2019 MIDWEST ANNUAL ROBERT NOYCE CONFERENCE

"Developing Strategies for Bringing Experiential Math and Science Teaching to High Needs Schools."

Marriott St Louis Airport
St Louis, Mo

Strand Abstracts

10:15 AM Strand 1 and 3 Workshops - in small breakout rooms (See Schedule Below)

Strand 1 ""Curriculum Enhancement and Skill Building Workshop" - Morning Session				
Time	**Title of the Presentation**	**Presenter(s)**	**Affiliation**	**Room Name**
10:15 – 11:15	**Implementing Formative Assessments to Support a Growth Mindset in Students**	Carlos Perez, Casey Crittenden, DawnMarie Hinson, Leander Taylor and Lorenza Ramirez	University of Houston	Salon H Moderator **J. Mutegi**
	Words associated with assessments have turned into daunting words for students. However, formative assessments can create and support a learning culture in the classroom, a culture in which students learn from mistakes. Participants will engage in a 5E lessons to explore: how students can learn through mistakes, the effectiveness of a formative assessments, misconceptions about formative assessments, and some formative assessment ideas. Through this presentation, participants will be able to understand the impact of formative assessments in instructional design and students' growth mindset.			
10:15 – 11:15	**A Concrete Decision: Using Concrete to Understand Properties of Matter**	Lillian Sims	University of Cincinnati	Salons F&G Moderator **C. Morton**
	Participants will learn how they can incorporate the engineering design process into a physical science unit about properties of matter. Working in stations, participants will have an opportunity to develop concrete mixtures, test concrete samples, and use data to help them redesign concrete mixtures. The presenter will share how teachers can			

	use activities from this workshop as a part of a challenge-based unit to help students address a real work problem: optimizing concrete properties.			
10:15 – 11:15	**Mathematical Surprises and Challenges**	Timothy Pennings	Davenport University	Salons II&III Moderator **M. Medina**
	George Polya said that the essence of mathematics is solving problems. In this highly interactive session, participants see a wide collection of mathematical puzzles and challenges which use elementary mathematics, but give rise to surprising results. A full list including solutions will be provided. These can be included in lectures or used "before the bell rings" to get students engaged in mathematical fun and games. Although fun and fast, there are deep lessons to be learned about the power and mystery of mathematics and the limitations of our intuition.			
11:15 – 12:00	**Elementary STEM Learning with Robotics Tools**	Amanda Thomas, Amy Sokoll, Jennifer Bauer, Leigh Anne Blankenship, Jennefer Hilgenkamp and Jessica Walston	University of Nebraska–Lincoln, Niobrara Public Schools, Niobrara, Falls City South Elementary School, Johnson Crossing Academic Center, St. Michael's Elementary, Hastings, NE	Salons II&III Moderator **M. Medina**
	This workshop will focus on the use of robotics to support elementary STEM teaching and learning. Fourteen elementary STEM Master Teaching Fellows from high-needs rural schools engaged in three-week of coursework that included computer science, engineering, and pedagogy for teaching elementary STEM with technology. MTFs engaged with multiple coding robots, analyzed pedagogical affordances and limitations, and aligned robotics learning opportunities with STEM content standards. Drawing from this experience, the workshop will highlight the use of robotics for teaching STEM content in elementary grades. Decades of research involving students' use of computer programming have shown coding to be a productive approach for developing mathematical understanding (e.g., Papert, 1980; Clements & Gullo, 1984; Clements & Sarama, 1997). Recently, a resurgence of coding in K-12 has been fueled by initiatives such as Hour of Code and code.org. Increased interest in coding and STEM, research documenting the positive impact of programming on math learning, and increasingly affordable computing and robotics devices offer new opportunities for teachers to engage children in STEM learning. The workshop will begin with a project overview and introduction to coding robots. Participants will then engage in hands-on exploration with a variety of robotics tools (e.g., Sphero, Ozobot, BeeBot, Cubelets) to identify STEM content learning opportunities. Participants will discuss learning activities to leverage robotics in their own contexts (with students of varying ages, coursework for pre-service or inservice teachers), followed by time for questions.			
11:15 – 12:00	**Accessing and Utilizing Students' Funds of Knowledge**	Alissandre Robbins, Susan Holzknecht, Erin Wise, Jasmine Haas and Krystle Dunn	Spring Branch Independent School District	Salons F&G Moderator **C. Morton**
	This session will provide an introduction to employ the funds of knowledge that students possess and the importance of connecting their prior knowledge to learning standards. Participants will be provided with multiple sample lessons that utilize funds of knowledge, and will have brainstorming time to create a lesson that incorporates their own students' unique funds of knowledge. Finally, participants will learn how to utilize funds of knowledge for asset-based connections to project-based STEM instruction. All participants will walk away with a funds of knowledge survey that can be used with students immediately, as well as multiple full lessons, and lesson ideas that all utilize students' funds of knowledge.			
11:15 – 12:00	**A Workshop to Support Middle School Students' Ability to Construct Scientific Explanations**	Ashley Poole, Laura Ruelas, Dawn Kahler, Stephanie Tubman, Jacqueline Huntoon and Amanda Gonczi	Michigan Technological University and Kalamazoo Public Schools	Salon H Moderator **J. Mutegi**
	Accessing, engaging in, and using research outcomes is one of the expectations of a teacher leader in Michigan. As part of a course to support the development of teacher leadership skills, three teacher participants (one 6th, one 7th, and one 8th) engaged in collaborative action-based research to inform their science instruction around the science			

