

A Fertile Ground for Education

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Quick visualization tool is a requirement of today's competitive environment



FIGURE 1
"Gears"

TAKANORI OHSHIMA



FIGURE 2
"Gear Assembly"

Typically, entering Tama Art University students are thoroughly screened and the entry ratio to applicants in Product Design is very low. This usually translates into highly motivated students with a high level of graphic skills. Some have spent an extra one or two years preparing to just enter. The reason for the competitive entry process is that the department is traditionally rated among the leaders in Product Design education in Japan. Graduating students typically take jobs with major design firms here. Therefore the need for quick visualization tools is a requirement of today's competitive environment. As one can imagine these students provide a fertile ground for education.

The overview of the computer graphics curriculum consists of two courses designed to give a basis of computer graphic literacy, beginning in the first year and continuing through the second year. The first year is primarily geared toward two-dimensional graphics, giving the students basic presentation skills, while the second focuses on three-dimensional graphics, with occasional experiments in animation. Both of these classes are intended to offer support to the design studio and at times projects from the studio are used in either of these classes. This arrangement presents some difficulties in the timing of the class projects. Because the graphics in the computer class are often undertaken after the main design decisions have already been made, computer graphics are used primarily as presentation tools. Also, the initial development of the students' computer skills impedes these graphic tools from being used immediately in the design visualization process, but typically by mid year they are ready to tackle some more complex projects.

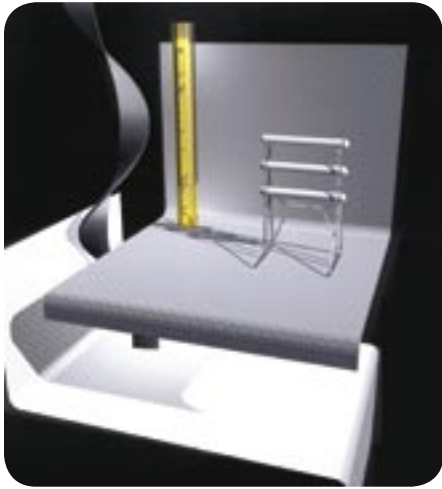
Since 2002, one Macintosh is available per student, for a class size of about 35 students. The class meets an hour and a half once a week for 27 classes. The multiple language feature of **form-Z** has really helped our students. Without a Japanese version it would have been a lot more difficult to teach this class.

The 3D course is an aid in the visualization of the three-dimensional creation of designer's products. The study of geometrical properties of objects, relationships of components, and the potential for redesign with an additional focus on materiality and image composition are vital activities undertaken in this class. The creative use of the software in executing the construction of various difficult models is a challenge of this class that seems to aid the students in their understanding of the objects that they are designing and the potential processes that will be used to make these designs. By using **form-Z**, an accurate rendition of the shapes and materiality of most designs is possible.

It is with this in mind that our initial exercises begin with the basics of modeling as shape creation. We then explore the relationship of these shapes with the addition of transformation functions and the basic tools of almost any three-dimensional graphics system are covered. The transformation tools are used not only for positioning but also for the redesign and design exploration aspects that they embody.

This approach has been undertaken with the use of various themes. Illustrated here is one involving gears. The images characterize the development of this project from the initial creation to a more involved assembly with the addition of various **form-Z** tools (Figures 1 & 2).

The sweep tool has been explored through the use of a chair design project that has, as one of its requirements, the use of steel rods for the structure. The one that is illustrated here is coupled with an adventure into the use of other tools and material investigation (3).



3. KENTARO HOSHIGA-"CHAIR"

A second phase of this class falls into a category of surfaces and shapes that deal with curvature and in **form-Z** are defined in terms of meshes and nurbs, etc. This portion of the class is vital for our students, as many of their designed forms are not linear. These projects are represented in the utensils project. This exercise provides a real challenge and opens a door to the exploration of more natural forms (4).

At about this time in our curriculum, a project that involves a relationship to human hands is usually conducted. Over the years these designs have consisted of hand tools, door handles, and sink designs (5, 6, 7).

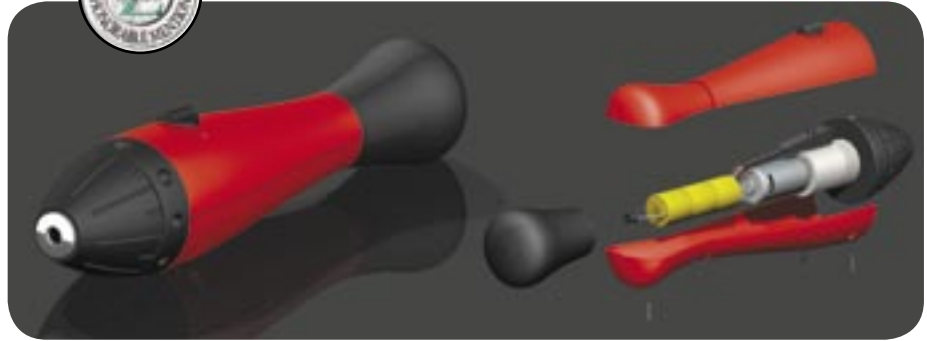


4. YO MAEKAWA -"SPOON, FORK, KNIFE"

The door handle projects had a particular level of difficulty. Modeling the hand required free forms in some cases, which provided a basis for the person whose project is illustrated to develop the confidence to challenge the modeling of a tennis shoe. This turned out to be the winner of last year's Industrial Design award (8).



HONORABLE MENTION IN PRODUCT AND INDUSTRIAL DESIGN
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5. YASUHIDE YOKOI-"HAND DRILL"



7. SHO SUGIE-"FAUCET"



6. NAMI NAKASAKI-"DOOR HANDLE"

The tennis shoe project was a means to advance the modeling experience of the students. The second project, shown here, was done quickly. I have included it, as an interesting expression of materials. With more careful modeling it would have been an exceptional project (9).



8. NAMI NAKASAKI-"TENNIS SHOE"



9. MINEHA KO-"TENNIS SHOE"

In addition, other projects are constructed that deal with various studio designs during this phase of the semester. To close the year a final project is assigned, which the students select by themselves. Sometimes this is an existing product that they want to model or it is a completely new design that they are interested in executing. The existing products often fall into the category of electrical products, cameras, or various other devices, such as those shown below (10,11).



10. HAJIMU IWASAKI-"CELLULAR PHONE"

The design projects have included motorcycles, motorbikes, helmets, etc. The projects enclosed represent the existing product lines. This year's Product Design Awards winner designed a motorbike that was an original conception (12). The runner up (Honorable Mention) was a hand tool project he designed during the semester (13).

Concluding, I would like to thank all the people at **form-Z** for the opportunity our school has to participate in the Joint Study Program. It has provided our students with the use of professional three dimensional design oriented software, which allows them to visualize their ideas and dreams.



11. TATSURO HATTORI-"NIKON"



AWARD OF DISTINCTION IN PRODUCT AND INDUSTRIAL DESIGN
ALSO SEE PAGE #10.



12. GENKI HARADA-"MOTOR BIKE"