Friday, April 17

"I Get to Feel Like a College Student": The Differential Impacts of Two STEM Interventions ● *2:15-3:45, Marriott, 4th level, Addison* ● In paper session: *Effects on Student Learning in the Science Classroom* ● Research is unclear on how and why students benefit from informal STEM programs. In this study, we investigated differences in the self-efficacy, STEM interests, and perceptions of school between students in an intensive STEM program (STEM-I), students at in intervention school, and similar students who are not in a program, and what program features may contribute to any differences. Quantitative results reveal substantial benefits for participants in the STEM-I program for STEM interest and related outcomes. Qualitative analyses using the social cognitive career theory factors found that STEM-I experiences were closely connected to students' self-efficacy, as were experiences on the college campus. This study emphasizes the critical role of socially embedded learning experiences in STEM out-of-school programs. **Presenters**: Margaret R. Blanchard (North Carolina State University), John C. Bedward (Buena Vista University), and Steve McDonald (North Carolina State University)

What Matters? Instances of Science and Engineering Learning Among Students Living in Native American Communities in Idaho and Washington ● *4:05-5:35pm, Sheraton, Second Level, Superior A* ● In Symposium: *Learning as Transformation: Examining How Youth Author New Learning Pathways/Ecologies in Science, Engineering, and Technology* ● This study examines how middle school students (Native and Non-native) that live in two tribal communities in the Inland Northwestern United States express and connect their identities as scientists, engineers, and community members. The research questions that the study seeks to answer are as follows: How do students from two communities display their socio-cultural identity while conducting tasks related to science and engineering? What perceptions do grade 4-9 students from two tribal communities have about science and engineering? Using data from interviews, student artifacts, and video analysis we intend to spark a discussion about how to design and foster effective learning environments for Native American students. Special emphasis will be on current and traditional science and engineering practices and how students can best connect learning to their everyday lives. **Presenters:** Sameer Honwad (New York University); Anne Kern, Melinda Howard, Fritz Fielder, Laura Ann Lamautia (University of Idaho); Christine Meyer (Coeur d'Alene Tribe of Indians); Nora Numkena (Spokane Tribe)

Saturday, April 18

Putting the "I" in STEM: How Rural, High-Poverty Middle School Students Incorporate Who They Are in Their Consideration of STEM Careers ● *8:15-9:45, Hyatt, East Tower – Purple Level, Riverside West* ● In roundtable session: *Can I See Myself Here? Marginalized Identities and STEM Learning* ● This exploratory case study is part of a large scale NSF ITEST project, carried out in 4 rural, high poverty middle schools with a comparison district, 45 participating teachers, 40 leaders, and 2200 students to promote interest in and preparation for STEM careers. Within this project, a smaller intervention was carried out with 85 students in one science teacher's classrooms in one of the intervention districts. This study investigates in depth how four of these 8th grade students identify with different careers, weigh the relative costs and task values, and describe their abilities and social supports, applying the expectancy-value theory of achievement motivation for qualitative data analyses. Results highlight the critical importance of informed social supports for underrepresented students. **Presenters:** M.W. Kier & Margaret R. Blanchard (North Carolina State University)

Engaging Native American 3rd-8th Grade Students in STEM through Culturally Relevant Science ● *8:15-9:45am, Hyatt, East Tower - Purple Level, Riverside East* ● In roundtable session: *Are We Ready for This? Addressing Racial and Cultural Difference in STEM Learning* ● This roundtable discussion will focus on the development, delivery, and outcomes of a culturally relevant informal STEM program (iSTEM) intended to increase STEM engagement, interest, and knowledge among Native American 3rd – 8th grade students. Utilizing a Funds of Knowledge framework, the iSTEM project incorporated a hybrid model including (1) one on one mentoring and (2) informal science activities (flash STEM activities at lunch hour; field trips). The model, program activities, facilitators and barriers to implementation/delivery, along with project outcomes will be highlighted. **Presenters:** Corey Knox & Rachel Gomez (University of Arizona - Southwest Institute for Research on Women)

Fostering and Maintaining Students' STEM Interest Throughout the Educational Pipeline ● *10:35am-12:05pm, Sheraton, Second Level, Superior A* ● Symposium session ● In order to successfully pursue fields like engineering in post-secondary studies and as careers, students must sustain high levels of interest and academic preparation in STEM subjects. In this symposium, we will discuss and explore the outcomes from four programs designed to meet both objectives by providing innovative STEM experiences to students from a variety of backgrounds and age groups. Each ITEST funded project approached the dual goals of engagement and achievement differently, and discussion will focus on the ways in which the range of experiences presented can be generalized into strategies and recommendations for introducing engineering concepts to diverse student populations. **Session Organizer:** Alana Newell (Baylor College of Medicine) **Presenters:** Nancy Moreno (Baylor College of Medicine); Shelley Goldman (Stanford University); Nancy Taylor (San Diego State University); Alfred Hall (University of Memphis) **Chair:** Alana Newell (Baylor College of Medicine) **Discussant:** Joyce Malyn-Smith (Education Development Center, Inc.)

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Sunday, April 19

Place and Culture in Game Design: Enhancing Students' Computational Thinking, Spatial Visualization, and Problem-Solving Skills ● *10:35am-12:05pm, Hyatt, West Tower - Silver Level, Horner* ● In paper session: *Division C Section 1e: Computer Science and Engineering Education in Elementary and Middle School* ● Eleven teachers and 133 students attending eight schools in Wyoming (including two reservation schools) participated in the uGame-iCompute (UGIC) project funded by the National Science Foundation. Students created their own games using Scalable Game Design and the AgentSheetsTM tool. Student products were rich in terms of cultural artifacts and identity. As a result of the study, students' pre-post measures on self-efficacy revealed computer gaming remained strong and self-efficacy in using the computer for problem solving was marginally significant. **Presenters:** Jacqueline Leonard, Joy B. Johnson, & Olalekan Idowu (University of Wyoming); Doanna Hunter & Kristin Kelton (Worland Middle School)

Monday, April 20

Toward Social Justice Through Expansion of STEM Opportunities: The Influence of After-School and Summer Programs ● *8:15-9:45am, Sheraton, Second Level, Arkansas* ● Symposium session ● In this symposium, the results of five NSF ITEST program funded projects detail findings related to expanding opportunities for youth in STEM. Two papers examine learning opportunities among indigenous student populations, one paper examines the retention of STEM interests among urban students who participated in a summer camp, and two papers explore best practices for building STEM retention and interest in afterschool programs. The results of these studies are important for studying and promoting best practices to expand early opportunities for underrepresented minorities and women to engage in high-quality STEM programs. Such experiences encourage student interest in STEM, which is a predictor for majoring in STEM in college and eventually participating in a more diverse STEM workforce. **Session Organizer:** Jacqueline Leonard (University of Wyoming) **Presenters:** Alana Newell (Baylor College of Medicine); Jacqueline Leonard (University of Wyoming); Anne Kern, Melinda Howard, Laura Ann Lamautia (University of Idaho); Karen Yanowitz (Arkansas State University); Michael Evans (North Carolina State University) **Chair:** Bernadette Sibuma (Education Development Center, Inc.) **Discussant**: Tony Streit (Education Development Center, Inc.)

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