	and engineering practice Constructing Explanations. All three grade levels of students received explicit instruction on the Claim-Evidence-Framework (CER) using non-scientific and scientific examples. Expectations were scaffolded by grade; 6th and 7th students focused on only claims and evidence while 8th grade students worked on articulating all three components of a scientific explanation. Students' ability to make claims, evidence and reasoning was measured using a pre/post unit assessment. Prior to the intervention, 10% of sixth grade students wrote an appropriate claim and 0% provided appropriate evidence. On the post test 50% made accurate claims and 53% provided evidence. The percent of 7th grade students who correctly made claims increased from 43% to 86% and those who provided evidence increased from 6% to 53%. Finally. 8th-grade students increased proficiency in all three areas of claim, evidence, and reasoning from pre- to post-assessment. These outcomes demonstrate that explicit instruction supports students' ability to make claims, provide evidence and reasoning but that ongoing practice throughout the academic year is needed. The teacher participants who implemented this action research found that engaging in classroom inquiry not only supported improved teaching, but also facilitates collaboration across schools and ongoing leadership opportunities.			
Strand 3 "Project Management, Research, and Teacher Education" - Morning Session				
Time	**Title of the Presentation**	**Presenter(s)**	**Affiliation**	**Room Name**
10:15 – 10:45	**Noyce Capacity Building Project: Strengthening STEM Teacher Education Pathways in Kentucky with Collaborative Partnerships**	Kristin Cook and Akhtar Mahmood	Bellarmine University	Salon A Moderator **K. Nguyen**
	Kentucky is facing a critical shortage of qualified STEM teachers in a number of high-need STEM disciplines and is unable to fill the vacant high school teaching positions with teachers who are certified to teach in their respective STEM fields especially in high-need schools. As part of the Noyce Capacity Building grant, we are strengthening the STEM teacher education pathways in Kentucky by forming collaborative partnerships and developing a recruitment/transfer pipeline and support system with community colleges under the state's Kentucky Community and Technical College System (KCTCS), Jefferson County Public School (JCPS) district, and their STEM and Education Academies, and the Kentucky Science Center to increase the number of qualified STEM teachers in high-need K-12 STEM classrooms in Kentucky. This project comes at a critical time for Kentucky because of the changing student demographic and the state's adoption of the Next Generation Science Standards (NGSS) that will have strong curriculum in STEM, and the development of new statewide performance assessments which will improve the educational achievements for all students. We are in the process of implementing an early-start Master of Arts in Teaching (MAT) program in the STEM fields so that STEM undergraduate students can complete the MAT degree with only one additional year of study beyond their undergraduate degree to get teaching certification in their respective STEM fields. Our efforts can potentially impact the minority students from the inner-city neighborhoods. We will present the status of our project that may be helpful to others.			
10:15 – 11:15	**Lessons Learned: Year 1 Implementation of Culturally Responsive Pedagogy in a STEM Education Preparation Program**	Leah McAlister-Shields, Paige Evans, Michelle Puig, Alondra Urenda, Kourtney Peterson, Amy Guerra and Sarah Vanderpool	University of Houston	Salon B Moderator **F. Yarberry**
	Culturally responsive pedagogy (CRP) is a major concept in urban and multicultural education that stresses the ability of teachers to respond to their students by utilizing their "students' cultures as a vehicle [or] bridge for learning" (Ladson-Billings, 1995, pg. 3). Moreover, research confirms that CRP is an instruction, which increases student success in high needs classrooms and broadens participation in STEM. As a result, teachHOUSTON has infused elements of CRP into their upper level courses. This session highlights activities utilized in courses including the employment of the Culturally Responsive Mathematics/Science Teaching Lesson Analysis Tool. This self-reflective tool promotes discussion and critical awareness through combining content, students' reflection on their instruction, and an equity focus.			
10:45 – 11:15	**Leadership Tasks: Opportunities and Barriers to developing Teacher Leaders Through Online Instruction**	Amanda L. Gonczi	Michigan Technological University	Salon A Moderator **K. Nguyen**
	This case study looks at the change in beliefs of a teacher throughout her participation in a leadership course that included action-based research as a course			

