

IAF SPACE EDUCATION AND OUTREACH SYMPOSIUM (E1)  
Space Culture – Public Engagement in Space through Culture (9)

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INGENIOUS SPACE-BASED HANDS-ON LEARNING TOOLS TO PROVIDE SPACE SYSTEM  
ENGINEERING KNOWLEDGE

**Abstract**

Nowadays, space engineering is a thriving sector of modern engineering and seems to have unlimited potential for exploration and innovation in the coming days. There are several graduate and postgraduate degree programs in space engineering. Moreover, online education and resources for space engineering are growing continuously in terms of availability and quality with recent cultural shifts and circumstances, which enhance the learning experience and development of new knowledge and technology of the participants regardless of the geographic access. To acquire the technical expertise required for satellite technology and all cross-disciplinary skills, a learner must have hands-on experience in this field. A few satellite training kits are available globally, such as ESAT, EYASSAT, PUMPKIN CUBESAT KIT, CUBESAT KIT 2.0, ORBICRAFT-PRO 1U HEPTASAT for professors/instructors and students to learn basic satellite engineering by hands-on experience. The prices of these kits are varied from USD 8500 to USD 15500, which is quite expensive. The maker of these kits offers training to learn the kits that are also expensive to afford. To engage more students/instructors worldwide, develop the skills, and make learning hardware affordable, a satellite training kit has been built, together with a comprehensive curriculum guide that could be learned individualistically or with the help of professional instructors. The mission of satellite training KIT is to collect physical variables, such as UV index, temperature, air pressure, humidity, GPS coordinate Data orientation data, and live video feeding. This training KIT can be launched using a hydrogen balloon and collected real-time data. The training method is designed for four different (education) levels: High school students, college students, undergrads, and professionals. This paper presents how we developed a kit in Bangladesh during the pandemic to give the best satellite building experience at the lowest possible price by utilizing local components. The designed kit started attracting students and instructors in space engineering, and currently, they are taking the training. This paper will also discuss the training technique we are following on emphasizing science, technology, engineering, arts, and mathematics (STEAM) and the lesson learned from the project.