

IAF SPACE EDUCATION AND OUTREACH SYMPOSIUM (E1)  
New Worlds - Non-Traditional Space Education and Outreach (7)

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MAKERSPACES QUIETLY INFLUENCING THE CURRENT AND FUTURE SPACE EDUCATION  
CASE STUDY AND ROAD-MAP FOR SPACE WORKFORCE DEVELOPMENT**Abstract**

From the first man in space Yuri Gagarin achieving a major milestone on April 12th, 1961 to the International Space Station great strides have been made. But for quite sometime most of the experts in the space industry have followed a traditional research, business and educational model, at the same time, the space community has remained mostly among itself. But to keep innovating we need to explore new non-traditional educational models and environments that can enable collaboration, ignite creativity and enhance productivity in the future workforce of the space industry. A Makerspace, is an unorthodox learning space where students can share their skills and collaborate with others in a diverse range of projects, having access to prototyping equipment, use low and high technology, get guidance to lunch start-ups and get involved in the market.

No one goes or work in space alone, therefore this paper aims to initiate the dialogue and examine the influence that makerspaces are having in our current space education and the implications and participation of students in these alternative educational environments. This study describes the process, achievement, difficulties and lessons learned from Space Belong to All (SBA), which was a cross industry, cross cultural, multidisciplinary educational project that involved three Makerspaces from USA, and brought together students, young professionals, space and non-space specialists. The SBA Project included, but not limited to, knowledge transfer, new technology research and post academic and cultural events. Makerspaces educational model provided for the SBA project a platform for tinkering, collaboration, creativity, communication, critical thinking and learning converge for authentic, inquiry-based self-direct learning which are vital skills for the future workforce to innovate and provide an important contribution to the growing space economy, space exploration, cutting edge research along with space entrepreneurial ventures.

We argue that Makerspaces tech educational model is the future of space education. Overall, this work seeks to propose a road map for developing a strategic educational partnership between space organizations and makerspaces for workforce development.