	assignment. The teacher participant elected to collect data on student interest in the Mi-STAR curriculum. She initially believed that problem-based learning would be too challenging for her students and its open ended-nature would be unappealing to her student population which is typically low achieving with only a minimal amount reading at grade level. Data collection and analysis challenged these beliefs. A majority of her students indicated being more motivated to learn science through Mi-STAR compared with previous modes of instruction. Students indicated they enjoyed several aspects of the curriculum including processes, modeling, experiments and stations.			
11:15 – 12:00	**Partnerships and Challenges: Noyce Track I at a mid-size institution**	Dorene Huvaere	Lewis University Romeoville	Salons A Moderator **K. Nguyen**
	Information will be shared regarding strengths and challenges of a Noyce Track I grant at a mid-size university. Examples of partnerships formed including community colleges, school districts and STEM related organizations will be discussed along with challenges associated with partners and scholar selection. This session will share lessons learned and ideas for creating a community of learners while building research opportunities in STEM education and ways to foster relationships with community partners. Participants will be encouraged to share their experiences and lessons learned while implementing and executing a Noyce grant.			
11:15 – 12:00	**Conversation on Lessons Learned**	Faith Yarberry and Terry Johnson	University of Central Arkansas	Salon B Moderator **F. Yarberry**
	Henry Ford said, "Failure is simply the opportunity to begin again, this time more intelligently." The University of Central Arkansas successfully completed the programmatic goal of increasing the number of qualified STEM majors teaching in K-12. However, we did identify aspects of the program that need to be improved. Key ingredients to successful programs have been recognized by conference attendance and listening to those that have demonstrated a greater success than ours. This session, therefore, will be less of a presentation and more of a conversation. During this session, we will verbalize the lessons learned at UCA and steps planned to improve future success, but the goal will be to have other project management teams share their success and failures so that we may learn from each other.			

12:00 PM Lunch Buffet

1:15 PM Strand 1 and 3 Resume Afternoon Sessions

Strand 1 ""Curriculum Enhancement and Skill Building Workshop" - Afternoon Session				
Time	**Title of the Presentation**	**Presenter(s)**	**Affiliation**	**Room Name**
1:15 – 2:15	**PrBL: Problem - Based Learning In Math: A Different Mindset**	Kim Hummons	The University of Cincinnati	Salons F&G Moderator **C. Morton**
	Employers complain that students leaving high school, and even college graduates, d not have the abilities to think critically and solve problems. They also do not demonstrate the skills to face adversity and fight through it. Just as employers are demanding different skills from their workforce, schools have had to adjust their approach to teaching. Especially in math, students need different sets of skills and educators should arm students with those defenses so they can be successful after whatever post-secondary path they choose. Problem-based learning is a changing and growing mindset of how mathematics is being taught. The appeal of PrBL is that it is designed to engage the student and teach critical thinking skills. It is a student-centered way to run a classroom which is often very scary for a teacher. These classes are usually loud and kids are walking around; they are not confined to rows and desks. They are visiting other groups for help or advice and talking to each other to strategize their next step. If done correctly, the student holds themselves to high expectations and assigns grades honestly. Students are taught not only to work in			

