IAF SPACE EDUCATION AND OUTREACH SYMPOSIUM (E1)
Space Education Outreach and Workforce Development for Emerging Communities (IPB)

Author: Dr. Howard Greene
The Ohio State University, United States

Dr. Samantha Trzinski
The Ohio State University, United States

STARLAB EXPERTLINK – A GLOBAL BEST-PRACTICE TO BRING SPACE EXPERTISE INTO CLASSROOMS VIA A DESIGN CHALLENGE RELATED TO COMMERCIAL SPACE-STATION RESEARCH AND DEVELOPMENT

Abstract

STEM outreach initiatives can be broadly categorized as those that build awareness and those that build skillsets. To eventually affect STEM career trajectories, awareness-building activities need to be followed by deeper skillset-building activities. Further, student engagement is strongest when outreach has elements that are both experiential (involve "hands-on"/applied learning) and authentic (involves the people who are impacted and experts from the field). A design challenge, wherein students work on teams to propose, design, build and test solutions to real-world problems with expert input or involvement, couples awareness-building and skillset-building activities while incorporating "experiential authenticity".

During 2023-24, in cooperation with the Voyager/Airbus joint venture building the Starlab space station and associated George Washington Carver Science Park (GWCSP), The Ohio State University and Ohio STEM Learning Network (OSLN) engaged youth on a statewide, space-related design challenge.

Over 112 schools from across the state of Ohio participated in the design challenge, enlisting approximately 30,000 students. The design challenge problem statement was:

"How do we improve the health and well-being of astronauts aboard Starlab orbiting the earth? Develop a plan, system, or product to positively impact the sustainability of the physical and/or mental health of those living in space for an extended period of time."

We took this design challenge activity a step further, by linking classrooms directly with space experts. The Starlab ExpertLink program connected panels of space experts from government, industry and academia directly into K-12 classrooms to support, guide and answer questions related to the design challenge. These experts brought authenticity and real-world problem-solving ability directly to students who were working on a challenge, through live interaction and problem solving related to their expertise.

A broad-based network of 38 space experts from 13 organizations across the US and Europe were recruited to serve on expert panels. Twenty-four schools requested and received panels that met live with classrooms several times over the course of the design challenge, which culminated in January 2024. To further support inquiry, an online QA forum "SpaceBytes" was developed to answer student questions that arose between panel sessions. Panelists submitted video or text answers to SpaceBytes, benefitting all schools.

This paper describes the key innovations found through the synergy of the Starlab design challenge and ExpertLink, summarizes best practices, shares results from student engagement, and offers lessons learned and articulates the next steps for the outreach program and how to adapt it to a global space audience.