific Work Experiences for Teachers] student attitude survey was used to survey student [n=609 students] attitudes. In the last two years, a newly developed science attitude survey, My Attitude Toward Science Scale (MATS) was used to survey student [n=1111 students] attitudes. Matched pre and post student attitude surveys were obtained. Both surveys were administered at the beginning and again at the end of the school year. Results indicated significant attitude changes.

Selecting, Adapting, and Implementing Case Studies for the Science Classroom

Presenter: Dr. Sandra Westmoreland, Texas Woman's University

Abstract:
In this workshop members will have the opportunity to participate in a model lesson based on the case study “Water Can Kill: Exploring the Effects of Osmosis,” (Susan D. Hester. National Center for Case Study Teaching in Science). We will discuss how to pick case studies appropriate for your students and how to remodel them to make them user-friendly for both students and teachers. Go home with one new lesson ready to teach right away and, even better, a new method for creating your own lessons using case studies.
**Food Chain Jenga: Using Models to Test Predictions**  
**Presenter:** Daniella Biffi, Texas Christian University  
**Co-Presenter(s):** Beau Hartweg, TCU  
Melissa Patterson, TCU  
Morgan Stewart, TCU  
Yohanis de la Fuente, TCU  
Dr. Eric Simanek, TCU  
Dr. Molly Weinburgh, TCU  

**Abstract:**  
Elementary students interact with models every day without thinking about how accurate or inaccurate the models are. They may not realize that scientists rely heavily on models to depict phenomena in the natural world, communicate thoughts, and to test ideas. We use the Jenga tower as a model to represent a marine food chain. By building a model and enacting the consequences of environmental factors, students (and conference attendees) learn about the delicate balance of the chain.

**Inquiry Immersion for Content Understanding Prior to a High School Freshman Biology Class.**  
**Presenter:** Dr. Leann Snell-Burke, University of Texas Arlington  
**Co-Presenter(s):** Dr. Melissa Hulings UTA  
Tracy Campbell UTA  
Raylynn Jansing UTA  
Dr. Yolanda Parker UTA  

**Abstract:**  
This study sought to examine the effects of a week-long STEM summer camp on student learning of key biology concepts that were connected to the Next Generation Science Standards. Immersing students in science inquiry during a one-week summer camp was our primary goal. Comparison of pre and posttests showed student improvement, especially in the content of DNA and photosynthesis. Strictly using science inquiry during the summer camp contributed to the effectiveness of these activities. Providing inquiry science experiences prior to the students’ Freshman Biology course was what made this a unique opportunity offered by the camp. This project explores the success of specific explorations relevant to their appropriate subject matter and support for the inclusion of inquiry in science.

**Exploring the Effectiveness of Curriculum Provided Through Transmedia Books for Increasing Students’ Knowledge and Interest in Science**  
**Presenter:** Dr. Pamela Ponners, University of North Texas  
**Co-Presenter(s):** Sumreen Asim UNT  

**Abstract:**  
Transmedia books are new and emerging technologies which are beginning to be used in current classrooms. Transmedia books are a traditional printed book that uses multiple media though the use of Quick Response (QR) codes and augmented reality (AR) triggers to access web-based technology. Using the transmedia book Skills That Engage Me students in kindergarten through second grade engage in curriculum designed to introduce science skills and careers. Using the modified Draw-a-Scientist Test (mDAST), observations and interviews, researchers analyzed pre and post data to describe changes students have about science and scientists. Future study may include the development and validation of a new instrument, Draw a Science Student, and examining the mDAST checklist with the intention of updating the parameters of what is considered positive and negative in relationship with work a scientist conducts.
The Effects of Professional Development on Student Test Scores

**Presenter:** Dr. Becky Sinclair, Texas A&M Commerce

**Co-Presenter(s):** Dr. Gil Naizer Texas A&M Commerce

**Abstract:**

This research project investigated the effects of a two-year science professional development program on the standardized assessment scores of students. The fifth grade science teachers in this study had many similarities including their science background knowledge, district curriculum used and student demographics. Four total years of assessments were considered for this project.