	groups but HOW to work in groups and maneuver through the material they need to answer their driving question. All skills that employers are saying they look for in new recruits. This session is for teachers that are ready to begin exploring a new way of teaching that encourages students to wake up their potential and use far more of their brain than they ever thought possible.			
1:15 – 2:15	**Adding the Classical Demonstration to your Curriculum to Meet NGSS Practices**	Larry Browning and Matthew Miller	South Dakota State University	Salon C Moderator **J. Mutegi**
	The adoption of NGSS has challenged teachers to take new approaches for teaching high school science. One of the three dimensions of the standards, known as the "science and engineering practices," expects teachers to help students develop skills which mirror scientific reasoning and engineering skills. We will focus on several of these practices including constructing explanations and designing solutions and engaging in argument from evidence while using demonstration-type activities in the classroom. During activities, we have designed a series of questions to allow observers to engage in the practices. First, a science activity is described, a question is asked about what will happen, students are polled using Plicker technology, then the activity is performed allowing students to re-assess their answers. At this point, we ask students more questions posing extensions to the activity. Students are allowed time to engage in argument and evaluate explanations, then are polled again. Therefore, students first practice creating explanations, then they practice engaging in an argument from evidence to suggest designing a new solution. During our workshop we will demonstrate several of these activities allowing participants to experience the method as a student then discuss how these activities could impact student's personal knowledge and reasoning. Additionally, we will discuss how teacher might implement this approach.			
2:15 – 2:45	**Attitudes toward Female Participation in Science & Technology**	Anu A. Gokhale	Illinois State University	Salon C Moderator **J. Mutegi**
	Gender-role attitudes of society are widely thought to deter teenage women from selecting science and technology (S & T) courses and subsequent majors and career paths. Gender-role attitudes are influenced by particular experiences and role changes during the transition to adulthood, including the influence of education. Funded by NSF, the project targeted female and male students. At the nexus of three overlapping spheres — the family context, the peer context, and the curricular and co-curricular structures — students make educational choices that affect their careers for decades. This study focused on curricular structure. Within this context, a four-week 'topical excursion' (learning module) is integrated into an existing course, typically taken by seniors in high school. The Science/Technology/Society (STS) approach — current issues in which the science, mathematics, engineering and technology play major roles — is combined with a gender-related subtext — choosing female scientists as authors, showing female scientists, engineers, and technologists at work, or raising the issue of gender bias in science research. A pretest-posttest control group design revealed that this strategy results in a positive change in attitudes of students measured using an established Attitudes toward S & T Scale. The goal is to increase social acceptance of S & T females through enhanced gender-sensitivity awareness. It is expected that constraining definitions of "femininity" will be challenged, and both females and males will continue to forge more expansive definitions of that term. The model exemplified in this project has the potential for replication.			
2:15 – 2:45	**Enhancing and developing a deeper understanding of curriculum through the use of models**	Jessica Hesler	University of Arkansas	Salons F&G Moderator **C. Morton**
	Biology and science, in general, is often difficult for many students to understand and be successful in. This becomes even more difficult when educators only teach with a couple of different multiple intelligences. According to Howard Gardner, there are nine different learning styles, these "multiple intelligences" consist of naturalistic, musical, logical, existential, interpersonal, kinesthetic, verbal, intrapersonal, and visual. Multiple intelligence tests conducted in the science classroom suggests that verbal and visual intelligence were far less predominant, but due to budget restrictions, these are the intelligence that are most commonly catered too. By incorporating models, activities, and inquiry-based experiments educators will be tapping into several of the multiple intelligences to ensure that students will develop a deeper understanding of the science content.			

