EWLSE Promotes STEM for Girls

"Teaching Girls Science & Engineering"

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EWLSE Leadership Activities at IW Support IWD 2019!

In the spirit of the United Nation's theme for International Women's Day: "*Think Equal, Build Smart, Innovate for Change,*" we prepared this INCOSE Empowering Women as Leaders in Systems Engineering (EWLSE) team's January 2019 INCOSE International Workshop (IW) report. Raising awareness to *"Think Equal" i*s one of EWLSE's initiatives to support the vision of a world where women and men are equally represented as leaders in systems engineering. INCOSE and the systems engineering community at large support the *"Build Smart"* approach as part of their vision to build a better world through a systems approach. And systems thinking, where critical thinking is applied from a foundation of systems theory, includes divergent, convergent, and innovative thinking integrated to support *"Innovate for Change."* Divergent thinking is where we consider all of the possibilities of how we can achieve a world where we collaborate as equals – a vision of all that we could accomplish. Convergent thinking focuses in on a chosen path to realize the shared vision of a world where each person is valued and there is no limit to potential and opportunity for contributing. Yet, to achieve a goal of parity it takes innovative thinking, developing and following through on new perspectives and new ideas, to move beyond the current approaches, the hurdles and obstacles that are holding us back, and leapfrog to a world where all collaborate on equal footing. We took some steps to move beyond at the IW. Nearly 30 people gathered to participate in the Empowering Women as Leaders in Systems Engineering (EWLSE) IW outreach session. The INCOSE IW is where professionals come together to work on interesting and big societal challenges using systems engineering.

For the INCOSE EWLSE outreach session, the audience was divided into three groups to perform activities in support of the **"SciGirls Seven: How to Engage Girls in STEM" resource**. The team used guidance from a prior workshop led by Rose Delaney, president of the Society of Women Engineers student chapter of the University of New Mexico (see "Educating Future Female Engineers," by Delaney Rose Heileman in the Q4 INCOSE 2018 newsletter). Everyone in attendance participated and worked on the following three activities, each group working simultaneously on one of the activities at a time in a round-robin approach.

Activity 1: Define a lab project for a student team that supports the SciGirls Seven strategies for engaging girls in STEM. Include the problem or opportunity for the students to address, objectives of the lab, anticipated steps, and the anticipated outcomes. The three groups developed ideas for projects that emphasized collaboration with fair participation and communication, personally relevant projects, hand-on/open-ended projects, and projects that they could apply their own creativity, talent, and learning styles to. These projects supported the SciGirls Seven, but did not limit the projects to something just girls would be participating in. Participants considered not just the projects themselves, but also what age ranges and time frames would be appropriate for the projects, and what type of resources the projects would require. They focused the projects on systems engineering principles and practices such as modeling, integration, and understanding stakeholder requirements. Groups were able to come up with multiple projects and concepts that could be used across many ages and backgrounds that would allow project participants to make a change to their environment.

Activity 2: Create a list of female role models. For each, you must include a bit about them, their characteristics, and what characteristics you have in common–tally them up! This activity supports the SciGirl strategy that girls benefit from relationships with role models and mentors. The three groups did an excellent job identifying female role models and then focused on not only what attributes they shared with them, but also the type of attributes that were important for the future. Some interesting role models identified were Mayim Bialik, Madame Curie,Katherine Johnson, Maria Montessori, parents, and self. Most identified with the attributes of the role models!

Activity 3: Think about someone who did something that made you feel empowered. Describe the situation to the group and then write a short letter to yourself about the event and how it made you feel. This activity supports the SciGirl strategy that girls gain confidence and improve performance with specific positive feedback on effort, strategies, behavior, and when encouraged to think critically.

The three groups talked about how others have in the past said or done something that made them feel empowered and then wrote a private letter to themselves about the experience and how it made them feel. Learn more about EWLSE at incose.org/ewlse!