# “3D printing technology aims students understanding maths and recycling procedure”

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## Abstract

3D printing is a process that turns digital files into solid objects using a desktop 3D printer. Once the digital files are created, either by using computer design software or a 3D scanner, they are sliced into sections and a 3D printer stacks the raw material into layers. 3D printing uses a new approach in education. As 3D printers and scanners become more affordable, universities and schools are in a better position to purchase more digital manufacturing systems and to train their students in using this technology (Junk et al, 2015).

At the European Union level, the mathematics curriculum is primarily aimed at supporting students in decision making and problem solving, using mathematical knowledge and skills. However, there are students who face some learning difficulties related to mathematics. Students usually learn more by “writing” mathematics and less by “thinking” as mathematician. In particular, 6% of students lack mathematical skills and show deficiencies in arithmetic skills, which could be attributed to various cognitive processes. The answer to the need to address the lack of skills could be sought among other areas and fields of knowledge and that of technology and even in the innovative application of 3D printing.

Moreover, the necessary material for 3D printing, called PLA (plastic), could be replaced by a special thread that would be created by students with recycled material while increasing students' interest in protecting the environment and reusing plastics. The goal is twofold, on the one hand the protection of the environment is achieved and on the other hand it produces thread from the plastic, necessary for the use of the printer.

In this light, the application for the 3D-ReMath Project assumed that 3D printing could help primary and secondary school students better understand mathematics and at the same time become familiar with the concept of recycling. The innovation of the 3D-ReMath project, funded by the European Commission, therefore lies in the fact that it managed to combine three different concepts, to create corresponding educational material and to train teachers and students with multiple and beneficial fields such as: 3D printing (cost reduction by creating a special thread instead of buying it), mathematics (introduction of an educational method to reduce inequalities) and ecology (raising awareness on reuse of materials and recycling). Teachers have access to educational material which can introduce the students to a new world where

mathematics, 3D printing and recycling compose an innovative and sustainable way of living.

**KEYWORDS**

3D printing, mathematics, recycling