

Hoover High Case Study

Mark Conner, Engineering Teacher at Hoover High, used SolidProfessor in the classroom, to train teachers, and eventually launch an online engineering academy, Catapult Engineering Academy, to make their resources available to students everywhere.

College Prep Curriculum at Hoover High

“We had the opportunity to create a four-year engineering program, basically with a blank canvas. In 2003, we looked at existing curriculum options but we didn’t see anything that fit what we wanted for our demographics, which is heavy college prep. So, we opted to create our own four year curriculum and model it after the first two years of undergraduate college engineering. Our students typically come in the 9th grade and go through the four-year engineering sequence, so they are truly prepared when they go to college.

“What we found is that 3D solid modeling, specifically using SOLIDWORKS, is a great entry point for our students. Many of them are taking geometry concurrently, so there is a good tie to some of the math they are doing. We can talk about things like the engineering design process in the context of doing the solid modeling.

“What SolidProfessor has allowed us to do is teach much more efficiently. Anyone who has tried to stand up and teach anything in a computer lab to more than two people has experienced the frustration with that dynamic. When they have a monitor in front of them, students tend to not listen well. **SolidProfessor gives us the ability to let the students, to some degree, work at their own pace.** We still set milestones, but they have the ability to use those videos in a way that works with their particular learning style. They can go back and listen again, pause and keep going. So SolidProfessor has really opened up what we can do and it has also **set our teachers free to focus more on one on one mentoring roles instead of trying to maintain focus from a group of 20-25 students** as they teach from the front.”

“**I’ve given up on textbooks** for what we teach at the high school level because they are incredibly watered down or are aimed at younger graduate students. While we are teaching a lot of content that is consistent with the undergraduate courses, it has to be presented in a way that is appropriate for 9th, 10th, 11th grade students. So we gave up on textbooks years ago and our options were to create our own software, which is daunting on a number of fronts, or go with SolidProfessor. When we looked at SolidProfessor, it was everything we were looking for. **The videos are pared down to less than 5 or 6 minutes. They are very well done, they are easy to follow.**

“**The baseline skill set for all of our students has moved up** because they can access the material repeatedly. One of the frustrations, I think, in a traditional lab type setting is that you go through something one time, and if they don’t pick it up, it is really hard to go back through it in a way that keeps people engaged. SolidProfessor allows the students to go back, work at their

pace, and pick up that one piece that they didn't really understand. Then, for those students who are just go-getters, **SolidProfessor gives them the ability to go to another level** without monopolizing the teacher and without penalizing other students. They are able to get creative and **venture into new territory**, just using some of the tools that are available through SolidProfessor. They go into areas where even we teachers do not have expertise or knowledge. We found that a lot of times if students feel like they have an opportunity to learn something that the teacher doesn't know, then that is a challenge they want to accept. It makes for a good dynamic with those advanced students.

Helping Teachers Help Students

In addition to helping Hoover High School students, SolidProfessor has also helped the teachers at Hoover High. Many teachers aren't experts in the software, and they need some help. They don't want to spend all of their time focusing on the "pics and clicks" of the software, they want to be teaching an entire design process.

"Anything that gives teachers the ability to educate themselves and to have a resource that is readily available is huge, because time is an issue. We actually made the move to SOLIDWORKS because of SolidProfessor. We had no SOLIDWORKS experience on our faculty; we are all engineers from different disciplines. Our experience was in other modeling packages, but **we were able to make the move to SOLIDWORKS, cold, essentially, because we have access to the videos ourselves and work ahead of the students.** The teacher has the same options their students do. They can go as deep as they want on a particular topic, so they don't have to be the expert on day one. They can chose to become an expert as they go through or they can have baseline knowledge and know where to point students when they want to go deeper with something.

Looking Forward: An Online Engineering Academy

"When we started our model at Hoover, we started it with the mindset that we wanted to replicate it at other schools. And what we realized early on was that the number one barrier to replicating the program wasn't technology, it wasn't finances, it was faculty. We were in a really unique position where we were able to hire engineers every time we needed another faculty member. So all of our faculty members were degreed engineers who have chosen high school teaching as their current career. And that is not something that is easily replicated. It is hard for school to just be able to find engineers and hire them and it can be a huge expense. So we focused on our own program until the idea to put some things online came up, and as I did more research there, I realized that the online platform is our ability to replicate. What I realized was that **we can take what we are doing at Hoover and make that available to students everywhere.** Whether it is in groups of students in the classroom at another school, or individual students who are homeschooled, or students working on their own. So our goal is to

do everything we do at Hoover, online. There are obviously some elements of just that teacher-student dynamic and that group dynamic that happens in a classroom that can't be replicated online. But as far as the content goes, there is a whole lot that we can do with students in an online environment. There has to be something in the way of video screening and SolidProfessor was a no brainer on that front. **Everything it was doing for us at Hoover, it could do online.** It made the ability to go from no online content for that course to significant online content in a short period of time.

Partnering with SolidProfessor

"With SolidProfessor, **I don't feel like a customer, I feel like a partner.** I enjoy the relationship with you where we can bounce ideas back and forth and things aren't ruled out. If a new idea comes up, we can put it on the table. As we come up with an idea, we can share it with you. And as you come up with new approaches and new content, we can look way to incorporate that in what we are doing. It feels more like **we are collaborating.**"