

IAF SPACE EDUCATION AND OUTREACH SYMPOSIUM (E1)
On Track - Undergraduate Space Education (3)

Author: Dr. Sasha Alexander
Western Sydney University, Australia

Prof. Olga Bannova
University of Houston, United States

INTERDISCIPLINARY SPACE LAB: UNDERGRADUATE CURRICULUM INNOVATION UTILISING
ASTRONAUT HEALTH AND WELLBEING REQUIREMENTS FOR LONG DURATION SPACE
MISSIONS (LDMS)

Abstract

This paper presents innovative curriculum for undergraduate industrial design program “Interdisciplinary Space Lab” that focuses on discovery and experiential learning in planning for future complex work in dynamic practice environments through concept development, iterative prototyping processes, and collaborative multiple discipline viewpoints.

Universities seek to introduce undergraduate students to the importance of entering interdisciplinary practice environments despite there being limited information on how to proceed (Gestwicki P., and McNealy B., 2016). A long duration mission (LDM) project based learning ‘design for space’ Australian studio focusing on astronaut health and wellbeing has been developed for students who have completed 1.5 years of university study in any disciplinary area. This envisioned practice environment seeks to expand diffusion of space studies and importantly stimulate motivational strategies that are inclusive across discipline boundaries toward the merits of multi-modal ways of seeing, developing and collaborating through an iterative design process from concept to prototype embracing design thinking in diverse projects. The interdisciplinary space studio’s framework acknowledges discipline-based specialisations and the intersection potential of synergistic team approaches through heightened understanding of cross-disciplinary vocabularies. The action-learning lab captures positive general public sentiment toward space discoveries and educative insights of past space exploration and space education (SICSA 2018; Haeuplik-Meusburger S., Bannova O., 2016) with the view that experiencing novel and impactful nature of a wider variety of disciplinary skills and in complementing one’s own field can stimulate a continued interest in the promise of the future. Reaching out to disciplines beyond engineering professions including medicine, sports science, psychology, economics, neuroscience, ICT, management, health sciences, construction, education, industrial design, architecture, materials science, nursing, and cultural studies has resulted in challenges in preparing for collaborations and project assessment procedures against shared subject learning outcomes. New ‘cross-disciplinary equitable’, concise and transparent team charters and an innovative ‘patience-to-listen discipline respect framework’ has presented a signature undergraduate experience and provided an often discipline absent life-long learning case model fulfilling needs for enriched interdisciplinary experiential learning as an innovation accelerator and responsive practice roadmap across disciplines.

ISLab results support preparation for open professional mindsets, heightened confidence and keenness to adopt co-creative action-oriented practice for future work environments. Impacts include university-wide new-to-engagement space futures; student-led reflective activities discussing cross-disciplinary integrative approaches and responses; qualitative measures for prospective positive life impacts both project-based and personal; wider career outlook; and meaningful team goals targeted towards projects with new discovery frontiers of global or inter-global focus - space.