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EUROPEAN POLICYBRIEF

Education of young people for social innovation and entrepreneurial practices in makerspaces



Entrepreneurial skills
for young social innovators
in an open digital world

The first policy brief of the EU-funded project DOIT explains how Europe can step up and make early stage entrepreneurship education for young people more practice-based and effective. The suggested approach is empowering primary- and secondary-school pupils (6–16 years old), together with facilitators, to co-create solutions for social and environmental issues. Makerspaces, open innovation methods and creative digital tools play a key role in the “learning by doing” approach. Broad take-up could nourish in more young people attitudes and skills needed by innovative citizens, businesses, and employees.

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INTRODUCTION

Three strands of DOIT's learning approach

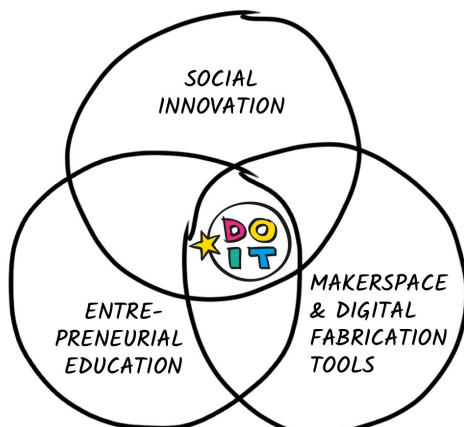


Figure 1: Three strands of the DOIT learning approach

The DOIT project, a Horizon 2020 Innovation Action, trials a new practice-based approach for developing digital, social and entrepreneurial competences of young people (6–16 years old) in makerspaces. The project recognises that fostering entrepreneurial mind-sets, attitudes and skills of young people for innovative ventures should begin early on in creative and collaborative settings. Makerspaces provide such settings to promote creativity, self-confidence, team-work and other competences of entrepreneurial people. “Makerspaces” is used as a general term for all creative environments that are based on maker principles, such as Do-It-Yourself (DIY), digital tools, and sharing of tools and knowledge; these include Fab Labs, Hackerspaces and various other makerspaces. Makerspaces are not a theoretical concept, but a rapidly growing number of creative centres where people get together and work on projects, using various digital and other productive tools.

The DOIT project suggests mobilising makerspaces, within schools as well as for extracurricular activities, to empower primary- and secondary-school pupils, together with teachers and other facilitators, to develop innovative solutions for social and environmental issues. Such issues, perceived in the local context, can engage young people in maker activities, aimed to acquire and apply creative and entrepreneurial competences.

The quest for entrepreneurial youth in Europe

Europe needs more people with an entrepreneurial mind-set and skills able to turn creative ideas into successful economic and social innovations. Nourishing entrepreneurial young people has been on the agenda of educational policy-makers and institutions in the European Union for many years. Among the four EU objectives of the common *Education and Training 2020* framework adopted in 2009 was “*enhancing creativity and innovation, including entrepreneurship, at all levels of education and training*”. In the context of the economic crisis, high youth unemployment and rapid technological change, this is all the more important.

For some years now the subject of Entrepreneurship Education (EE) has been present in schools. There is a growing awareness that entrepreneurial attitudes, knowledge and skills can be learned, and that their active use benefits the economy and society as a whole. But the addition of EE to traditional curricula and forms of teaching and learning has not generated tremendous results. As evidenced by a comprehensive Eurydice report on EE in Europe (2016), so far the goals communicated by the European Commission (2012, 2013) to “rethink” and “open up” education in order to equip students with the skills needed by innovative citizens, businesses and employees have not been achieved. Among the reasons are that schools often fail to adopt open educational practices, collaborate with centres of creativity and innovation, and seize the opportunities provided by digital technologies.

The EU state of affairs in entrepreneurship education in schools

The European Commission’s Communication on *Rethinking Education* (2012) called for a fundamental shift in education to develop the skills, especially ICT and entrepreneurial skills, required for increasing levels of employability, new business creation, and active citizenship. A report of the European Eurydice network, published in the context of the Communication, showed that schools were paying insufficient attention to the development of such transversal skills. The report highlighted that their integration in curricula requires schools to change the way they teach and target and assess learning outcomes (Eurydice 2012). Regarding Entrepreneurship Education (EE) in Europe, the situation is still mostly “business as usual”. Support for EE should be expanded to initial teacher education and regular training, and involve currently “unusual” enablers of practical experiences of teachers and students.

