



Extending Design Learning Beyond the CAD Lab with Onshape



University of Colorado **Boulder**

The Integrated Teaching and Learning (ITL) Lab at the University of Colorado Boulder has found Onshape to be an instrumental resource for students learning the fundamentals of engineering design through CAD – especially for group design projects. Onshape allows students to easily share files, collaborate in real-time, and use a CAD system accessible to everyone in their group, in and out of the lab.

Supporting Diverse Needs & Programs

The ITL Lab provides workshops, advisements, and technology tools for roughly 6,000 engineering students across multiple programs in the engineering college including mechanical, aerospace, electrical, civil and architectural engineering, just to name a few. Approximately 300 students a day leverage these resources, coming from first-year design courses, experimental hands-on learning courses, design project teams and design expos. The purpose of the ITL Lab is to support students and faculty to help them reach their coursework and research goals by facilitating hands-on learning experiences, providing an experimental environment, and fostering a culture of innovation.

Mo Woods, a Product Design and Instrumentation Engineer at the University, runs various design workshops in the ITL Lab and delivers guest lectures for courses that involve group design projects, putting him in front of students with a diverse range of engineering interests and project requirements.

On top of supporting multiple engineering disciplines, Woods has only a short window of time to work with the students who come to his lab. He has one lecture or elective workshop to get students working comfortably in a CAD system, typically for the first time. And as a group project advisor, it is important for him to be able to easily reach any student that needs assistance.



Mo Woods

Product Design & Instrumentation Engineer

Onshape Makes it Easy

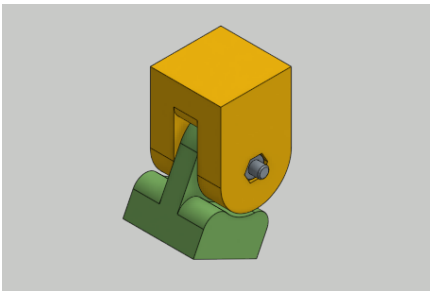
As a cloud-based CAD solution, Onshape provides solutions for some of Woods' biggest challenges. "The ease of being able to log in and just be there, on WIFI or on whatever, is huge. It turns it into the Google Drive of CAD." With such a short window of time to work with the students, every minute counts. And because Onshape is accessible from any device at any time, Woods' reach can extend beyond the lab, as students can get to work instantly, wherever they are and on a variety of devices.

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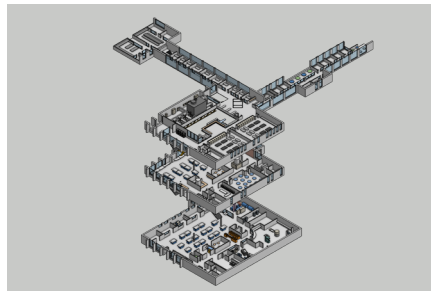
- Mo Woods

In a different ITL program, Woods says they spend a good 15-20 minutes each time they employ a new software – mostly debugging computers. And with traditional CAD programs, precious class time is often spent waiting for programs to load, recovering lost files after a crash, or just learning to navigate a complicated interface.

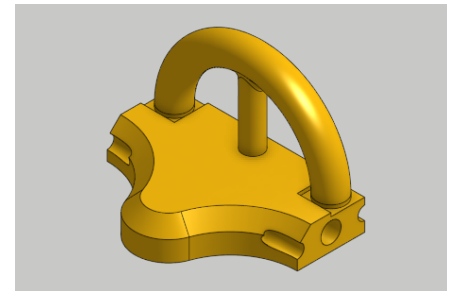
But in the Onshape workshop, Woods and his students have been able to shed that extra weight because they can jump right into the tool and start working immediately. "There's no need to teach the file structure and the dashboard and all that stuff. Students just know what to do." For Woods, this means he has more time to teach. "All of that [saved] time leads to people having face-to-face time to talk to me and ask questions as they're learning this new tool," according to Woods. "I wouldn't trade it for anything!"



Onshape joint model used by Woods in ITL workshops



A layout at the ITL Laboratory created in Onshape



A model for homework exercises used by students in the ITL Lab

CAD as a Tool to Support Design Learning

Woods is a strong believer in using Onshape to educate future engineers. "It comes down to this idea of accessibility and equity: who can we teach it to, how can we teach it?" Woods says. "Onshape is the same as any other legitimate CAD program. That really breeds this plasticity and flexibility to sit down in front of any [CAD] software and feel good about it, because Onshape taught you everything you need to know."

Despite working with students of all experience levels, who come from various engineering fields, and work on a range of devices, Woods is able to reach them all in a meaningful way. When students leave his workshops, they have learned about the design process and how to take intuition and put it into their design through CAD. As Woods proclaims, "CAD shouldn't be the hard part, design should be the hard part." Onshape shows students that CAD is an intelligent tool for today's modern engineer solving tomorrow's problems.

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