Virginia Tech Enhances 3D Printing Program with the Help of GrabCAD Shop

Scott Patrick is the Senior Mechanical designer for Virginia Tech's Aerospace and Ocean Engineering (AOE) machine lab. Today, this particular print lab does everything from traditional machining and welding to rapid prototyping by way of additive manufacturing.

The lab — under Scott and his assistant's care — even completes research projects for students and local research teams.

"We're 3D printing designs for actual labs on a daily basis," Scott says.

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>
> Scott Patrick
> **Senior Mechanical Designer for Virginia Tech's Aerospace and Ocean Engineering Machine Lab**

VIRGINIA TECH

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Case Study

The AOE lab wasn't always this capable. Back in 2009 when Scott first started, it was strictly a machine lab. During that time the lab was far more basic in it's functionality — and it was only a year later when the lab started acquiring 3D printers.

At this time, Virginia Tech wanted to explore additive manufacturing so that their students could learn this new technology and increase their skills. Their first 3D printer was an Objet30, a relatively small but powerful desktop printer.

As demand for 3D prints increased, the need for 3D printers became apparent. Gradually, the school started purchasing more 3D printers and by 2014, Scott's AOE lab contained a multicolored Connex3, a Objet500, a FDM Fortus360, and a Uprint.

The lab had grown to accommodate the greater demand for 3D prints and was more advanced than ever before. This positive shift, however, only made Scott's job more time-consuming.

The temporary solution was GrabCAD Workbench, a CAD collaboration solution that makes it easy for students to work together and manage projects.

Every day — often multiple times a day — Scott would have to walk a quarter of a mile between buildings, carrying a thumb drive that contained all his students' CAD files.

New Technologies and New Troubles

"The GrabCAD Workbench platform came about and it worked well for us," Scott explains. "It had a lot of limitations, but it allowed us to handle students on a project-by-project basis."

Even with GrabCAD Workbench, Scott still needed a better solution that would help him manage students' projects and reduce the time he was wasting sorting through emails and communicating with students.

With all of those respective students sending him their jobs, Scott's email inbox would be completely flooded. With each project, he would have to communicate back and forth with each student if there were any issues concerning their parts.

To make things even more challenging, the 3D printers and print lab were in separate buildings. So every day — often multiple times a day — Scott would have to walk a quarter of a mile between buildings, carrying a thumb drive that contained all his students' CAD files.

"Those were rough years," Scott says; and unfortunately, things only became more difficult when the pandemic started.

"Once we hit COVID era, our department had to make changes to save money. So we turned our services over to a fee-based process for getting 3D prints."

Now, Scott not only needed a solution that would provide better communication with students, but he also needed a tool that could track material usage and machine costs — not to mention a way to quote students requesting a part.

"This led us down the path of inquiring about GrabCAD Shop."

Shifting Towards Shop

As soon as Virginia Tech started using GrabCAD Shop, it completely changed the way Scott and his students were operating.

"It's now reduced my workload by 30-40%," Scott exclaims.

Instead of having to waste his time sorting through emails and walking back and forth between buildings, he can now operate his lab remotely; he can now address any job issues from his students right in the project order, while his lab operator assistant schedules the print jobs as they come.

GrabCAD Shop with its organizational capabilities has been able to bridge the gap between traditional manufacturing and additive manufacturing. Whatever job that the lab receives that cannot be traditionally machined, Scott and his assistant are able to categorize and send it to the printer to be completed.

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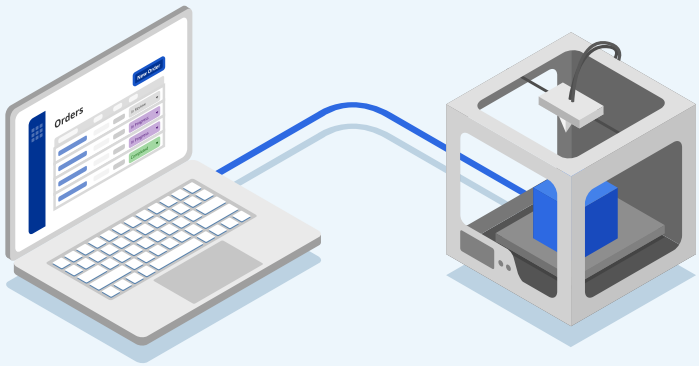
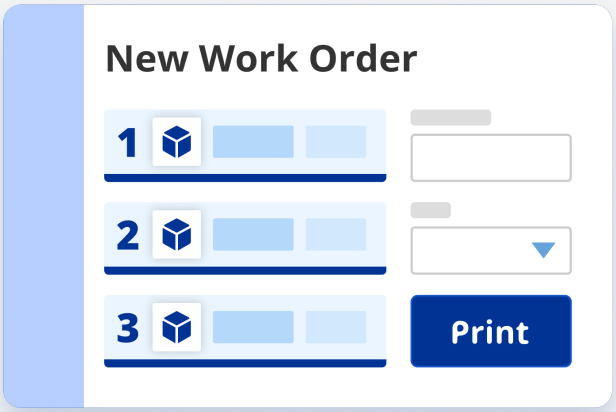




Using GrabCAD Shop, all incoming jobs are now completed in a timely manner whether it be from his students who submit parts to be graded by their respective faculty members, or from the schools research team that creates prototypes that need to be tested.

