RESEARCH STATION FOR TEAM PERFORMANCE

Mobile Extreme Environment Research Station (MEERS)

ABSTRACT

The composition of crew for long duration space mission is critical to safe and successful missions. Unfortunately, there is a limited amount of research relating to team composition. To study the Input-Process-Outcome model of team performance, a simulated space habitat known as the Mobile Extreme Environment Research Station (MEERS) will be used focus on two input variables: the biological sex of the crew (men vs. women) and the personalities of each crew member. These variables will be observed to determine how the mixture of men and women along with their different personalities can affect team communication, cohesion and performance.

Currently, MEERS is undergoing construction to prepare for a four person crew to perform a variety of tasks. While be renovated, an HF4 class is being used to work on different portions of the project (workstations, electrical, habitability, etc.). Also, ECSSE senior design team is creating the communication software that will be used for future simulated missions.

MEERS IS CURRENTLY UNDER CONSTRUCTION!

INTRODUCTION

Deep space exploration missions will bring challenges not just for technology but also with communication. For a mission to Mars, there is a communication delay between the crew and ground support on Earth for nearly 20 minutes. Crew would not be able to rely on real-time instructions thus the most critical element of exploration missions is the functioning and performance of the crew.

For our research, McGrath's Input-Process-Outcome model of team performance will be used to focus on the inputs, like team composition, affect processes such as communication and cohesion of the team. We will focus primarily on two input variables related to team composition, the biological sex of the team members (men vs. women) and their personality, and two process variables, communication and cohesion, and then measure performance on several outcome variables.

METHODS

- Comprehensive literature review on team performance specifically with a focus on spaceflight, space simulations on Earth, and space analogs. Results will support experimental hypotheses related to inputs that can affect processes like communication and cohesion.
- Develop mission scenarios for the Artemis simulation that will be ran inside MEERS and in the STAR lab in the Human Factors department on campus.
- Once experimental method are ready, four student will spend up to eight hours inside MEERS to complete various tasks for the simulation space mission. A team of researchers will run the mission from the STAR lab and collect data.

WORKING ON DESIGN

- Safety Compliance
- Operational Flexibility
- Productivity
- Efficient Information Display