2:45 – 3:15	**Teaching in Rural Schools for Noyce Scholars - A Panel Discussion**	Janet K. Stramel, Julie Weber, Elle Stein, Alysia Bixenman and Elaina Garrett	Fort Hays State University	Salon C Moderator **J. Mutegi**
	Come meet and discuss issues that are pertinent to rural schools' experiences. Questions you might ask and hear answered include: "What are your experiences teaching in a small town? Do you live in the town where you teach? What strategies do you have for having 5 or 6 preps? What opportunities have you experienced that really show the advantages (and disadvantages) of teaching in a rural area?			
2:45 – 3:15	**The Cold War Escape Room (and other Student to Student Math Circles)**	Janice Rech, Dario Gudino, Greg Lawson, Rachel Pugh, Hannah Seidl, Whitney Matthews and Michael Matthews	University of Nebraska at Omaha	Salons F&G Moderator **C. Morton**
	At the University of Nebraska at Omaha the Noyce Scholars have created a student-run set of Math Circles for local middle school students that we hold several times a year. The events have been very popular and tend to fill up quickly. The most successful math circles of late have taken the form of Escape Rooms - especially themed Escape Rooms. In Spring 2019, the Noyce Scholars hosted a Cold War themed Escape Room. The Scholars were able to successfully integrate a bit of history into their room while creating fun math-related puzzles for the middle -school-aged students to explore. For example, one of the unique puzzles that the scholars created was a plotting activity with the floor as a coordinate plane. **Attendees be warned. You will also have to attempt to escape from our Cold War Room.** We will conclude with a small discussion about best practices that we have learned about how to run effective Math Circles and Themed Escape Rooms in which students engage in fun and meaningful mathematics.			
2:45 – 3:15	**Math is Easy, Math is Fun- A Flipped Classroom Experience**	Kristen Weddington	Indiana University	Salons H Moderator **M. Medina**
	Geometry is a subject that many students either struggle with or get well. As I was teaching in the Fall of 2018, I was tired of the lecture, homework, rinse repeat. I wanted to give my students a way to learn and grow and also help my classroom engagement. I decided to start flipping my classroom. My students would go home, watch a lecture, post a summary of what they learned, and then return to school and show me what they learned. My method of teaching a flipped classroom, and a couple other classroom management strategies have turned my classroom upside down. My classroom is full of life, cultural expression, a sense of community and learning. My students trust me to teach them, and not to lead them down a path of failure. I have handed learning over to my students and helped them become more successful. I have student testimonials, surveys and data that shows this method works and change the way students learn.			
Strand 3 "Project Management, Research, and Teacher Education" - Afternoon Session				
Time	**Title of the Presentation**	**Presenter(s)**	**Affiliation**	**Room Name**
1:15 – 2:15	**Informed Practice: What a qualitative analysis of interviews with HBCU education deans tell us about the challenges and opportunities for HBCUs with NSF Noyce programs**	Ivory A. Toldson and Nyla Wofford	QEM Network	Salon B Moderator **T. France**
	The purpose of this research is to help Historically Black Colleges and Universities (HBCUs) with NSF Noyce projects and proposals understand what drives successful STEM teacher preparation at HBCUs. Further, the session will present ways to use HBCUs as a resource to resolve longstanding racial disparities and inequities in majority-minority school districts. Currently there are twelve active Noyce Awards at HBCUs. Four HBCUs with teacher preparation programs were compared: University of Arkansas Pine Bluff; Claflin University; Alcorn State University; and Southern University Baton Rouge. Institutional characteristics were explored, and education deans were interviewed. Qualitative data analysis revealed five primary themes and three secondary themes. Themes address institutional strengths and needs, as well as the needs of the surrounding districts and communities, against			

