

Student Laboratory – 3D Printing



Johannes Lohn

By using 3D-Printing, a new solution space can be entered. Advantages such as design freedom, short production time and cheap and fast prototyping are well known, but in order to leverage the new possibilities for production and design, apprenticeship is needed. Vital questions are: How to deal with this new technology? How to get a high quality 3D model? How to reduce support structures and is a part capable or not for 3D-Printing? In this project, the DMRC will strengthen the knowledge transfer between industry and students. Particular areas and faculties in addition to mechanical engineering, like arts or electronics, shall be addressed. The combination of new areas and its perception shows radical

new possibilities for additive manufacturing. New points of views can lead to alternative solutions to current shortcomings. New application fields of AM will be entered. The aim of the project is to enable students to work with AM. In the Student Laboratory theoretical knowledge can be extended by practically working with the machines. When starting a job after university, those students will be able to share their enthusiasm and knowledge with the industry. Knowledge will be multiplied and the impact of AM will grow.

Funded by the University of Paderborn – Award for innovation and quality in teaching

The project is funded by the University of Paderborn. The Direct Manufacturing Research Center won the “Award for Innovation and Quality in Teaching 2014”. With this financial support, three FDM homeprinters and a handheld 3D Scanner can be offered to students for free.

Offers to students of the University of Paderborn

All students of the University of Paderborn are invited to visit and use the “Student Laboratory – 3D Printing”. It is a great opportunity to get to know the world of 3D-Printing in reality and not only in theory. New faculties like electronics or arts shall be addressed. The required support and equipment is offered for free.

1. Introduction to 3D-Printing
2. Introduction to CAD
3. Free usage of 3D Printers
4. Free usage of 3D-Scanning Systems

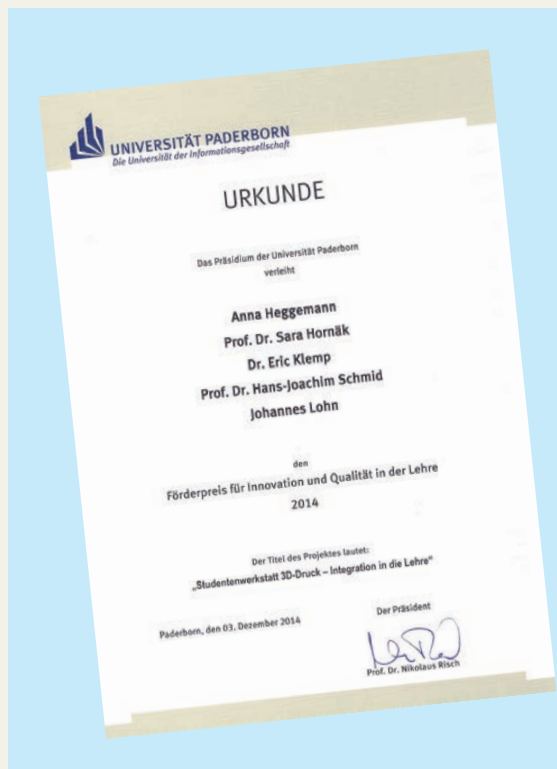


Figure 1: Award for Innovation and Quality in Teaching 2014.



Service for teaching staff of the University of Paderborn

Additionally, the teaching staff of all faculties of the University of Paderborn is invited to implement 3D-printing into their lessons and lectures. The DMRC provides knowledge and support which is needed for a successful implementation into their schedule.

1. Support for the integration of 3D-Printing in new faculties and their education
2. Preparation of lecture notes
3. Interdisciplinary projects
4. Free usage of the equipment of the Student-Laboratory "3D-Printing" for apprenticeship

Achievements

Since its opening in March 2015, more than 200 students have gotten to know the advantages of the student laboratory. For example, 130 students of

mechanical engineering passed the class "Additive Manufacturing" and discovered the secrets of 3D-Printing at the Student Laboratory. In the area of art sculpture, three seminars were offered and about 50 arts students gained their first experiences in Computer Aided Design (CAD), 3D-Scanning and printing. The results of these seminars will be presented in an art exhibition in 2016.

During the initial test phase of the student laboratory it became clear that a machine managing system is required. As a result, an online reservation system for the 3D Printers has been implemented to guarantee good working conditions without waiting times that, at the same time, allows a high occupancy rate.

In order to share further information about the student laboratory, a homepage has been set up. The booking system is easily accessible.