

Application of 3D printer in school

Most people heard about 3D printing only in the 21st century. However, the idea of a design mapping the drawing arose as early as the 20th century (the 1970s). The first fully functional device from 1984 was the work of Charles Hull, who printed using a light-curing resin a tea cup . The next 30 years are the continuous development of 3D technology, but only the last decade and media interest have meant that 3D printing has been noticed and turned out to be a revolution.

The spectrum of applications of 3D printing is huge, ranging from medicine, through industry, architecture, aviation, to education. It was proved by the British who introduced classes using the 3D printer - Objet 24 at the international ACS Eghon school. One of the teachers at this school thinks that having 3D printers at school is fantastic because they allow students' amazing ideas to be turned into real projects.

3D printing technology carries a number of possibilities that can be used at school.

First of all: a way to increase the efficiency and attractiveness of classes.

Students will better remember and understand the knowledge they are given if they can engage in the learning sense of touch, and participation in designing and printing the model can be a great adventure. In grades I-III it is a way of learning through play. Many companies have prepared appropriate versions of the application for younger students so that they can learn how to use this device. In classes IV-VIII you can introduce 3D printing for science subjects such as: mathematics, chemistry, physics or biology. With the help of a 3D printer, students can prepare spatial models of geometric figures, chemical compounds, etc.

Secondly: low cost production of teaching aids, awards.

Teachers can print:

- Teaching aids and distribute them to students as a photocopier.
- Items that are not available in the teaching aids offer, e.g. building models, historic machines, multi-functional clips, etc.
- Christmas decorations for classrooms.

- Gifts on the occasion of Grandma's and Grandpa's, Mother's Day.
- Prizes for students: medals, cups, trophies, badges.
- Children's Day gadgets.

Third: printing used school items.

School equipment or teaching aids are often destructed or damaged after several years of use. Although the 3D printer at school does not allow printing and replacing a damaged table with a new one, the use of this printing technology can be very helpful in the event of some minor repair by printing some elements of a larger item.

Fourth: modelling and printing.

Creating 3D models seems very complicated at first glance. Many spatial modelling programs offer different levels of difficulty. Access to educational applications means that every student can get involved in the 3D printing process. Autodesk's Tinkercad gives this opportunity. It is a web-based, free application created by programmers from Finland, which also works in a web browser. You can use it to create your own projects and use resources, all you have to do is register. Another program designed specifically for teachers and students is SugarCad, which stands out with its intuitiveness. You can choose the most appropriate interface according to your experience and start modelling. This software requires account registration. However, if you don't feel strong enough to design print models, there are many platforms available that provide free models. One of the most popular is Thingiverse, where you can find objects from various categories (including education) and very useful teaching aids.

Fifth: a source of inspiration and passion.

3D printing technology can be used during interest circles, extracurricular activities. Students can create 3D models according to their interests or carry out some scientific projects. It requires commitment and creativity. Teachers can also become a source of inspiration for their students to create projects to solve the problems of the modern world.

A 3D printer at school can have many applications, but the priority for every teacher is to contribute to increasing the effectiveness of the educational process, so that students can broaden their

knowledge, technical skills, logical thinking, effective planning and team work, so that it becomes a tool increasing their commitment and potential as dynamic thinkers.

It is possible to find more information about 3D printing, including applications, trends and its benefits for Education in the “3DP TEACHERS’ GUIDEBOOK”. Make sure you are following the “3DP TEACHER - implementation of 3D Printing in future education” project’s [Facebook page](#) to be the first to know when the guidebook is published on [project’s website](#).