	the backdrop of state mandates and professional standards. These findings inform strategic priorities for HBCUs and Teacher Prep. Recommendations are provided that lead to policies and practices to increase STEM teacher diversity, mitigate STEM teacher shortages, and shift the narrative about one of, if not the most, consequential professions in this country.			
1:15 – 2:15	**Evaluating Noyce grants using Culturally-Responsive Research Framework**	Kavita Mittapalli	Appalachian State University (NC) and Be Brave, Teach STEM -- Alcorn State University (MS)	Salon A Moderator **K. Nguyen**
	A majority of NSF-funded projects require separate research and evaluation components that are uniquely different from each other while also being joined/aligned in some ways. Research and evaluation serve different purposes (knowledge generation vs program improvement) but come together to share methods and analysis. They diverge again in their findings and outcomes. As evaluators of two current Noyce projects,14 other NSF grants, and education researchers on several other federally-funded grants across the US, MNA is working towards incorporating a more participatory, inclusive, and culturally-responsive research and evaluation framework as posited by scholars Frierson, Hood, Hughes, and Thomas (2010) and Hood, Hopson, & Kirkhart (2015). CRRE is a holistic framework for centering research/evaluation in a culture that recognizes that culturally defined values and beliefs lie at the heart of any work. CRRE facilitates deeper conversations, engagement, learning, and real-time continuous development and feedback for data collection, analyses, and reporting that allows open dialogue and improvement. CRRE gives attention to groups that have been historically marginalized and underserved, seeking to bring balance and equity into the research and evaluation processes (Hopson, 2009). The 60-min session will engage the audience in two ways. First, a slide presentation will provide a context and an overview of the differences between research and evaluation, followed by definition and usage of CRRE principles in Noyce projects for conducting evaluation work. Secondly, the audience will be engaged in 2-3 discussion questions related to their projects and how they are working with their researchers/evaluators to conduct a more inclusive CRRE work. Finally, a share out of lessons learned, any emerging good practices using CREE, and a general Q and A will be completed to wrap-up the session.			
2:15 – 2:45	**Webster Educating STEM Teachers Bound for Success (WESTbound Success) Project: Curriculum Revision and Student Success on Missouri STEM Certification Exam Using Expert STEM Faculty as Evaluators**	Anton Wallner, Teresa Alvarez, DJ Kaiser, Ravin Kodikara, Jennifer Bond, Marissa Cope Boysen	Webster University	Salon A Moderator **K. Nguyen**
	As part of our Noyce Capacity Building grant, we examined how existing STEM course content is preparing students for the Missouri Content Assessment (MoCA) exam that is required for state certification. We also examined this through the lens of the recent curriculum designed on the state of Missouri model, which is Unified Science: Biology. Our most recent graduates in STEM Education exhibited difficulty in passing the MoCA exam in their specific STEM area of interest. Data from 2014-2018 showed that only half of our teacher candidates passed their STEM field MoCA exam on the first attempt. Some candidates took as many as four attempts to pass their exams while others were unable to achieve a passing score. In order to increase the number of teacher candidates as well as their success rates on the MoCA exam, we planned targeted revisions to our curriculum and coursework at Webster. One approach we used was to have content experts (faculty from Webster and our partner institution, St. Louis Community College) take the MoCA exams in their respective STEM disciplines. The qualitative survey results, coded using NVivo, and feedback from these experts allowed us to map learning outcomes and knowledge areas found on the exam to information on the MoCA website as well as our existing curriculum and course content. In this presentation, we will report the results of our survey, the impact this had on our curriculum redesign and articulation agreements, and our future strategies for our Track 1 application that were informed by the results of our capacity building activity. We also include use of study guides, practice tests and review sessions for MoCA exams to impact/improve pass rates of STEM Education majors on the content exam.			

2:15 – 2:45	**The Two-Way Flow of Knowledge: the Scholar/Clinical Mentor Connection**	Katherine Stickney, Kimberly Baker and Deborah Sachs	University of Indianapolis	Salon B Moderator **T. France**
	The one-year, full-time University of Indianapolis Robert Noyce Teacher Scholarship Master of Arts in Teaching Program includes a clinical residency in an urban, high-need school. During the clinical residency, Scholars are embedded in the classroom of a cooperating mentoring teacher (CMT) and progress from co-teaching with the CMT to independently teaching one or more focus classes in their content area. A unique emphasis of our program evaluation is the impact of hosting the Scholar on the practice of the CMT. Early results of our investigation into this relationship show that a CMT's own teaching practice is informed by mentoring the Scholar and that CMTs have also made gains in their professional development and confidence as teacher-leaders. Other factors that will be discussed from the viewpoint of the CMT include the growth of the Scholar over the course of the clinical residency, the integration of the Scholar in all aspects of the school in terms of professional development and community involvement, and the manner in which sharing content ideas and pedagogical approaches has positively influenced both the Scholar and CMT.			
2:45– 3:15	**Innovative Pathways in STEM Teacher Preparation: Bridging the Gap between University Expectations & Secondary School Needs**	Ryan Zonnefeld	Dordt University	Salon A Moderator **K. Nguyen**
	Innovative teacher preparation programs for STEM education are essential for meeting the goal of ensuring that secondary school students receive instruction from a certified teacher. This session explores the role that interdisciplinary STEM and mathematics programs can have to increase the number of certified teachers prepared to teach STEM classes from an interdisciplinary approach.			
2:45– 3:15	**Connecting Math Standards + Engineering Activities**	Todd France	Ohio Northern University College of Engineering	Salon B Moderator **T. France**
	Over summer 2019, a team of faculty and student researchers analyzed a subset of activities on the popular virtual library TeachEngineering.org. The goal of the study was to investigate the alignment of Common Core State Standards for Math with activities designed for students in grades 7-9. Preliminary results from this study indicate strong connections between mathematics and engineering throughout the online resource, yet if activities are not framed appropriately, there can be unintentional disconnects between these two interdependent disciplines. Recommendations for helping teachers design activities with both engineering content and appropriately aligned math standards will be presented, as will an introduction to the TeachEngineering.org website.			
2:45– 3:15	**Girls STEM Institute: Impacting Black girls' self-efficacy and interest in STEM**	Crystal Morton and Jasmine Bride	Indiana University - Purdue University Indianapolis	Salon II Moderator **W. Hunter**
	In most K-12 schools, Black girls face limited access to STEM course offerings and rigorous STEM learning experiences. Black girls are often placed in mathematics classrooms dominated by non-engaging and non-rigorous curriculum devoid of meaning and any real connections to their lived experiences. With the growing interest in STEM and the persistence in racial disparities in educational achievement, educators must provide learning experiences that support the positive development of Black girls as STEM learners. In this session, we will explore the impact of a holistic informal STEM learning program that utilizes a socially transformative curriculum framework to better understand the relationship between informal STEM learning and Black girls' development as STEM learners.			