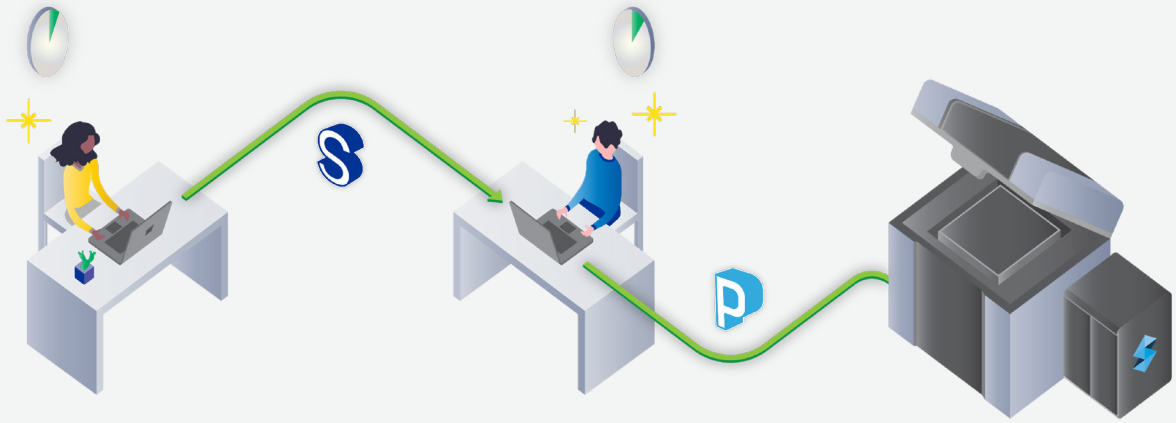
These prototypes include things like aircraft structures and props for miniature aircrafts that are tested in the school's wind tunnel testing facilities.

In addition, students are now given more exposure to 3D printing within their engineering curriculum through Scott and his experience within the field and through using GrabCAD Shop.

"It's been very easy to communicate with the students on the platform." Scott continues, "GrabCAD Shop reaches beyond the communication capabilities that Workbench has."

Since the students are able to comment in a single place and Scott can easily see the comments, response times are at its fastest yet.

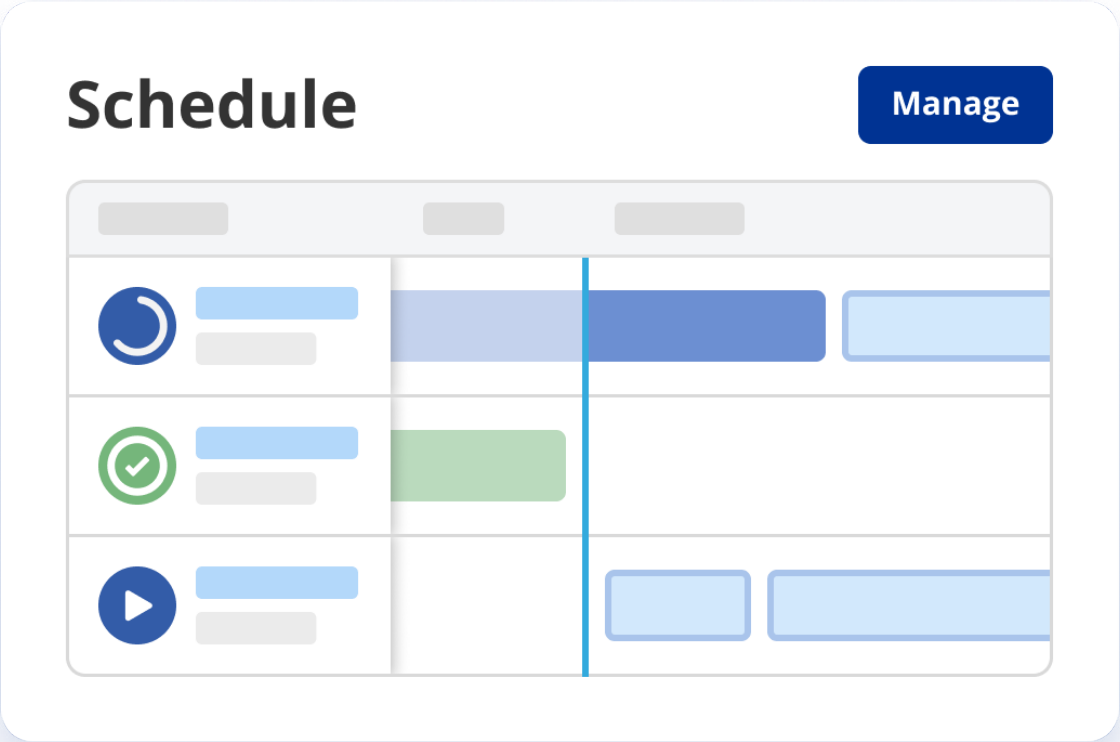
"We weren't interfacing with any students regarding 3D printing before. They would bring incomplete designs. But now we have the capabilities to build a prototype to evaluate by way of 3D printing."



In Conclusion

GrabCAD Shop has allowed Scott to run his AOE lab at its best capacity yet. His students can easily communicate on assignments so that they can be completed. Not to mention, even in the face of COVID-19 and the unique problems that come with that, the school can account for all their material and usage costs.

“It’s awesome. I love my job! I get to use CAD all day and use 3D printers.”



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