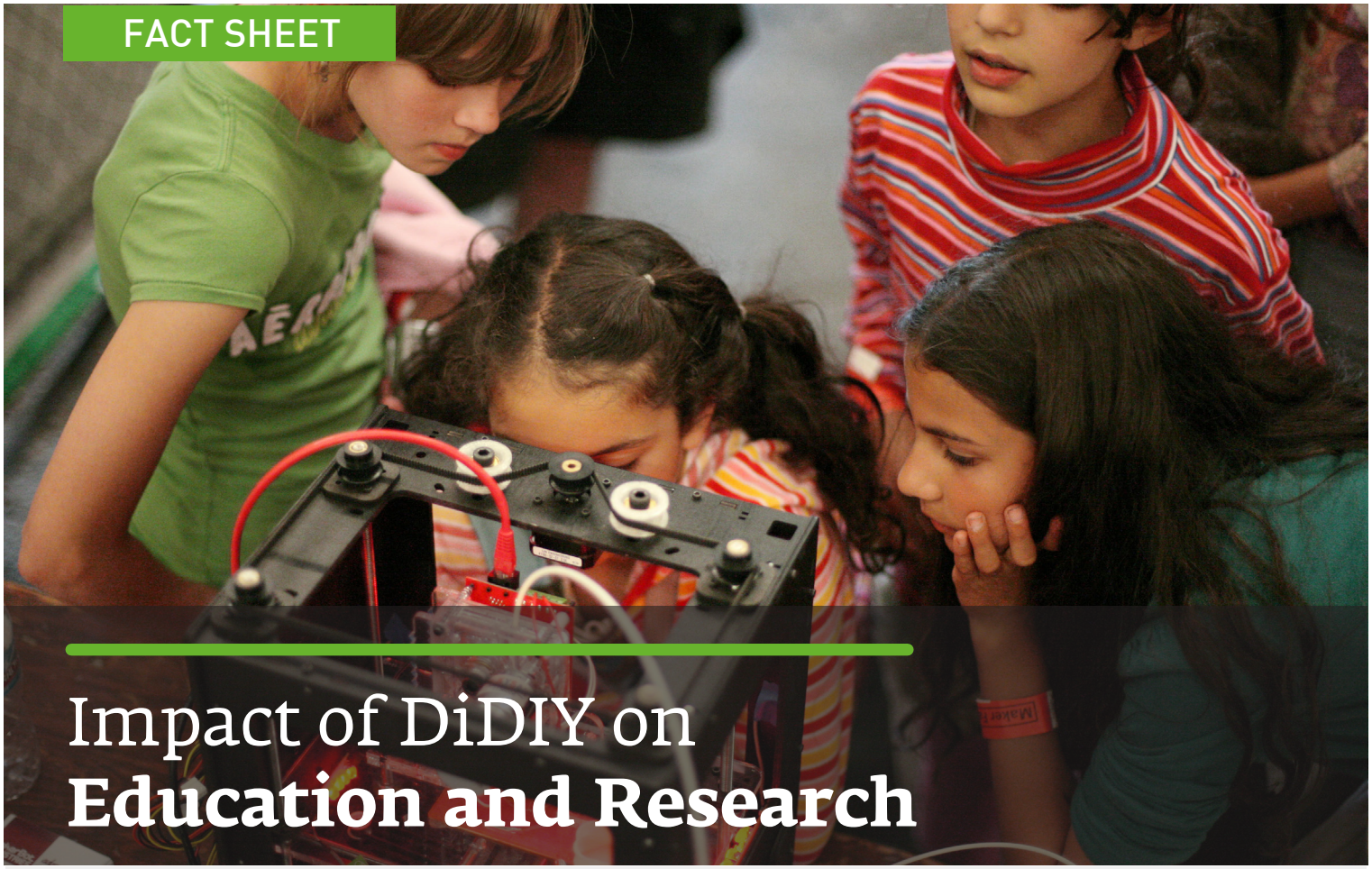
FACT SHEET



Impact of DiDIY on **Education and Research**

This fact sheet provides the bases to discover DiDIY and its impacts on European society. It is part of a series of fact sheets produced by the European research Project DiDIY, aimed at providing inputs to find together answers to questions such as:

Is Europe really ready for DiDIY? Does Europe really want DiDIY? Does Europe really need DiDIY?

www.didiy.eu

DiDIY
DIGITAL
DO IT YOURSELF

Digital Do-It-Yourself ("DiDIY" for short) is a complex phenomenon, involving social, cultural, technological, economic, and psychological dimensions, stemming from the new ability to **mix physical and informational components** into simple and affordable systems such as 3D printers and Arduino boards.

