Technology Newsletter July 01, 2013 Issue 1

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We look at 3 D printing in education and industry. As a hobby a few years ago, 3D is poised for the next big thing.

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Edited for EDUC 6308-20
By David Lankford

3D Printing Earns An "A"

Schools from coast to coast are setting up 3 D printing labs as fast as the machine can be purchased. The new printer operates much like an ink jet printer; however, instead of ink the extruder shoots out hot plastic or metal. These "lines" cool to a solid quickly allowing the printer to bond layer upon layer until a three dimensional object is produced.

The buzz is not just in schools, NASA gave the 3D printer a big "A+" and decided to equip future space vehicles with one. NASA realized, probably after a re-run of Star Trek, that a 3D printer or "Replicator" would be ideal for mission critical parts replacements. If a gear breaks, you pull up a CAD drawing of the part and print a new **one.**

STEM and project based learning classes are challenging and rewarding for students. A 3 D Fab Lab will score even higher grades as our future space engineers look toward the future.

Microsoft Makes 3-D Printing As Simple As Clicking Print”

By Mark Wilson

Windows 8.1 will be the first OS to provide 3-D printers native support. What does that mean to you? The app market is poised for its first 3-D printing explosion.

Today, Microsoft announced a crucial step to empower the next wave of 3-D printer adoption. Windows 8.1 will be the first OS to support 3-D printing natively on desktops and tablets. “Our thinking was, let’s make this as easy as writing and printing a Word document,” says Shanen Boettcher, general manager at Microsoft’s Startup Business Group

Imagine if you could build an object in a game, then one-button print it in real life. In Windows 8.1, that’s not an unrealistic scenario. Shot taken from Minecraft.

“My kids have no problem building 3-D models in Minecraft all day long. How can you unlock 3-D creation for anybody to be able to do with a touch screen and their finger?” Boettcher asks. “To me that’s what’s really interesting.”

“I hope there’s a whole spectrum of apps. We might see a picture frame you just want to put your name on. Custom napkin rings for your dinner party. Maybe there’s a trophy app for your kid’s soccer teams. In the art world, maybe people will make a virtual potter’s wheel to create a 3-D object quickly and personalize it.”

Image: Printer via Shutterstock, Minecraft via Minecraft Gallery]

On one hand, the discrete apps could begin to add up in the somewhat obnoxious iOS fart-button way. On the other, 3-D printing could make Windows 8 app development more enticing than it’s been, and it’s a field so young that we could use more software Darwinism than less.

“My kids have no problem building 3-D models in Mindcraft”

Sparking Enthusiasm

Stratasys 3D Printing takes learning to new heights by capturing imaginations, testing ideas and proving theories in real space. Universities are using it to provide lifelike prototypes and durable custom lab equipment. High school students are taking their designs into space. And elementary schools are igniting a love for STEM education.

Ready for Workforce

Stratasy’s 3D Printers expose your students to the same technology they’ll encounter in their careers as engineers, designers and scientists. Proficiency in professional-grade 3D printing will give your students a competitive edge along with first-hand knowledge of technical concepts and development processes. Stratasys offers a powerful range of 3D printing capabilities, with PolyJet technology for multi-material 3D printing and impressively detailed surfaces, and FDM Technology for durable parts in production-grade thermoplastic. http://www.stratasys.com/en/industries/education/educators#sthash.eqh3bNzE.dpuf

Medical School Prints Gray's Anatomy

Professor Paul McMenamin, director of the Centre for Human Anatomy Education at the Monash University School of Biomedical Sciences, created the 3-D hand

with help from colleague Dr Colin McHenry and Michelle Quayle, a research assistant in Dr McHenry's laboratory.

They used CT scans from a dissected cadaver to give a 3-D printer the data it needed to build the model in successive layers of polymer powder, precisely fused into position by a laser. Bones have previously been printed in 3-D, but the team took the idea considerably further by including all the elements, from tendons to tissue.

Such models cannot entirely replace real specimens, but they go a long way towards counteracting the difficulties involved in using cadavers. They are likely to be especially welcome in hospitals and universities in remote areas or developing countries.

And if a hand can be produced, so can other parts. Cheap and quick to make, easy to obtain and maintain, free of legal or ethical requirements, and durable, artificial body parts such as this may revolutionize anatomy teaching.

http://www.monash.edu.au/monashmag/articles/issue4/3d-printing-extends-hand-to-science.html#.UdJDBL30fBI

MakerBot Education

3D Printing is one of the most disruptive technologies around, and MakerBots are changing the way we create and learn. These printers are affordable, personal fabrication tools, compact enough to sit on any desktop, and allow anyone at any skill level to become producers, inventors and artists. MakerBot Operators produce physical objects from strands of melted plastic filament, an activity described colloquially as makerbotting.

3D Printing is one of the most disruptive technologies

With MakerBots, students participate in project-based learning that is experiential in nature and has real-world applications. The process of designing, inventing and fabricating exposes students to various career paths such as industrial design and engineering, and allows them to directly engage with the tools used in those fields. MakerBotting engages students in the world around them, kindles a curiosity about how machines work, how objects fit together, and how the designers, architects, and inventors who build the products, spaces and technology in their lives have found solutions to a variety of design problems. Makerbotting has the potential to transform the way we think about Science, Technology, Engineering and Mathematics (STEM) education, and to inspire more young people to pursue STEM careers.

http://curriculum.makerbot.com/

3D Medicine

Engineers, technicians and doctors are collaborting to produce prosthetics of all shape and form. There are already CAD files of printed hands that rival Luke Skywalker's fictional hi tech hand. Global initiatives like plastic surgery parts inexpensively printed for refugees and the world's poor. Doing God's work with a printer. There is even a printer that prints with human cells to create replacement parts.