SPACE EDUCATION AND OUTREACH SYMPOSIUM (E1)
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Author: Mr. Jeremy Straub
University of North Dakota, United States, jastraub@gmail.com

SPACE TECHNOLOGY, PROJECT MANAGEMENT, DISCIPLINE-SPECIFIC AND OTHER EDUCATION FROM A SMALL SATELLITE PROGRAM AT THE UNIVERSITY OF NORTH DAKOTA

Abstract

Work has been ongoing at the University of North Dakota (since 2011) to involve students from both STEM (science, technology, engineering and math) and non-STEM disciplines in the development of a small CubeSat-class spacecraft and the benefits that they have enjoyed. The assessment of educational benefits created has been a key program feature since its inception. Initially, we sought to characterize the discipline-of-participation (e.g., computer science for students on a software team, electrical engineering for students on an electrical design and development team) related benefits. However, responses to our initial surveys indicated that many of the benefits that students were enjoying were not captured by this work. We also encountered difficulty characterizing the benefits that were enjoyed, due to the diverse nature of the activities that students were performing.

This paper presents an overview of small spacecraft development work at the University of North Dakota and its objectives. It provides an overview of the types of educational assessment tools that have been used throughout the project (ranging from locally-created surveys to well-known assessment techniques such as the Undergraduate Research Student Self-Assessment) and the benefits and drawbacks of each type. We describe our search to identify both what benefits students thought were important prior to participation (i.e., why they joined) and our work to characterize whether these benefits have been enjoyed, and to what extent. We describe the limitations of various styles of assessment in answering this question and – more generally – in the characterization of any project or activity where participant goals and activities are divergent. We conclude by presenting the product of this search: a characterization of the benefits that students have enjoyed, characterized quantitatively, and a discussion of other qualitative benefits that could not be characterized.