Social innovation and Open Educational Resources in European policies

Regarding high-level policies, the proposed focus of DOIT on societal issues ties in with the Europe 2020 Strategy for Smart, Sustainable and Inclusive Growth (2010) and relates to European measures promoting social innovation and businesses. These measures started with the Social Business Initiative (2011) and can be found within several current programmes such as the Employment and Social Innovation Programme (2014–2020).

Social innovation and entrepreneurial competences, including a special focus on digital skills, are likely to play an increasingly role in future programmes. Furthermore, the updated *Education and Training 2020* (ET 2020) framework of the EU member states (November 2015) emphasises relevant learning outcomes which require innovative open and digital educational methods. As highlighted in the European Commission’s Communication on *Opening Up Education* (2013), ICT-enabled open educational practices and resources allow to make teaching and learning more innovative, flexible and effective. Innovative open practices are a core element of the DOIT approach, including easy access to and usage of open educational resources (OER) for learners, both pupils and teachers/facilitators.

Makerspaces as practice-based co-creative learning environments

The DOIT project suggests using makerspaces, within schools and external, to promote practice-based, co-creative development of digital, social and entrepreneurial competences of pupils as well as educators. Makerspaces can allow them to connect to “real-world” issues and seize opportunities provided by new digital technologies. Pioneering educational practitioners in Europe already present their makerspace activities at conferences and in online articles, but an overview of the current situation of educational makerspaces across Europe is not available. Results of an online survey conducted by the EU-funded project MakEY – Makerspaces in the Early Years (2017, 633 questionnaires) indicate that awareness of makerspaces among early years education practitioners is low. In their survey only 25% of the 400 educational respondents had heard about makerspaces, 18% participated in and 16% organised makerspace activities. The results are not representative for the situation across Europe though because most survey participants were from Iceland (254), Romania (164), UK (80) and Denmark (55).

RESEARCH PARAMETERS

DOIT's aim

The overall aim of the H2020 Innovation Action DOIT is to allow more young people to develop innovative and entrepreneurial mind-sets, attitudes, skills, and actual practices. DOIT promotes a practice-based approach, using makerspaces for early stage innovation and entrepreneurial education of primary and secondary school pupils in the age range of 6–16 years. The project has an ambitious innovation action programme, creating and offering to innovators a wide range of activities to make a difference.

DOIT's programme for young social innovators

DOIT creates, validates and spreads a new approach for young people to develop entrepreneurial mind-sets and skills for turning creative ideas into future social innovations, business and employment opportunities. The DOIT approach aims to empower primary- and secondary-school pupils (6–16 years old), together with educators and other facilitators, to use open innovation methods, digital maker and collaboration tools to tackle societal problems. Regional

makerspace pilots, open educational resources (OER), a platform for sharing ideas and success stories, and other activities will allow the young people to develop entrepreneurial know-how and experience being a digital social innovator.

Trialling the DOIT learning approach in two pilot phases, in 10 regions, with 1.000 children

Our pilots in 10 European countries trial the DOIT learning approach with 1.000 children and educators. The learning journey of the participants spans the whole cycle from identifying a local issue to presenting a co-created potential solution in public. The focus of the research on the pilots is allowing participants to reflect, share and analyse the experiences and outcomes of the co-creative activities, especially looking at whether the young makers develop skills, attitudes and ideas for innovative and entrepreneurial practices in the local context. The learning outcomes will be presented in the next Policy Brief, scheduled for publication in autumn 2019.

Phases and results of the DOIT innovation action programme

The DOIT innovation action programme will be implemented in several phases. In the first phase we developed the core DOIT programme, then the project focused primarily on preparing the regional pilots, which started in September 2018. In parallel, the online platform and open educational resources (OER) have been designed, ready to be fully implemented, used and extended in the current phase, until November 2019; this second phase will also include two rounds of an online pilot, an online competition for innovative young makers and first roll-out activities. In the final roll-out phase, a massive open online course (MOOC) for DOIT facilitators and other activities engaging diverse target groups will take place. The project will disseminate the DOIT approach and mobilise stakeholder engagement to adopt and scale its application in the participating countries and across Europe. The target in the medium to long term (10-year horizon) is learning outcomes which enable digital social innovation, businesses and employment of young people.

