UDG

University of Donja Gorica

Education and training of young associates in the field of 3D

Study Visit on Xihua University (PR China)

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About Xihua University (Chengdu, PR China)

Xihua University was founded in 1960. In Chengdu. In the beginning it was established as Sichuan Institute of Agricultural Machinery. In the year of 1983. it was renamed to Sichuan Institute of Technology and in 2003. after joining with Xihua Pedagogical College it was named Xihua University - the name under which it is known today. Xihua University is consisted of 22 schools and colleges with 66 bachelor degree programs, 53 master's degree programs of three years and 13 professional master's degree programs of two years. University owns an impressive library with over 2 million hardcopy books and around 1.6 million e-books. XHU also owns great number of laboratories and testing facilities for development of automotive industry, safety control, special materials, product design and 3D technology, food biotechnology, energy efficiency etc. There are around 41.000 students from 23 Chinese provinces and from around the globe studying on Xihua University. Number of employees currently counts around 780 professors and associates, 962 lecturers and 598 supporting staff. All teaching buildings and student dormitories are located in student campus which also possesses great number of sport and recreational facilities.

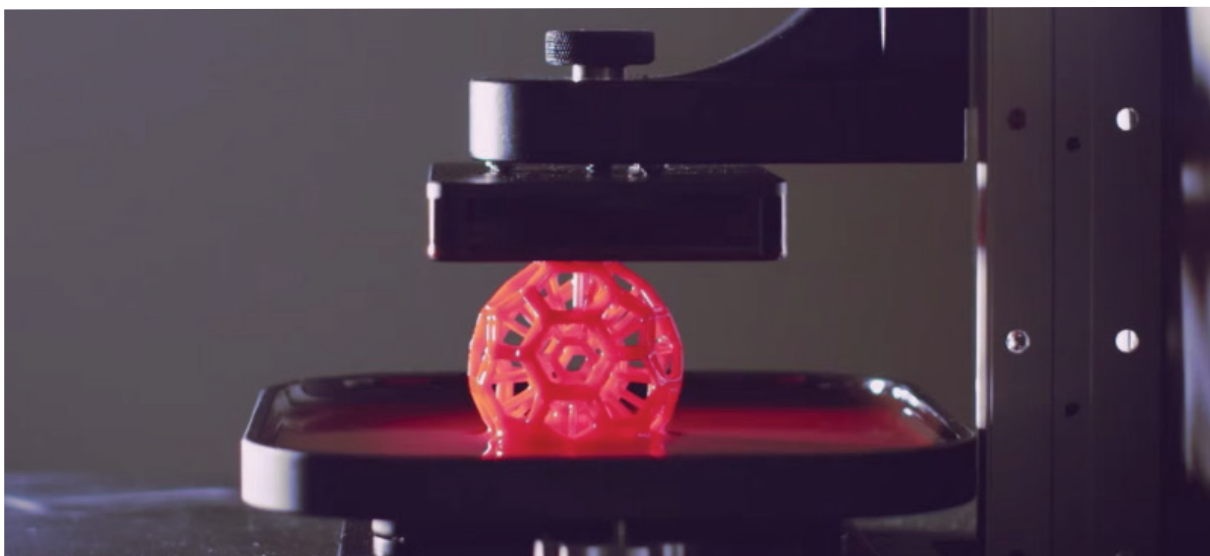## Cooperation of Univesity of Donja Gorica and Xihua University

In order to develop an international cooperation and education of students and associates in the field of 3D technology, University of Donja Gorica established cooperation with Xihua University by which students and associates spend one semester on XHU. Three UDG associates are currently in XHU, spending the summer semester 2016/2017 educating and cooperating with XHU professors in the field of 3D technologies. The purpose of this visit is to improve and develop ProDe laboratory (supported by Idea Lab) which is part of UDG. Students studying at XHU, have a chance to attend classes on all faculties which include usage of 3D technology but also to learn together with their Chinese colleagues. By attending these classes, UDG students are gaining theoretical knowledge and through direct cooperation with professors and assistants they get a chance to work on different projects. UDG associates are constantly in touch with their Chinese colleagues which helps them to overcome every problem which they might have during work.

This cooperation is a pilot project – it is the first exchange between these two universities, and it represents the foundation for the future cooperation so that more and more students and associates can be educated in the field of 3D technologies.