Developing a Core Research Facility for K-12 and Teacher Education

**Presenter:** Dr. Michael Odell, University of Texas Tyler

**Co-Presenter(s):** Dr. Teresa Kennedy

**Abstract:**

The Education Research and Development laboratory consists of three charter laboratory schools and informal education venues. The Core Facility includes the Ingenuity Center, the Innovation Academy, and the Discovery Science Place, in collaboration with the College of Education and Psychology at the University of Texas at Tyler. The laboratory schools are utilized to study promising educational practices, field test of new curricula and learning technologies as well as educator preparation and professional development. In addition, access to informal education settings allow for the study of outside of school learning. Researchers from education, engineering, and psychology are currently using the facilities for research and development. The presentation will make the case that universities need to be more engaged broader K-12 education ecosystem and how Texas is unique in providing opportunities to develop K-12 research capacity.

Five lessons science education researchers and teachers can learn from John Dewey’s (1929) The Sources of a Science of Education

**Presenter:** Melissa Patterson, Texas Christian University

**Abstract:**

In this paper I expound on five themes, or lessons, found in John Dewey’s The Sources of a Science of Education, that science education researchers and practicing science teachers can use to inform their practice. John Dewey was an American philosopher, psychologist, and activist wrote The sources of a Science of Education in 1929 and his ideas about educational research are still relevant and insightful today. The first lesson is a reflection studying education with a scientific approach. Dewey begins the essay questing weather there is a science of education. Next, a caution against implementing research findings too soon. Followed by, an encouragement to embrace the variables we face in our research and practice because we can not isolate them like a scientist in a controlled lab. He also recommends education researchers consider qualitative methods in education research. Finally, Dewey calls education researchers and teachers to pull from other disciplines like biology, sociology, and psychology. Although Dewey wrote about education in the late 1800’s and the first half of the 1900’s his work still comments on contemporary issues in education, and should be read to enrich our practice in research and in the classroom.
Round Table Discussions

OK STEM Centers: A Regional Professional Development for Teachers
Presenter: Elizabeth Allan, University of Central Oklahoma

Abstract:
This program was build upon the OK STEM Center program to develop a statewide network of Science, Technology, Engineering, and Math (STEM) Master Teachers (MTs) capable of developing local collaborations and partnerships with stakeholders and provide the skills and knowledge necessary for successful grant writing.

Designed as a collaborative among the relevant stakeholders, the grant was be driven by an Advisory Board, composed of Oklahoma stakeholders. MTs were currently teaching in an Oklahoma school, selected for regional representation in both rural and urban schools, and committed to participating in extensive training with the goal of providing local, high quality training for teachers of STEM. In addition to providing for high quality STEM professional development, the MTs worked collaboratively and as a network with educators to develop lesson plans for a statewide STEM Teacher Website that supports the OAS standards. Regionally, the activities were held in collaboration with Career Tech Centers/regional universities where resident content experts were a resource for each MT.

Creating an Effective Network for STEM Teacher Recruitment
Presenter: Dionne Jackson, Hendrix College

Abstract:
Current research differs in outcomes regarding the recruitment of teachers, thus the need for further examination of methods for effective STEM teacher recruitment exists. This three year study highlights an undergraduate College in which science and mathematics degree programs have been a perennial strength, but historically the recruitment of science and mathematics majors to become STEM teachers has been challenging. The investigator has examined how to effectively develop and market an undergraduate teacher licensure program designed to recruit some of the numerous outstanding science and mathematics majors at the College to become highly-qualified STEM teachers, specifically STEM teachers in high-need school districts. Two major programmatic areas of the research were a scholar and intern program. Each program provided financial assistance to students: a partial to tuition free scholarship for scholars and a stipend for the interns. Activities used to market the program and recruit students included interest meetings, field experiences in high-need settings, campus fairs, visiting science and mathematics department meetings, and mass marketing efforts, such as mailings and flyers. The STEM teacher rate of recruitment for the three years of the study was 33%, as compared to 13% three years prior to the study and 5% 10 years prior. Additionally, 3 of 9 interns (33%) have indicated an interest in teacher licensure. The findings of this study add to the literature regarding marketing and programmatic elements that fostered the growth of an undergraduate STEM teacher licensure program.

What Knowledge and Skills Do STEM Teachers Need to Be Effective?
Presenter: Jane Metty, Mercer University

Abstract:
This presentation reports the findings of a study conducted to identify what essential knowledge and skill teachers who teach STEM disciplines from an interdisciplinary perspective in a STEM designated school need to be effective and successful. Extensive interviews were conducted with each of Georgia’ STEM designated school administrates and teachers as well as with supporting business & industry partners, published works and Georgia’s Department of Education STEM Program Manager.
Global Collaboration in Science Education
Presenter: Jill Nugent, Texas Tech University

Co-Presenter(s): Linda Cook Texas Tech University & Coppell ISD
               Meredith Bell Texas Tech University and Frisco ISD

Abstract:
In this session we will discuss global collaboration in science education, and we will share a continuum of global science collaboration that begins with global awareness and culminates in global contribution. Connections to the inclusion of global science in teacher education will be discussed. In the session example projects at each level on the continuum will be presented as will teacher success stories in global science collaboration. The session will include discussion and idea sharing among all participants.

