Usage of 3D printers in medical education

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3D modeling is the process of developing a mathematical representation of the surface of an object in three di-mensions with specialized software. The product is called a 3D model. This model can be physically created us-ing 3D printing devices. In 1981, Hideo Kodama of Nagoya Municipal Industrial Research Institute invented the methods for fabricat-ing three-dimensional plastic models with photo-hardening thermoset polymer. In 1984, Chuck Hull from 3D Sys-tems Corporation produced stereolithography fabrication system, in which layers were added by curing photo-polymers with ultraviolet light lasers. The developments in 3D printing gathered attention of engineering fields. The open patents and the use of cheap materials popularized it. It took place in education and production of cus-tom made prosthesis in medi-cine. 3D bio-printing consists of 3 stages. The first stage is the creation of a 3D model. The second stage is to convert the 3D object data into an STL file format, by approximating the contours of the 3D object with a series of tessellated triangles. Finally, the STL file is sent to a 3D printer for production. The detailed knowledge of human anatomy is im-portant for medical students and doctors of various departments, especially for those in surgical departments where technical skills are developed based on anatomical knowledge. In various studies, education with 3D products shows positive results. 3D products are relatively cheap, easier to store, scalable, dissectable, ethically unproblematic and able to show rare cases. Education with the use of 3D products is safe and tolerant in regard to mistakes. Also it gives an op-portunity for pushing the limits.

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