

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

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CROSS-TRAINING SCHEME FOR AN ACTIVE LEARNING PROGRAM ON SPACE TRIALS IN
THE SPACE EDUCATION PROGRAM OF THE TOKYO UNIVERSITY OF SCIENCE

Abstract

The Tokyo University of Science (TUS) developed the TUS Space Education Program (T-SEP) funded by the Aerospace Science and Technology Promotion Program of the Ministry of Education, Culture, Sports, Science, and Technology (MEXT) in 2017, which has been conducted for six years. One of the most important programs of the T-SEP is an active learning program that utilizes parabolic flight and CANSAT. Active learning is an effective method for learning systems engineering. An active learning program based on a space base mission is effective for acquiring system management skills and learning various systems, as space missions have restricted constraints and require high-reliability and adaptation to failure. Cross-training is an effective learning strategy for improving educational skills and understanding deeply technical issues. A unique and effective feature of this program is the opportunity offered to previous participants to support instructors, acting as "mentors" for the current students. During the past four years of the T-SEP, more than 30 mentors supported the program, not only as assistants during lectures and hands-on training but also as instructors of the active learning group work, thereby effectively utilizing their own experiences. Such experiences are vital for the mentored students to improve their technological skills as well as their education and team management skills. As we expect that the participants will become leading educators, engineers, and researchers, these experiences are useful for the teaching of their future students and/or leading and coordinating of future teams. In addition, the mentors demonstrated an outstanding performance for the project direction in this year's program. When the parabolic flight schedule was postponed, they spontaneously proposed new events and formulated a backup plan to maintain participant motivation. We are now seeking a new educational structure to

utilize the project level control performance of the mentors. In this paper, we introduce the results of four years of the T-SEP and cross-training trail. The effectiveness and educational knowledge of these active learning programs, in particular, the cross-training scheme, are discussed briefly.