Using Wordles as the Visual Data to Explore Prospective Elementary Teachers' Perceptions of Informal Science Education
Presenter: Sumreen Asim, University of North Texas

Abstract:
The purpose of this exploratory study was to investigate elementary preservice teachers’ perceptions of teaching beyond the classroom and identify how these notions revealed their strategies for helping their future students’ science learning. The qualitative study utilized Wordles, as visual data, to investigate the nature of elementary preservice teachers’ perceptions in an education program in a university located in the south-west of the United States of America. Preliminary findings indicate that all the participants recognized their potential as effective science educators in a variety of settings beyond the classroom walls.

Coaching as a Professional Development Model: At What Cost?
Presenter: Erin Pearce, Texas Christian University

Co-Presenter(s): Beau Hartweg Texas Christian University
                 Yohanis de la Fuente, TCU

Abstract:
Van Driel, Beijaard & Verloop (2001) posited that long-term professional development (PD) utilizing a peer coaching model was needed if science teachers were to be able to enact reform-based teaching practices. Four graduate students acted as ‘near peer’ coaches to high school biology teachers during a year-long PD project. The near peer coaches worked weekly with teachers in a plan-teach-debrief format to help foster reform-based teaching. This presentation describes what the coaches learned and provides insight into using a coaching model with in-service teachers.
Using the NSTA Learning Center as an E-Text, Portfolio, and Induction Tool

Presenter: Michael Odell, University of Texas at Tyler

Abstract:

The NSTA Learning Center is an online tool that can help in the development of preservice and inservice science teachers. This session will provide an overview of the NSTA Learning Center and demonstrate how the system can be used to support preservice and inservice teachers. Teachers and teacher candidates can sign up for the NSTA Learning Center at no cost and access content, lessons, web seminars, resources, and discussions. They can also develop a PD plan and portfolio that can be used throughout their science teaching career.
### Presenter Contact Information

