Rapid prototyping technologies and creative thinking throughout the design process.

This presentation addresses the impact of rapid prototyping technologies on the learning processes of design students and is intended for interior designers, educators, and students. Prototyping is an essential phase of product development to assess function, form, and material applications. For many years, prototyping has been a skill that has been painstakingly created by hand with added cost and time to production cycles. In recent years, the use of CNC machined (computer numerical control) prototypes has shown that multiple iterations and optimized material use can be explored before the final costly phase of fabrication. This process involves converting computer-generated designs into physical objects through rapid prototyping technologies.

This study explores where in the design process; concept development, schematic design, design development, rapid prototyping is used. Students were engaged for 6-weeks designing and fabricating 2 furniture pieces constructed from one sheet of plywood. Criteria for the project was to create 2 designs in CAD software that could be CNC manufactured and flat-pack shipped, have the ability to be constructed with no tools or hardware, and minimize material waste. Students produced a number of scale models prior to full-scale fabrication.

The evaluation criteria for each prototype were based on the optimization of form, function, and material application. Results of the study indicate that the ability to rapidly produce three-dimensional representations of designs impacts levels of creative thinking of form, function, and material application. This presentation will discuss rapid prototyping and how it was shown to enhance creative thinking in student design processes.