THE ROLE OF MAKERSPACE IN SPACE SCIENCE EDUCATION: HOW LEARNING AND SPACE TECHNOLOGY FORMS AN ATTRACTIVE CURRICULUM FOR CREATION IN DIGITAL COMMUNITY. S. Hegyi1, Sz. Bérczi2, I. Ságodi3, M. Szabó4, P. G. Vizi5, 1Pécs University, Dept. Informatics, H-7624 Pécs, Ifjúság u. 6., (hegyis@gamma.ttk.pte.hu), 2Eötvös University, Faculty of Science, Dept. of Materials Physics, Cosmic Materials Space Res. Group, 1117 Budapest, Pázmány P. s. 1/a. Hungary, (bercziszani@caesar.elte.hu), 3Szekszárdi Garay János High School, H-7100 Szekszárd, Szent István tér 7-9. Hungary, (sagodi62@freemail.hu), 4Petrik Lajos Szakgimnázium, H-1146 Budapest, Thököly út 48-54. Hungary. (dr.szabo.marianne@petrik.hu), 5MTA Wigner RCP H-1121 Budapest, Konkoly Th. 29-33. (vizi.pal.gabor@wigner.mta.hu)

Introduction: Makerspace in the school can help forming creative ideas, plans, design, a route toward finally the student’s product. One example is the minimal practicing space probe model, which have been realized in the Hunveyor design and construction. The program is initializing the value-creating activities in education. It can be a new form of creation and knowledge transfer for space exploration in the digital community.

Makerspace is an environment for students to form innovation technology: The makerspace - the creators’ space - is an environment for innovation technologies, where student’s communities can experiment, demonstrate, design and build new products (objects, systems). The makerspace is, in fact, a collaborative-creation-centered learning environment with students in the center who share their knowledge, resources, build and create. Space provides access to innovative technologies, equipment, software, and support with expert mentors. Motto: The space is open to every student who wants to learn and create as a team member. Here, a multidisciplinary result of the joint creative work of students studying in different disciplines can be created. Here you can play a role differently, the ability to renew thinking, innovation. The background to this is the modern infrastructure that prepares for the change of technological era, the university creative space. With its 21st century demand for traditional and computer-controlled equipment, digital skills development resources. A team-building base prepared for learning (learning over education), with its openness, contributes to the understanding, acceptance, and promotion of social innovations in present and future technologies. The creative community space (a room) demonstrates the unity of artificial intelligence (AI) and cyber-physical system elements, IT, software technology, and mechanics and electronics. The world of makers, supports data and communication technologies for student research and development, and provides a Gigabit speed network for information processing.

Creative space in university: The creative space, a university autonomous base, is where human resources are made up of young people and the inspiring digitized tool park. Thus, with the capabilities of networking technologies, makerspace, a state-of-the-art university learning base, goes beyond the traditional classroom environment.

In summary, this is the technological environment, the open learning space based on the creativity of creative student communities, the student’s research work, which has a material warehouse, a hand and computer designer, and tools and tools to support artistic work, as well as a product showroom and gallery. The makerspace is basically a "library" of digital skills and technologies.

At the university, the world of makerspace can be linked to curricula and "co-curricula" without credits. However, "co-curricula" are not specifically related to academic learning, but to innovation, to the creation of prototypes with real applications, it can be done.

Realisation of the creative space: The Hunveyor program: In the late 90-ies we realized a preliminary version of the creative space on Pécs and Eötvös Uni-
Universities. The idealized example was the Surveyor program at NASA in the 60-ies years. We formed segments of the activities, which formed modular units of creative space: Some of them have been realized: (Digital) Planning System (later), Measurement Technology, Traditional and Digital Tool Park (Production Systems- CNC, 3D Printing, Laser Cutting, etc. later), Programmable Robots (and Drones later), Microelectronics Block, IT Ecosystem (High Speed Network, later).

Goals of the Digital Community Space: Balancing between technology and life. Technology is developing at an amazing speed. We need to understand innovations as soon as possible and get the 21st century digital skills. So we need new student-centered community places to get to know, try out innovative products and procedures. The "makerspace culture" brings the latest technology in the digital community environment where students can meet the latest developments. The creative space can therefore be (ne), a 'second' learning environment for the Universities in Hungary. We intended realize these benefits during the Hunveyor program. In this way, our institution will be able to cooperate with regional economic organizations, industrial parks, natural science technicians, artists, teachers and interested citizens in the region. The goal is to inspire the minds of our students for practical learning, creation, construction and invention.

Summary: Makerspace triggers art-centered learning (constructing minimal space probes) in the makerspace (creative space) that meets the growing demand for practical learning and multidisciplinary cooperation across multiple disciplinary domains. Stimulating educational environment and synthesis in education.

The keywords help in orientation of gradual building up of this program: Space exploration, space technologies, creative space (makerspace), creativity, disciplines, technology, innovation, creation, digitization, micro-electronics, artificial intelligence, learning, co-thinking, teamwork all were involved in our Hunveyor program, which had an example: the Surveyor program in the 60-ies at NASA. For the Husar rover example was the Mars Pathfinder at late 1990-ies.