3D technology in China

China is the world's centre of mass manufacturing. Latest reports reveal that China is overtaking the US in terms of 3D printer sales. The Chinese 3D printing market has grown substantially. Just 34,000 printers sold in 2014 and 77,000 found a home in 2015. Most of these are worth under $5000 and would generally be considered consumer grade printers. The report reckons that 440,000 will sell in 2019. Usage of 3D printers can be seen in many spheres. It is used to print building blocks and human tissue but it is also used in Chinese Space program - Chinese astronauts were using 3D printed seats on their space flight. Each printed seat was tailored specially for that particular astronaut's unique size and shape. On the industrial front, China is now home to seven 3D printer manufacturers, including a consumer level model called the UP!. And, United States-based Stratasys (the largest 3D printer company in the world) employs about 150 employees in its Hong Kong office and plans to open an office in Beijing*.

*https://3dprint.com/109668/3d-printing-future-of-china/

On XHU, 3D technology is widely used on more than one faculty. It is integrated in different subjects and projects such are Student Business Club and Student Innovation Club. Since 3D technology includes knowledge from different disciplines, XHU's main vision realization - connecting students studying different majors in order to create mutual cooperation, can be seen here. Namely, 3D technology on XHU is part of very complex process which includes more than one major which means development of the product from basic sketch to the final production and commercialization. Complexity of the process requires great number of steps which means students and professors from the majors of Arts and Design and Computers and Software Engineering are required to realize the project. The final goal of the process is mass production and commercialization. XHU and it's professors from Product Design Faculty established cooperation with companies and factories so that student works can be commercialized and sold online after being produced. For the development of one product which is based on modern technology, several segments are needed. These segments are divided among students of different majors. The production process has the following steps: Product Design students develop an idea of the product and it's purpose. After that, they join forces with Fine Arts students in order to create model and prototype. Graphic Design students then create package and create advertising campaign for the product, while IT students develop software which is later being implemented in the product. The whole process merges in the 3D laboratory, where prototype is being built. This step helps students to see and overcome flaws and defects of the product before it is sent to mass production.

XHU 3D laboratory is equipped with MostFun Pro and WiiBoox One 3D printers and the professors who educate students in this field are mainly from United States.

3D technology on XHU is not opened only for students who study majors which include 3D. Since University supports student self-initiative and student ideas, 3D technology is available to all students who have an idea and are interesting in this technology. Student Business Center is a place which is open for all young entrepreneurs and visionaries whose ideas just started developing. The Center is supported by University itself but it is not guided by it. It is completely created and managed only by the students themselves. The only thing the University provides is space needed for running the Center and eventual advice if necessary . Since the Center is completely opened, students on XHU are developing ideas no matter what their major is with the help of 3D technology.

Success of this process can be seen in the example of bluetooth headphones created by students and supported by professors. These headphones were successfully created and commercialized and are now being sold online. This product was developed in 2016. as a part of semester project on the faculties mentioned above. As already mentioned, Product Design students developed an idea and purpose of this product, Fine Arts students gave visual look to the product, IT students created electronics and Graphic Design students created advertising campaign.

Xihua University is the indicator of omnipresence of 3D technology, it's benefits, simplicity and profitability. XHU students developed great number of products and different technologies but they also created number of connections with companies and factories. Process like this allows students to learn while they work and to position themselves on the market. Some of the products successfully created by students are:

-      Custom power banks,
-      Waterproof Bluetooth speakers
-      Custom made headphones (made by ear-model of customer),
-      Smart light bulb,
-      Smart coffee machine,
-      Flower pot-speakers

Further development of 3D technology in China

The fact that almost all Chinese Universities implemented 3D technology in their study programs is a proof that 3D technology is becoming a part of an everyday life in this country. Student projects are the best indicator of usefulness and efficiency of this technology. Chinese great commitment to product design makes 3D technology more and more popular. The best examples are student product design competitions where 3D Printing has maybe the most important roll. One of those competitions is being held on Xihua University. UIDC-SC (University Industrial Design Competition - Sichuan, China) is an event which gathers numerous design students from all over China. This competition is a great way to promote product design but also to popularize 3D technology. It is an opportunity for young authors, associates and professors to show their works and 3D technology enables them to show prototypes to the potential investors. Every year, several thousand prototypes find their investors and many products find their way to their buyers.

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