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Design surrounds us. It is what attracts us to the clothes we buy and the way we combine them for a certain “look”; it is what interests us in the house in which we reside and the interior environment we create to live in; it is what catches our attention in the advertisements found in magazines, on television, and on billboards. Design envelops us, influences us, enables or challenges us because, it is the products and systems we rely on to satisfy our needs and accomplish our intentions (Shadrin, 1992). In surveying our surroundings, it becomes evident that we are immersed in design. It has a profound effect on our behaviors.

### Definition of Design

This article is about the interdisciplinary nature of functional design lessons. Functional design deals with objects of utility and the decisions that are made in creating those objects. Functional design is a practical and visual art that includes four broad areas: *objects*, *communication*, *environments*, and *experience*. The design of *objects* may be referred to as industrial or product design. It includes the design of tools, furnishings, transportation, and fashion, among others. The design of *environments* is comprised of building and landscape architecture, community planning, interior design, and recreational spaces. *Communication* design encompasses graphic

design and information architecture that consist of publications, packaging, computer graphics, video, film, and advertising.

*Experience* design may be referred to as interactive or event design.

It includes designing occasions in which the user interacts in a situation or plans an event, such as festivals, theme parks, parties, computer and video games, strategic plans, and interactive websites (Margolin & Buchanan, 1995).

### Summer Course

During the past two summers, 24 Northeastern Ohio elementary, middle, and high school art teachers were participants in a course at Kent State University entitled *Design in Art Education*. The purpose of the course was to explain and demonstrate the importance of teaching design as part of the art education curriculum. Participants created design lessons with model prototypes, preparing them to be taught to their students the following academic year. At the time of this writing, many of the lessons have been successfully taught. This article focuses on three projects created by the teachers in the summer course and later taught in their classrooms. Each of these projects reflects the approach connecting design with community.

The descriptions that I have used to explain the selected projects were framed as: lessons about design taught to elementary, middle or

high school students with a) interdisciplinary components; b) community involvement; and c) successful student creations. I conclude them with teacher reflections.

### Community-Based Activities

The community is an essential part of a student's life. Community-based pedagogy works on the principle that effective student learning occurs when teaching is not isolated from the student's life (London, 1994). Community outreach activities may have a beneficial effect for both students and the community. These activities cause students to look beyond themselves to become more informed of community issues and may involve the students in working through a possible solution to a community problem. The community may profit by having students be more involved as active citizens and as possible contributors to solutions for community issues. These lesson examples demonstrate the effectiveness of student involvement in community design issues. The teachers were encouraged to create art lessons that teach design, rely on teamwork, and create interdisciplinary avenues of accomplishing ways to improve their environments or particular conditions.

