

Maker Education as Means for Early Entrepreneurial Education: Evaluation Results from a European Pilot Action

Authors : Elisabeth Unterfrauner, Christian Voigt

Abstract : Since the foundation of the first Fab Lab by the Massachusetts Institute of Technology about 17 years ago, the Maker movement has spread globally with the foundation of maker spaces and Fab Labs worldwide. In these workshops, citizens have access to digital fabrication technologies such as 3D printers and laser cutters to develop and test their own ideas and prototypes, which makes it an attractive place for start-up companies. Know-How is shared not only in the physical space but also online in diverse communities. According to the Horizon report, the Maker movement, however, will also have an impact on educational settings in the following years. The European project 'DOIT - Entrepreneurial skills for young social innovators in an open digital world' has incorporated key elements of making to develop an early entrepreneurial education program for children between the age of six and 16. The Maker pedagogy builds on constructive learning approaches, learning by doing principles, learning in collaborative and interdisciplinary teams and learning through trial and error where mistakes are acknowledged as learning opportunities. The DOIT program consists of seven consecutive elements. It starts with a motivation phase where students get motivated by envisioning the scope of their possibilities. The second step is about Co-design: Students are asked to collect and select potential ideas for innovations. In the Co-creation phase students gather in teams and develop first prototypes of their ideas. In the iteration phase, the prototype is continuously improved and in the next step, in the reflection phase, feedback on the prototypes is exchanged between the teams. In the last two steps, scaling and reaching out, the robustness of the prototype is tested with a bigger group of users outside of the educational setting and finally students will share their projects with a wider public. The DOIT program involves 1,000 children in two pilot phases at 11 pilot sites in ten different European countries. The comprehensive evaluation design is based on a mixed method approach with a theoretical backbone on Lackeus' model of entrepreneurship education, which distinguishes between entrepreneurial attitudes, entrepreneurial skills and entrepreneurial knowledge. A pre-post-test with quantitative measures as well as qualitative data from interviews with facilitators, students and workshop protocols will reveal the effectiveness of the program. The evaluation results will be presented at the conference.

Keywords : early entrepreneurial education, Fab Lab, maker education, Maker movement

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