We call it "Atoms-Bits Convergence", to emphasise that what is happening could become a **new alphabet of knowledge**, hence a new ABC, that may ground and reshape our society thanks to the widespread availability of digital tools that are much cheaper and easier to use than they were just a few years ago, and to the increasing familiarity of many people with such tools. The emergence of the Internet of Things, as the world-wide inclusive ABC system, is further amplifying the potentialities of DiDIY.

But **where these changes are going to lead us is still to be determined**, and is at least partly dependent on the choices that the relevant actors (governments, industries, public administrations, schools and universities,...) are making and will make in the immediate future.

FACT

DiDIY builds on shared knowledge, for the benefit of learning and research

It is part of human nature to share knowledge. Digital networks have significantly reduced the cost associated with it, paving the way to the collective production of new knowledge. A large part of such information **is licensed under equal conditions as open access or free knowledge** on online communities such as Thingiverse *(www.thingiverse.com)*, Arduino forums *(forum.arduino.cc)*, OpenDesk *(www.opendesk.cc)*, and Instructables *(www.instructables.com)*. The DiDIY Project blog *(www.didiy.eu/blogs)* and Resources area *(www.didiy.eu/resources)* showcase a series of significant real-word examples of DiDIY in education and research, as well as in other fields..

FACT

DiDIY facilitates the production of prototypes and other artefacts to be used in educational contexts

3D printers and other devices for digital fabrication **make it much easier for students of design and engineering to produce prototypes.** However, applications in other school and research subjects are possible. Students of history can build detailed 3D models of historical artefacts, while students of medical or biological sciences can create plastic models of human organs or life forms. To maximise the benefits of DiDIY in education, coordination among all stakeholders (museums and schools, teachers and school managers, etc.) is needed, as well as more support for teachers (ad-hoc training and documentation on DiDIY technology, information on how to minimise costs and waste of material in DiDIY manufacturing, etc).

FACT

DiDIY is already reshaping education

In Europe and elsewhere, DiDIY **is currently being incorporated in schools** and it is already exploited for extracurricular activities such as coder dojos, robotics contests, cooperation with existing fab labs or maker spaces, etc.
Schools are now progressively moving from a content-delivering role to a more broad approach, including the acquisition of transversal skills such as a flexible attitude to cooperation, communication and entrepreneurship. For its very nature, **DiDIY can support and enhance the acquisition of the so called "21st century skills"**, which comprise creativity and innovation, critical thinking, problem solving, decision making, and an open attitude to life-long learning. While the level of change required in schools is significant, it is best supported in the short to medium term by changing the emphasis of existing curricula and assessment, encouraging schools to use multiple types of assessment

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FACT

DiDIY can best affect education when teachers feel comfortable with new technologies

New technologies possess the potentialities to drive **new approaches of innovative learning centered around the person and closer to the need of the territory.** The DiDIY-related educational activities can potentially make the school laboratory work meaningful to the student, enhancing the learning experience and helping reinforce motivation.
Creating such new learning environments requires a systems approach which must include building teacher capacity. Innovating education is not possible without innovating teaching schemes. Of crucial importance is the ability of national systems to build a **skilled and dedicated teacher workforce,** attracting and retaining qualified teachers and ensuring that they continue to learn throughout their careers.

FACT

National and European institutions can play a key role to overcome the hurdles in the uses of DiDIY for learning purposes

All European countries are facing similar problems related to employability of young and senior citizens. We believe that the European Commission together with all European national systems should continue to **drive investment in education**. Giving young students the opportunity to better learn science also by means of DiDIY-related activities in school will lead to a **better informed future citizens**, able to exploit the potentialities of research results, understanding its limitation and ethical implications. A cultural shift is needed to recognize DiDIY and new technologies as an opportunity to improve the (digital) culture of the society. Work needs to be done locally to make school deans aware of the need for school teachers and educators. Strengthen the connection of schools with the local resources, allowing students to engage in goal-oriented activities leveraging on new digital technologies to tackle real-life problems, is a key issue.

To know more about Digital Do It Yourself...

The DiDIY project has ended in June 2017. All its results, however, are still available on the DiDIY website, in order to help everybody to understand what DiDIY is, the impacts it will have on the European society, and what to do about it. These results include, but are not limited to:

- More specific fact sheets on the impacts of DiDIY in work, creativity, intellectual property, etc;
- Foundational interpretation of DiDIY;
- A Knowledge Framework and a Vocabulary on DiDIY;
- A DiDIY Manifesto for Positive Social Change;
- A DiDIY Guidance Manual, and several DiDIY Policy Guidelines

All partners of the DiDIY Consortium continue to work in this field, and are interested in cooperating with other organisations, from joint research to training and evangelisation activities on DiDIY and related topics.
To contact them, please visit www.didiy.eu

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The views expressed in this document do not necessarily retlect the views ot the EC

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