<table>
<thead>
<tr>
<th>First Name</th>
<th>Last Name</th>
<th>Institutional Affiliation</th>
<th>E-mail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr.</td>
<td>Elizabeth</td>
<td>University of Central Oklahoma</td>
<td><a href="mailto:eallan@uco.edu">eallan@uco.edu</a></td>
</tr>
<tr>
<td>Mrs</td>
<td>Sumreen</td>
<td>University of North Texas</td>
<td><a href="mailto:sumreenasim@gmail.com">sumreenasim@gmail.com</a></td>
</tr>
<tr>
<td>Miss</td>
<td>Danielle</td>
<td>Texas Christian University</td>
<td><a href="mailto:daniella.biffi@gmail.com">daniella.biffi@gmail.com</a></td>
</tr>
<tr>
<td>Dr.</td>
<td>Vanessa</td>
<td>Loyola University Maryland</td>
<td><a href="mailto:vddodoseriki@loyola.edu">vddodoseriki@loyola.edu</a></td>
</tr>
<tr>
<td>Dr.</td>
<td>Andrea</td>
<td>Sam Houston State University</td>
<td><a href="mailto:asf004@shsu.edu">asf004@shsu.edu</a></td>
</tr>
<tr>
<td>Ms.</td>
<td>Christina</td>
<td>Texas State University</td>
<td><a href="mailto:christina.chapma2@gmail.com">christina.chapma2@gmail.com</a></td>
</tr>
<tr>
<td>Ms.</td>
<td>Lisa</td>
<td>Texas State University</td>
<td><a href="mailto:lisahanson2010@gmail.com">lisahanson2010@gmail.com</a></td>
</tr>
<tr>
<td>Dr.</td>
<td>Dionne</td>
<td>Hendrix College</td>
<td><a href="mailto:jackson@hendrix.edu">jackson@hendrix.edu</a></td>
</tr>
<tr>
<td>Dr.</td>
<td>Madelon</td>
<td>Baylor University</td>
<td><a href="mailto:madelon_mccall@baylor.edu">madelon_mccall@baylor.edu</a></td>
</tr>
<tr>
<td>Dr.</td>
<td>Jane</td>
<td>Mercer University</td>
<td><a href="mailto:metty_jm@mercer.edu">metty_jm@mercer.edu</a></td>
</tr>
<tr>
<td>Jill</td>
<td>Nugent</td>
<td>Texas Tech University</td>
<td><a href="mailto:jill.nugent@ttu.edu">jill.nugent@ttu.edu</a></td>
</tr>
<tr>
<td>Dr.</td>
<td>Michael</td>
<td>University of Texas Tyler</td>
<td><a href="mailto:modell@uttyler.edu">modell@uttyler.edu</a></td>
</tr>
<tr>
<td>Melissa</td>
<td>Patterson</td>
<td>Texas Christian University</td>
<td><a href="mailto:m.patterson8@tcu.edu">m.patterson8@tcu.edu</a></td>
</tr>
<tr>
<td>Erin</td>
<td>Pearce</td>
<td>Texas Christian University</td>
<td><a href="mailto:Erin.Pearce@tcu.edu">Erin.Pearce@tcu.edu</a></td>
</tr>
<tr>
<td>Dr.</td>
<td>Pamela</td>
<td>University of North Texas</td>
<td><a href="mailto:pamela.ponners@gmail.com">pamela.ponners@gmail.com</a></td>
</tr>
<tr>
<td>Dr.</td>
<td>Matt</td>
<td>Emporia State University</td>
<td><a href="mailto:cseimear@emporia.edu">cseimear@emporia.edu</a></td>
</tr>
<tr>
<td>Dr.</td>
<td>Becky</td>
<td>Texas A&amp;M - Commerce</td>
<td><a href="mailto:becky.sinclair@tamuc.edu">becky.sinclair@tamuc.edu</a></td>
</tr>
<tr>
<td>Dr.</td>
<td>Walter</td>
<td>Texas Tech University</td>
<td><a href="mailto:walter.smith@ttu.edu">walter.smith@ttu.edu</a></td>
</tr>
<tr>
<td>Dr.</td>
<td>LeeAnn</td>
<td>University of Texas Arlington</td>
<td><a href="mailto:leecannsb@uta.edu">leecannsb@uta.edu</a></td>
</tr>
<tr>
<td>Ms.</td>
<td>Terry</td>
<td>Texas Tech University</td>
<td><a href="mailto:terry.sutton@ttu.edu">terry.sutton@ttu.edu</a></td>
</tr>
<tr>
<td>Dr.</td>
<td>Sandra</td>
<td>Texas Woman's University</td>
<td><a href="mailto:swestmoreland@twu.edu">swestmoreland@twu.edu</a></td>
</tr>
</tbody>
</table>
Note: Due to construction, this is the ONLY route to the Rafes Urban Astronomy Center. This change may not be reflected in all GPS devices.

The Rafes Urban Astronomy Center is located at 2350 Tom Cole Road, in Denton, TX. From I35W exit FM 2449 and turn northwest and continue 2.9 miles. Turn right on to C.Wolfe Rd and travel 1.6 miles. Turn right on to Tom Cole Rd and continue 1.2 miles. The Rafes Urban Astronomy Center will be on the left.
Index

Allan, 4, 13, 16
Asim, 4, 11, 14, 16
Bifi, 11, 16
Carpenter, 9
Case Studies, 10
Coaching, 4, 14
Construction, 7
Culturally Relevant, 10
Curriculum, 11
Dewey, 12
Dodo Seriki, 10, 16
Elementary, 4, 7, 11, 14
Engineering, 13
Foster, 4, 16
Goodchild, 8, 16
Hanson, 10, 16
Informal, 4, 14
Inquiry-based Science, 10
Jackson, 4, 7, 13, 16
Learning Community, 8
McCall, 7, 16
Metty, 4, 7, 13, 16
Models, 11
Neismith, 7

NSTA Learning Center, 4, 15
Nugent, 4, 14, 16
Odell, 4, 12, 15, 16
Online, 9
Organizational Change, 9
Patterson, 12, 16
Pearce, 4, 14, 16
Ponners, 11, 16
Pre-service, 7, 8
Pre-service Science Teachers, 7
Professional Development, 4, 12, 13
Recruiting, 7
Recruitment, 4, 13
Research, 7, 9, 12
Resident Scientists, 10
Science Education, 4, 14
Seimears, 8, 16
Sinclair, 12, 16
Smith, 9, 16
Snell-Burke, 11, 16
STEM, 4, 7, 8, 9, 11, 13
Sutton, 9, 16
Westmoreland, 10, 16