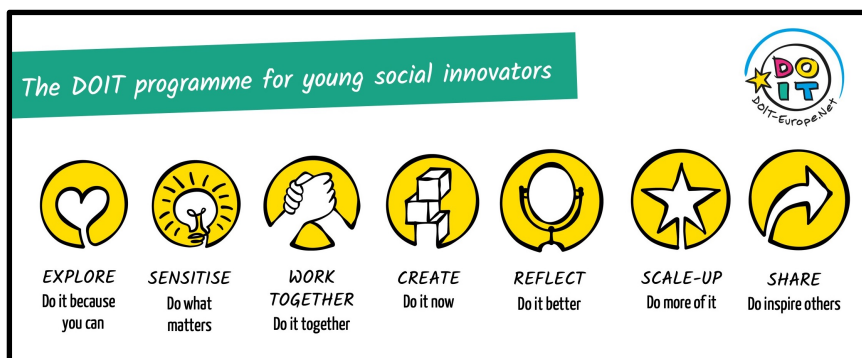


Figure 2: DOIT's programme for young social innovators from 6 to 16 years

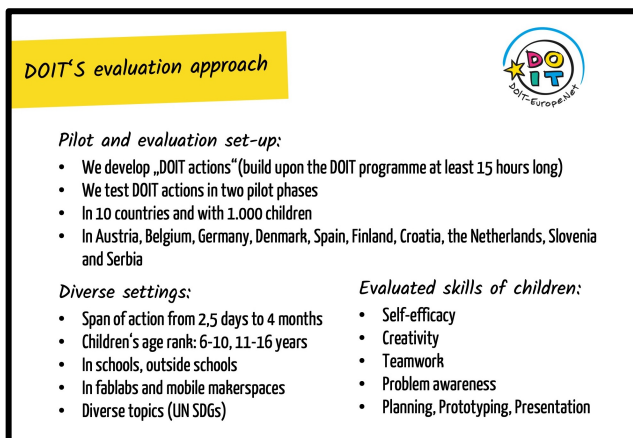


Figure 3: DOIT's evaluation approach



Figure 4: Examples of DOIT's results

POLICY IMPLICATIONS AND RECOMMENDATIONS

Policy implications

The Horizon 2020 Innovation Action DOIT suggests applying practice-based learning in makerspaces to foster digital, social and entrepreneurial skills of young people (6–16 years old). Specifically, the project proposes co-creative maker activities addressing societal issues. The DOIT approach aligns with high-level policies, including the Europe 2020 Strategy for Smart, Sustainable and Inclusive Growth, initiatives promoting social innovation and businesses, and crucial educational goals communicated by the European Commission (*Rethinking Education*, 2012; *Opening up Education*, 2013) as well as set in the updated *Education and Training 2020* framework of the EU member states (2015).

Recommendation

Raise awareness of makerspaces as environments for practice-based development of digital, social and entrepreneurial skills of young people

Makerspaces set up in some schools as well as external ones are already being used for innovative projects, and educators are enthusiastic about children's achievements. However, many schools and teachers are currently not aware of such learning environments, despite their great potential for effective project-based and problem-solving learning. In order to raise awareness, the topic should have a prominent place on the agenda of educational institutions. The existing evidence for innovative maker education and learning outcomes should be collated and showcased.

Recommendation

Expand the number of pilot makerspaces in schools, and of educational programmes in makerspaces

Policy makers and agencies should promote setting up more makerspaces in schools to explore and evaluate educational benefits. Regarding the many existing external makerspaces, they often already have an educational component which could be expanded and turned into regular programmes.

Recommendation

Promote maker education with a focus on social and entrepreneurial mind-sets and skills

A narrow focus on skills in STEM (Science, Technology, Engineering and Mathematics) will hardly allow young people engaging and meaningful learning experiences. Using STEAM (STEM + Arts) rather than just STEM approaches might allow for a more effective approach, providing more tools and attracting more pupils. Addressing social and environmental issues in maker education, which young people encounter in their local environment and want to act upon, will even strengthen learning outcomes.

Recommendation

Support collaboration on teacher training and local community projects

Teachers unfamiliar with maker education will need some training on how to facilitate making by pupils and students. Existing community makerspaces could provide a basis for collaboration on training courses and local projects involving teachers and students. Otherwise, setting up a community makerspace including, among other functions, “learning by doing” of teachers and students, could be the project.

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