technology **today**

Alan Pierce
pierceaj@techtoday.us; follow on Twitter @TechToday_us

CES 2015—3D Printing Is Getting Hot

The Consumer Electronics Show (CES) is held each January in Las Vegas. When it comes to consumer electronics, CES is the place to go to see evolutionary, revolutionary, and/ place a 3D printer next to their current printer that they use to print documents and photographs.

Most of the 3D printers at CES 2015 were fused-filament fabrica-

Photo 1—A small part of the 2015 CES 3D Printing Tech Zone

or incremental technology advances. CES has been the incubator for many of my columns. (Getting a magazine through the printing and mailing process takes time, and that is why this CES-themed column, which was written in January, didn't reach your hands until March.)

The topics that I covered in past CES columns—wearable digital devices, controlling your home and life using the Internet, near field communication to unlock your world, the smart home, and smarter cars—were all front and center at this year's CES. One company even had a smart bandage that could provide feedback on temperature and other vital signs over the internet to you or your doctor.

At CES 2015, 3D printing blossomed from just a few vendors at last year's show into its own Tech Zone with an amazing array of new companies, machines, software, and other 3D support peripherals. (See Photo 1.) Could desktop 3D printing become the next breakaway consumer product? In my opinion, for this to happen the price of printers needs to fall to around $300 and tech-savvy kids need to pester their parents to

tion (FFF) machines. Most were being sold fully assembled, so after a quick unpacking of the machine and installation of the computer software you are ready to start building objects. I am basing this last statement on my experience using a Da Vinci 1.0, which is manufactured by XYZ Printing. The company sent me one for a product review and it was unbelievably easy to setup.

From my exploration into the world of 3D printing as a builder, it is clear that any tech-savvy 12-year-old could quickly start building 3D objects using the thousands of free designs already available for download on the Internet. (See Photo 2.) Online you can find STL files to build toys, jewelry, costumes, gadgets, miniatures of museum sculptures, cellphone cases, and any other plastic object that has already popped into someone's mind. The "easy-to-

use" statement above might not be true if the slicing/building software that comes with your machine is not as simple to use as the proprietary software that came with the Da Vinci 1.0. (See Photo 3.)

Online you will find many hobbyists who love this machine but hate the limitations that the easy-to-use software brings to the building process. They are sharing all kinds of changes to take full control of this machine's large building capacity and low price.

Building someone else's design does not provide the creative boost desired for the classroom. Autodesk *123D* is a family of free design software that you can download and use to design your own 3D projects or use it to personalize designs that you have downloaded from the Internet. Other companies also offer free software. 3D Systems, the company that originally invented 3D printing, has a $49.99 Cubify *Invent* program that their representative promised me is amazingly easy to use. They are sending me a copy for a review.
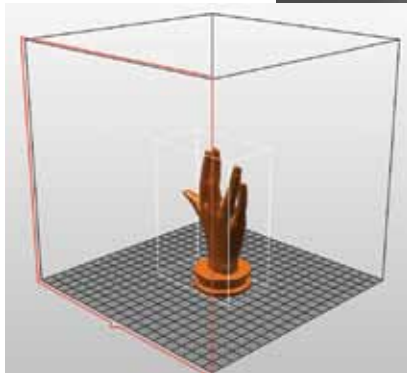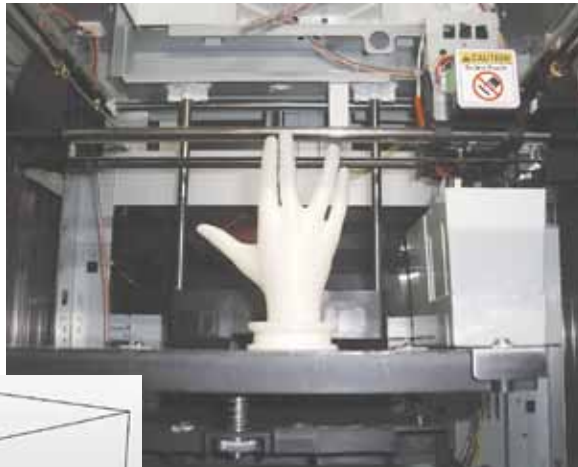
To further help you become an

Photo 2—I downloaded the STL files for the projects that I built from www.myminifactory.com.

effective designer, Microsoft has created netfabb, a free online service with an artificial intelligence (AI) engine that will automatically check any 3D design you upload, correct its

Alan Pierce, Ed.D., CSIT, is a technology education consultant. Visit www.technologytoday.us for past columns and teacher resources.

Photo 3—Finished 3D object printed on the Da Vinci 1.0. The drawing below shows how the object looked on my computer screen before I pressed the print button.

errors, and then download it back to you. By testing the designs you create yourself, or even the ones that you download from the Internet, you can almost guarantee a successful project build when you send it to your desktop 3D printer.

All FFF printers are basically built using the same parts found in an inkjet printer. These machines melt and push a plastic filament through a printing head, basically the same way an inkjet pushes ink. To create the third dimension, the print head and the print table incrementally move away from each other when the computer program indicates it is time to start printing the next layer.

The STL (stereo lithography) file format, developed by 3D Systems, is still the main file-saving program that 3D design programs and desktop printers use today. The full story of how 3D printing got started is fascinating; I covered it in my November 1998 column. It is amazing how this technology is now used in every area of technology, which was the subject of my September 2013 column. You can find links to these columns and all of my other past columns online at www.techtoday.us/Columns.

The XYZ Printing representative, who arranged for the company to send me a machine for a review, told me that the company's mission is to place thousands of 3D printers into average people's homes and start the next home printing revolution. At a CES 2015 presentation, Joris Peel warned the participants at his presentation that many of the 3D companies at CES this year are underfunded; they will be gone and their machines will not be supported by next year. This made me wonder if XYZ printing is financially secure and if their pricing, which is a third of what most other manufacturers charge for a printer, will soon put them out of business.

So I did some research. XYZ Printing is a subsidiary of the New Kinpo Group (NKG). NKG is the world's largest manufacturer of printers, wireless routers, hard disk drives, and TV set top boxes. They have manufactured products as the original equipment manufacturer (OEM) for Sony, Microsoft, Nikon, HP, Epson, Radio Shack, Sharp, Casio, Cannon, and many others.

They employ over 1,400 engineers, tasked to design new products for the consumer market. I would expect a company that has continually racked up sales of over $30 billion a year to stay in the 3D printer manufacturing game and constantly produce new 3D printing innovations. At CES 2015, XYZ Printing won a Home Top Tech Award for their 3D printer that prints edible cookies, cakes, and chocolate. They also won a CES 2015 Editors' Choice Award for their New Nobel 1 3D printer that uses a UV laser to fuse liquid resin into extremely fine 300-micron-layered 3D objects. They and some other companies are ready to move SLA 3D printing from an industrial process to a consumer desktop process.

By placing their own name on these machines and creating their own brand, they can afford to sell their machines at a much lower price than the competition. They will force the competition to lower their prices and, in my opinion, this will cause desktop 3D printing to become a hot consumer market. My review of the Da Vinci 1, the Matter and Form 3D scanner, and the software mentioned in this column can be found online at www.technologytoday.us/Product Reviews.

Recalling the Facts

1. If your parents purchased a 3D printer for your home, what is the first project you would want to design and build yourself?

2. Research: What is the difference between FFF 3D fabrication and SLA 3D fabrication? Which one produces higher quality projects? Ⓣ