

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

Author: Mr. James Xie
International Space University (ISU), Canada, james.xie@community.isunet.edu

Ms. Alina Kunitskaya
University of British Columbia, Canada, akunitsk@ucalgary.ca

Ms. Allegra Pearce
University of Guelph, Canada, allegrapearce@gmail.com

PROJECT MANAGEMENT CASE STUDY OF STUDENT TEAMS IN A BALLOON PAYLOAD
DESIGN COMPETITION

Abstract

Projects in the space industry are multidisciplinary and complex, and the Canadian space sector is actively interested in training the next generation of scientists and engineers to have the skills necessary to approach them. Multi-university design competitions in Canada are a unique environment where students can pursue space-related projects to build practical skills and interact with professionals in the space sector. The responsibilities of students on these teams are typically larger than a classroom design project, including project planning, financing, recruitment, outreach, and logistics in addition to a more complex technical scope. Project management risks can prevent student teams from succeeding or sustaining past their first year which reduces learning outcomes, but there are limited comparable resources with which teams can assess their project management plans. This paper examined 11 student teams from across Canada that participated in the Canadian Stratospheric Balloon Experiment Design Challenge (CAN-SBX) from 2017 to 2021 to identify trends in behaviour, collect best practices, and benchmark their project management performance. CAN-SBX challenges students to design, manufacture, validate, and operate a payload to be flown on an expandable stratospheric balloon platform provided by the Canadian Space Agency. This program is unique in Canada and offers a low-cost bridge for students to perform technology demonstrations or conduct high-altitude research in a space-like environment. Students have one year to develop their concepts and are required to submit documentation and presentations for stage gate reviews. Submitted documentation and correspondences were used to create benchmarks for risk identification and mitigation, schedule and budget adherence, and team composition and structure. Teams shared similar behaviours and concerns; however, their focus was primarily on technical risks rather than managerial risks, resulting in gaps in their project awareness. Schedule delays and funding cuts were common challenges across teams; however, their root causes varied and were often not identified in initial risk assessments, resulting in teams responding reactively throughout the design process. This highlights the need for sharing project performance data for design teams in a student-accessible format to increase the likelihood of teams (especially newly formed ones) successfully bringing a project to completion.