IAF SPACE EDUCATION AND OUTREACH SYMPOSIUM (E1)
New Worlds - Non-Traditional Space Education and Outreach (7)

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INTERDISCIPLINARY SPACE LAB (PHASE 3 AUSTRALIA-USA PARTNERSHIP): UNDERGRADUATE CURRICULUM INNOVATION ADDRESSING ASTRONAUT HEALTH AND WELLBEING REQUIREMENTS FOR LONG DURATION SPACE MISSIONS (LDMS)

Abstract

This paper presents the third annual iterative outcomes of an innovative university-based space program creating design ideas for astronaut health support and wellbeing during a long duration mission (LDM) for a future inhabited lunar moon base or Mars Mission astronaut transit. University faculties including Built Environment, Industrial Design, Engineering, Science, Health, and Medicine are brought together to develop a new understanding of discipline capabilities with the prospect to co-creatively provide new opportunities and inspiration for team-work across fields. This is of key interest to employers of new graduates in space or innovation-based industries where human factors and designing for high quality human-centered outcomes supports career resilience through currency, agility, and focus.

The importance of an interdisciplinary approach through positive mindset, cross-field knowledge, and co-creative team actions is integral for continuing space exploration success as evidenced by past and ongoing terrestrial space habitat analog missions and extraordinary International Space Station (ISS) achievements.

The altruistic nature of interactions that make the ISS a success on multiple levels across cultural, scientific and humanitarian foundations provide the template for cross-disciplinary inspiration, that leverage synergies, and shared goals unattainable by single fields alone. It is not traditional for disciplines to work so closely together though industry has an expectation for this knowledge.

Previously teams of three (2018); five (2019), and now ten undergraduates in 2020 represent team formation. Student numbers across the design for space theme have grown from fifteen, to twenty-five, to forty students in 2020. Now opportunities to respond to the complexities of the project in more detail are presented in addressing the overarching research domains in spatial design, human factors and design for health for LDMs with a new diverse team mass not previously experienced. Team supervisory staff has grown from 1-to-3 and provides further skill sets for team guidance and discipline specialisation to inform three iterative project phases across the twelve activity weeks that focus on human spaceflight, exercise, related design performance and materials, and selected UNSDGs principles.

Periodic project collaborations with sports and health science, engineering, neuroscience, telehealth, health informatics, and industrial design academics (project host discipline and non-traditional space area) provide the environment for discussion, development, and co-creative processes that have led to new discoveries and stimulus for new collaboration, international understanding and advancing humankind.