* Indicates Sub-Grant awardees from 2018.

10:15 AM Break

10:30 AM **Concurrent** (these sessions will be happening at the same time)

Time	Title of the Presentation	Presenter(s)	Affiliation	Room Name

10:30 -11:30	**Discussion about Sub-Grants Program**	Dr. Willy Hunter	Illinois State University	Salon H
	A Discussion of the Midwest Noyce Subgrant program: Its successes and challenges for attendees. Data will be shared on the proposals review and granting process. Advice will be sought on how to improve the program in the future and on how to generate more proposals and achieve program goals.			
10:30 -11:30	**Discussion with PI's**	Dr. Sandra Richardson	Program Director at the National Science Foundation (NSF) in the Division of Undergraduate Education in the Directorate of Education and Human Resources	Salons A&B Moderator **K. Nguyen**
10:30 -11:30	**Using STEM Projects to Teach Mathematics and Science**	Brad Christensen	Illinois State University	Salons F&G
	STEM projects are far too often used only as "fun projects" to promote team building and problem solving skills. At best they are used to apply what has already been covered in math and/or science. Research and experience shows that carefully designed and properly executed STEM projects are very effective at teaching academic content. This workshop will allow teachers to experience several of these projects and explore how they can be implemented into their existing programs.			
10:30 -11:30	**Culturally Critiquing the Curriculum**	Vanessa Gee and Jomo Mutegi	Indiana University Bloomington and Indiana University Purdue University Indianapolis / CTI Inspire	Salon C
	As a teacher in an urban school, I sat through a lot of professional development based on Culturally Responsive Teaching. While I found the strategies helpful in regards to relationships with my students, the training rarely addressed curriculum, even worse as a science teacher, the trainings never addressed science curriculum. Culturally Responsive Teaching has been thought to be one of the many solutions to the persistent education gap between students in the United States. Very few studies have been done in the area of culturally relevant science curriculum. As a teacher I was lucky to attend an in-service summer development program that helped me implement culturally relevant science lessons. Now as a researcher, I hope to help science teachers develop culturally responsive and socially transformative curriculum. This workshop explores the necessity, benefits, and implementation of a culturally responsive and socially transformative science curriculum. By using five areas of mastery (Mutegi,2011), teachers will be able to create science lessons and units centered for their diverse students needs. While this is centered on science curriculum, all teachers all welcome and all can benefit from learning how to implement culturally relevant curriculum. An outline for creating a culturally responsive and socially transformative lesson for African Americans students will be provided. This workshop will conclude with time for teachers to collaborate and develop their own transformative lesson plans.			
10:30 -11:30	**Strand 2 Follow-up: Create Your Own walkSTEM Experience**	Nicolle von der Heyde	University of Missouri–St. Louis	Grand Ballroom

11:30 AM Closing Plenary Session – *in Grand Ballroom*

- Dr. Jessica Krim, Southern Illinois University at Edwardsville

12:00 PM Adjourn