Industry-Backed Competitions: Helping Today’s Students Prepare for Tomorrow’s Careers

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Autodesk’s Design for Industry program recruits students to envision creative technical solutions that support industry’s needs through the use of professional design tools.

Although nearly 3.5 million manufacturing jobs will likely be needed over the next decade, 2 million are expected to go unfilled due to the impending skills gap, according to a recent analysis of US Bureau of Labor Statistics data. Further, more than one out of five employers feel that academic institutions aren’t adequately preparing students to fill the roles their organizations need, according to a recent CareerBuilder survey. To help close the skills gap in STEM (science, technology, engineering, and math) fields, student challenges and competitions are increasingly promoted as a promising way for the next generation to refine skills, bolster portfolios, connect with other learners, and gain exposure to industry professionals—all outside of traditional education frameworks. Autodesk—a company that makes software for people who make things—has long focused on equipping the next generation of engineers, designers, and architects with real-life design skills necessary for future careers. One way we reach students and educators is through the Autodesk Design Academy (academy.autodesk.com), a free, online learning collection of lessons, projects, curriculum support materials, and student profiles that helps educators introduce students to the world of design. Autodesk Design Academy has more than 100 academic standards-aligned curriculum projects for educators, as well as 24 self-paced educational courses in which more than 60,000 students have enrolled.

In 2016, Autodesk launched the Design for Industry program, a series of unique student challenges that target key industries (www.autodesk.com/designforindustry). The program helps participants gain access to learning content and software resources to build their proficiency through the use of professional tools, including Autodesk Fusion 360 (www.autodesk.com/products/fusion-360). Fusion 360 is the first cloud-based CAD/CAM solution. The software
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offers everything a designer or manufacturer needs to go from concept to fabrication in one package: parametric, freeform, and direct modeling; mechanical engineering; data management; collaboration; drawings; visualization; simulation; machining; and additive manufacturing.

Each Design for Industry challenge centers on a different theme as defined by industry professionals. Designs are solicited to help solve real-world challenges related to space, health, sports, home and office design, wearable technology, and more. Top industry professionals evaluate the submitted designs, with consideration for their real-life application and criteria such as innovation and inventiveness, software skills, suitability to purpose, and creativity.

To participate, students aged 13 to 24 submit a rendering of their 3D model and a short written description of their design. Some students also choose to submit annotated drawings, marketing materials, or links to YouTube videos that help showcase the design intent. Entries for each Design for Industry challenge are publicly viewable on the challenge website. Autodesk incentivizes early submissions by offering a special award for best early entry.

Participants vote for their favorite entries. Experienced industry professionals act as judges for each challenge; they include representatives from organizations ranging from NASA to Mercedes-Benz. The judges use the participant votes as the basis for picking finalists, and the winners (8 to 12 per competition) are decided by the industry partners who defined the challenge criteria. The judging process typically takes less than one month. The winners are then given an opportunity to meet one-on-one with the industry professionals who evaluated their work. With student entries from all over the world, these mentoring sessions are typically held over Skype, although industry experts also engage students through webinars, videos, and so on. Just as students connect with their peers and industry professionals, the Design for Industry framework also links these professionals to the future labor force.

By encouraging students from 70 countries to participate in challenges against their peers for access to industry professionals and cash prizes, Autodesk expects to help students understand the critical skills they will need to transition successfully to future careers.

The first Design for Industry Challenge was “Design for Space.” Students submitted design concepts for a tiny Cube Satellite that had a mission to attach to, secure, and deorbit the Vanguard 1, an ailing 1950s satellite. The participants had to submit a cube satellite design, rendering, and description explaining how their cube satellite functioned once launched into orbit. The judging panel for this challenge included NASA astronaut FIGURE 1. Rendering of CubZ, the first-place winner in the Design for Space challenge, submitted by Sharath Nia from India. (Photo used with permission.)

FIGURE 2. Winning CubZ design. (Photo used with permission.)
Yvonne Cagle; California Polytechnic State University, San Luis Obispo engineering professor and co-inventor of the CubeSat standard, Jordi Puig-Suari; and Field Ready principle designer and cofounder Dara Dotz.

In addition to the cash prize, winners regularly state that the opportunity to receive the judges’ actionable feedback was the most rewarding component of the challenge. Design for Space’s top winner, Sharath Niak from India, was paired with Cagle for her industry expert debrief and afterward exclaimed that, “It was the best day of my life!” Sharath’s design, the CubZ, employed four folding mechanical arms with adhesive tips to locate and attach to the Vanguard 1 (see Figures 1 and 2).

Another Design for Industry challenge was the Design for Home and Office initiative, which invited students to design their ideal personal workspace. The directors of design at Steelcase and Coalesse received and evaluated thousands of entries, ranging from fully articulated folding desks to immersive, egg-shaped pods.

The initial Design for Industry challenges have supported students in the engineering and industrial design fields, but as the program continues, the scope will broaden to include additional disciplines in postsecondary and secondary education.

Developing their skills in the next-generation tools used by professionals makes students stand out and hirable. Challenges such as Design for Industry address the current skills gap by getting today’s students excited about STEM’s possibilities while they develop strong design skills and portfolios that reflect real-life scenarios.

REFERENCES