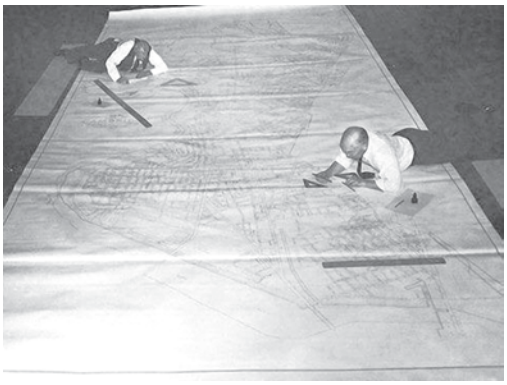
Doodling's Evolution and Drafting in the 21st Century

By Anna Gudde

ARE you a doodler? Perhaps you fill the margins of your notebook with sketches and drawings. Or maybe you draw on napkins or scrap paper to pass the time. At some point, we're probably all doodlers.

Ever wonder if your sketches could come to life? With a few added dimensions and a dash of technology, they could.

Doodling, or drawing, has been around a long time. From early cave drawings to design software such as AutoCAD and SolidWorks, we can safely assume that since we've had an instrument in our hands, we've been sketching plans and technical drawings, and doodling ideas.



Engineers designing aircraft wings on huge sheets of paper.

Teaching students to use traditional drafting tools such as these can help them communicate their ideas.

The History of Drafting

Let's take a closer look at drafting and its rise from an under-the-radar part of the process to a highly developed skill set.

- Early drafting tools—Before computers and computer-aided design (CAD) programs, architects, draftspeople, and engineers used pencils, paper, rulers, bow compasses, and the like to sketch out their ideas. Nowadays, most "sketching" is done on the computer. But these early tools are far from obsolete. While there are definite benefits to using CAD programs, knowing how to draw to scale and how to write neatly in specs are still valuable skills in the drafting world.
- 1960s—Sketchpad, created by Ivan Sutherland in 1963, was the first CAD-type program. It ran on the Lincoln TX-2 and enabled users to create drawings on the computer. Sketchpad ushered in the modern age of engineering and made way for the various CAD programs in use today.
- 1970s—Initially, aerospace and manufacturing companies were the only users of Sutherland's program. Eventually, though, CAD programs that worked on smaller computers were introduced to the industry. After design engineers tackled the learning curve of using CAD, their efficiency and productivity went through the roof. Over time, CAD software became affordable and more user-friendly, and its popularity grew.
- 1980s-1990s—AutoCAD—still widely used today—was introduced in 1982. CAD software was then developed further to include 3-D features, and suddenly the technical drawings of the past became increasingly lifelike and easy to engineer.

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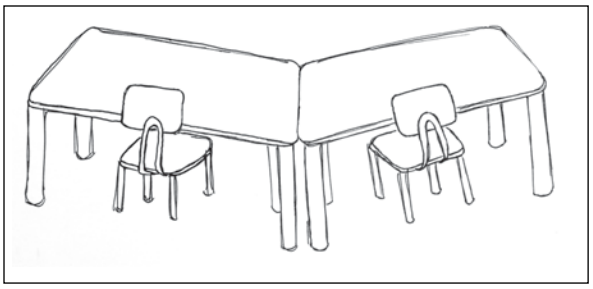
● Present—The evolution of drafting has brought us to the present day, where using 3-D models is the norm and the trend to create full virtual prototypes is hot. Soon, we might not notice the difference between a virtual 3-D object and a real object—crazy, isn't it? Who would have thought the evolution of drafting was so high-tech?



Before computers and CAD programs, architects, draftspeople, and engineers used pencils, and paper to sketch out their ideas.

Today, 3-D models are the norm and the trend is to create full virtual prototypes.

Drafting and Design in Today's Classroom

Thanks to the ideas, designs, and brilliance of past artists and inventors, today's drafting and design students can use previous and modern technology to become anything from architects, carpenters, and general contractors to materials engineers, planners/designers, roofers, and much more.

So, what does that mean for today's drafting or engineering classroom? What can teachers do to prepare students for the high-tech world of drafting and design?

Building toothpick bridges gives students hands-on skills.

For starters, instructors can go back to the basics. Because while the majority of universities and careers are using CAD, students still need to demonstrate an ability to draw to spec, to measure and scale drawings up or down as needed, and to communicate their ideas on the fly, especially if they're working as contractors or contracting supervisors. As Pittsburg State University's Dr. Andrew Klenke, associate professor of technology and engineering education, explains, "When you get on the job floor, you aren't able to say, 'Well, where's my computer?' No, they grab a piece of paper towel or whatever and they start sketching it out, saying, 'This needs to move over,' and 'Drill this hole. . . .'"

There are several ways to give students the necessary hands-on skills. Introducing them to T squares, bow compasses, and other drafting tools is one. Actual hands-on building is another. Instructors can teach a class on bridges and bridge building and have students use toothpicks and glue to build toothpick bridges. Or give the class balsa wood and challenge students to create the strongest trusses possible. Kits such as Pitsco's True Scale House Framing Kit make the building easy and fun for both the teacher and the students. Older or more advanced students could work together to build a doghouse or even a storage shed.

Beyond hands-on skills, students need to have an awareness of the career opportunities available and the skills, both technical and soft skills, necessary to be successful in their chosen field. Having students explore O*NET OnLine is a great way to introduce them to the various drafting and design careers. An assignment to research a sample career and write a report on the skills and training required, what type of salary to expect, and whether the student thinks this career would be a good fit will help students gain a fuller understanding of what the drafting and design workforce entails.

The world of drafting has come a long way in a relatively short span of time. But today's students have a wealth of opportunities available to them. It's exciting to think about what's on the horizon.

Further your drafting exploration with these sources:

Examining the History of Engineering Drafting and Design
http://blogs.autodesk.com/inventor/2016/12/20/examining-the-history-of-engineering-drafting-and-design

Sketchpad of Ivan Sutherland
http://history-computer.com/ModernComputer/Software/Sketchpad.html

Computer-Aided Drafting & Design History
https://www.techwalla.com/articles/computer-aided-drafting-design-history

O*NET OnLine
https://www.onetonline.org