



What good is a design that you can't build? Student gives Lesson in Design for Manufacturing

"What good is a design that you can't build? That's where North American manufacturing has gone wrong," says Ben Hovorka, recent graduate from Ferris State University. Before you dismiss his comments as youthful excess, consider his background.

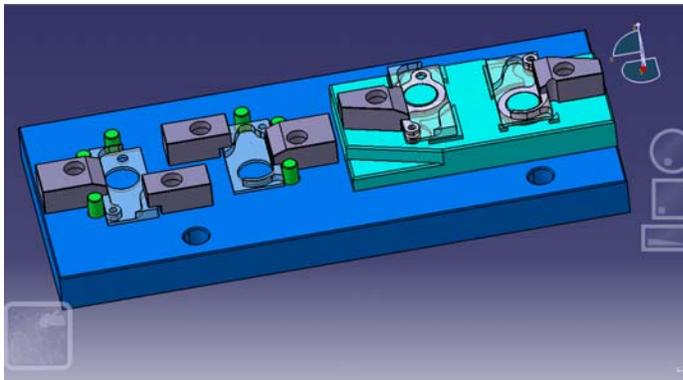
Ben has worked on the factory floor during internships and in machine shops. And after 3 years of studying Product Design Engineering at Grand Valley State University, Ben switched schools to finish his degree in Manufacturing Engineering Technology at Ferris State University. In his final year (2009) he presented his work at the CATIA Operator's Exchange Conference in Seattle where he won first prize in the Poster Competition. He may be young, but don't dismiss his insights.



Ben points out that proper design for manufacturing can:

- Improve quality by avoiding poor processes
- Reduce costs by using standardized tooling or reducing waste
- Significantly reduce manufacturing time by optimizing tool-paths

How does he know? David Bork, Ben's professor at Ferris State assigned a project to manufacture a



pair of scissors from bar stock. They were given the CAD file in CATIA V5 and told to design a manufacturing process and then make the scissors. This image shows the fixture that Ben designed. After simulating the tool paths, the students actually built their scissors in the school's machine shop. This lesson demonstrated the importance of

designing for manufacturing. The students found out that their costs could go down substantially if they designed for less waste and for more efficient tool paths with fewer tools.

Ferris State uses CATIA V5 and DELMIA to give students an integrated package for testing the manufacturability of their designs. Ben points out that this powerful combination allows him to work at an assembly level, detecting possible collisions or other issues with his manufacturing fixtures and processes. Where problems arise, he can simply open up and adjust the design of the conflicting parts without having to dig deep in the application's menu structure. Even more powerful, he can rebuild the tool path without having to start over. This cuts the manufacturing process design time by more than half.

He contrasts his experience with CATIA V5 to learning to use the Pro/ENGINEER suite of tools from Parametric Technologies at Ferris State University, before the Manufacturing department switched over to CATIA V5. He noticed a fundamental disconnect that exists within many CAD tools that don't connect to a manufacturing application natively. Ben believes that if all design engineers had experience with a similar manufacturing project, there wouldn't be so many cost and quality challenges in American manufacturing.

As Ben said,

"No other CAD package has the seamless manufacturing integration of CATIA V5 with DELMIA. Competitive CAD packages use 3rd party CAM add-ons that force you to recreate the tool paths for each revision to the part geometry. CATIA's tight integration does away with this non-value added activity by updating tool paths automatically."

