Razor Design:

Integrating Individual Design Skills into the Project Process

by Robert Brainard, IDSA

The greatest thrill in teaching the creative discipline of industrial design is to see student designers put it all together and integrate their skills with the outcome of a great product. This particular article tracks just such an experience—a design project in collaboration with Schick Corporation.

While teaching at the University of Bridgeport, my focus was teaching computer modeling and integrating it with the junior level Industrial Design Studios. The personal measure of success was the integration of all the design skills into the design process. This involved not just teaching the fundamental modeling tools, but getting the students to use it regularly just as they would their sketching skills and model making skills. This was typically done in a number of stages—(1) teaching **form•Z** as a series of tutorials, (2) teaching advanced modeling skills, (3) requiring the use of computer models to illustrate the proposed designs of the various design studio courses – basically to integrate computer modeling with the design process as you would with any other design skill or tool. This integration is what is necessary in the professional world in order to efficiently move the design forward.

This advanced integration of design skills with the design process is what I see as the goal of the junior year Industrial Design program. The first two years of undergraduate education are developmental in nature giving the students the initial and necessary skills to start designing products. The junior year is the integration of these skills into the design process to develop unique and usable products that solve real user needs. Typically we would have a series of short problems in the fall semester to make sure that students are up to speed and to advance their skills. Then we would tackle a larger scale design problem in the spring semester that would encompass multiple facets and all the design skills the students had developed to that point.

In this project students had the opportunity to choose to focus their design on a men's or women's razor and either a refillable or disposable razor. The goal was to not just design a razor, but to develop concepts through sketches, prove them through foam study models, refine the concept through computer models, and finally generate SLA models which was done through the generous assistance of Model Vision in New Milford, CT.

In this project the process involved analyzing the user needs through observation and photography and therefore drawing ergonomic conclusions. Developing concept directions through sketch development and modeling those in both foam models and in 3D computer models. This development ultimately resulted in SLA models that

Figures 1a-b: Ergonomic analysis of existing razors by Joel Miller.

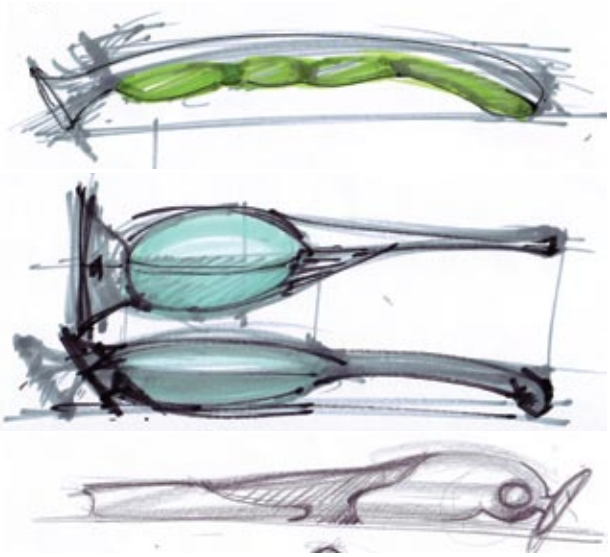

Figure 2: Sketch concepts by Joel Miller.

Figure 3: Foam study models by William Gaston — showing the progression for economizing materials and improving the grip.

were used for the final evaluation. While the students had a variety of programs at their disposal (**form•Z**, SolidWorks, Maya, Google SketchUp)—and some students used SolidWorks for the refinement stages because of the feature history—there were many distinct advantages that were discovered for using **form•Z**. They were: better 3D paths, great 3D sketching, ability to quickly develop concept variations, and superior rendering of images.

The process that we used was to define the design before finalizing the computer model so that the model was defined by the desired user configuration rather than the design being defined by the students' limited ability to create a computer model that is reflective of solving the user needs.

The goal is to have the students design a razor and create a computer model to reflect that design. The computer model must be driven by the desired design, rather than the design being a result of the student's computer modeling limitations. This makes for a great exercise to fine tune the computer modeling skills—rather than have the design driven by the student's limitations of computer modeling. It is a great intermediate / advanced exercise. The students enjoy it because it helps to further progress their computer modeling skills and also helps them to understand how computer modeling fits into the design process.

Figure 4: Final image series of computer models by William Gaston.

Robert Brainard taught in the design department of the University of Bridgeport from 1997 to 2008. His students won the **form•Z** Joint Study Award of Distinction in 1999, 2003, and 2005 as well as honorable mentions in 1999, and 2005. His students have also won national and international competitions by IDSA, Lightolier, The Library of Congress, Samsung, National Housewares, and LG Electronics among others. He was educated at the University of Cincinnati in industrial design and has a career involved in consulting with start-up companies on up to multinational corporations. His work has involved groundbreaking research and resulted in numerous US and international patents. He has run his own consulting firm since 1992 having previously worked for consulting firms and corporate offices.