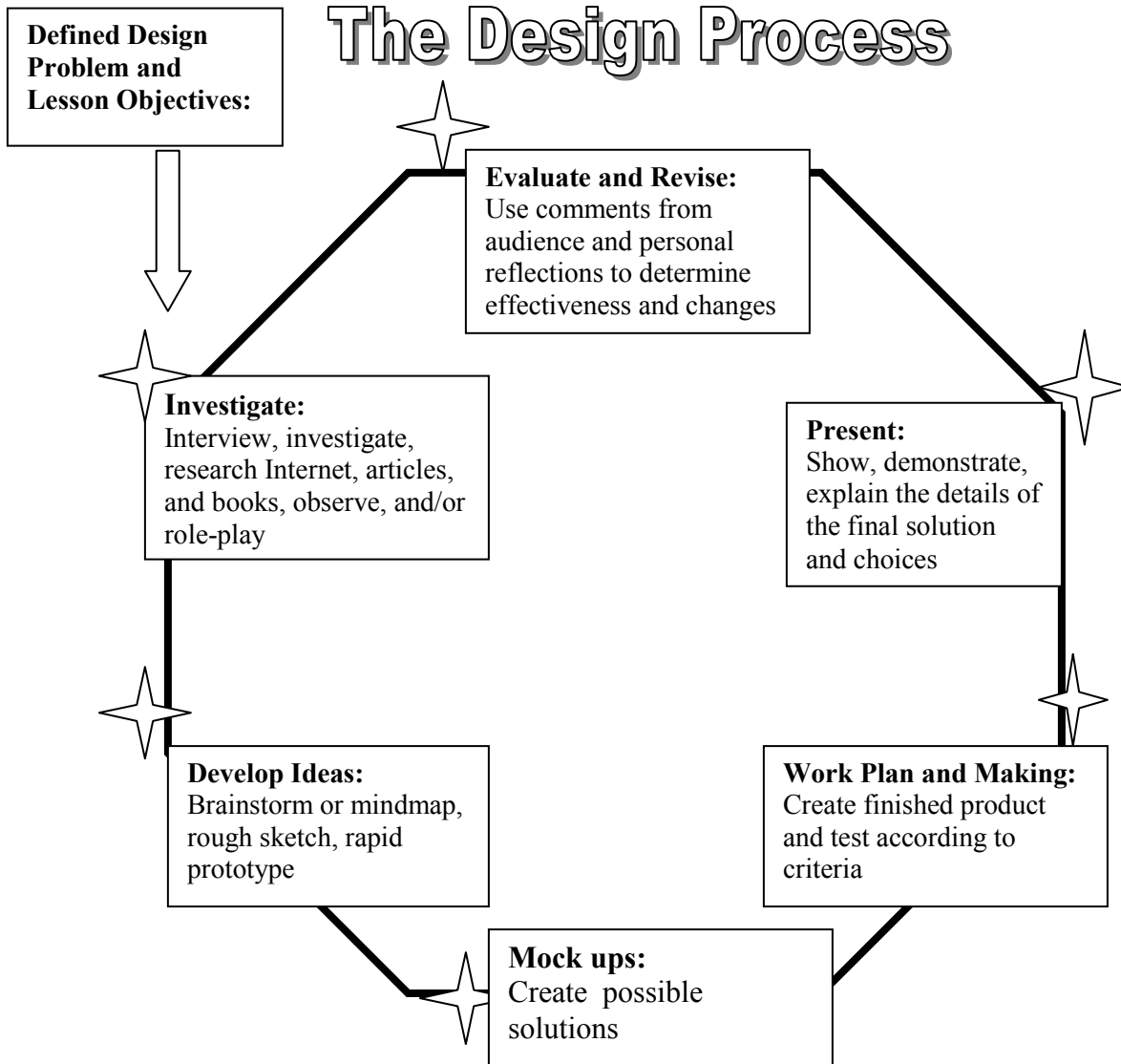
Community-based activities have relevance to the students, because they allow them to have direct encounters with the "real-

world". Very often, effective education involves a team of collaborators, which may include the students, their caregivers, teachers, administrators, and community members (London, 1994). Working with this team of collaborators, students expand their learning experiences through observation, conversation, instruction, modeling, and constructing knowledge. John Zahorik (1995) discusses two educational pedagogies: objectivism and constructivism. Objectivism is used to describe knowledge that is obtained through memorization and recall. Constructivism pertains to knowledge that is built through application of information and activity. In a learner-centered approach to teaching, constructivist projects incorporate interactive learning factors in the simulation of "real world" problems (Dickson, 2003). Design lessons are learner-centered and may simulate or incorporate authentic activities by engaging students with an acting or real client and community design problem to solve.

### Project Planning

In preparing a design lesson, the teacher needs to define the design problem clearly, provide access to background information, give research guidance and determine the aim or purpose of the project. The design process chart (figure 1) illustrates the steps that are followed for this process. The objectives should be defined based

# The Design Process



on the specific characteristics, values and needs of the community for which the designed object or program will exist. Most often, designers work within parameters defined by a client. In this case, the teacher may act as the client. Students will take the role of designer in these lessons. The designer-student becomes the creative thinker,

somewhat of an expert in problem solving, who transforms, combines, or expands on existing designs (Stewart, 2002).

When assessing the outcomes, a portfolio including a worksheet of the problem solving steps, research information, brainstorming sketches, and the final model should be included. It is most effective for the students to give a final presentation, creating the conditions for them to explain and defend their choices. In the career field of design, the final product is usually made public. It is first presented to the client, followed by the potential users or target audience. This invites evaluation from varied sources, offering valuable feedback to the effectiveness of the object or system relative to the aesthetics and functionality.

In a school setting, presentation may take place formally or informally. The students show their models and explain how they arrived at a particular model as the best solution to the design problem. The audience may be classmates, the teacher, community members, design professionals, and/or administrators. Presentation methods may differ, but the benefits remain the same. The student presenter explains and justifies the decisions that went into creating the final solution, allowing for time to reflect and articulate on choices made. The audience gives feedback, offering interdisciplinary perspectives and ideas toward improvement. Self-reflection and

feedback from others is part of the evaluation stage leading toward possible revisions and, more important, expanded thinking.

### The Advantages of Teaching Design

Teaching students about design primarily assists them in thinking critically about a problem through the design process of problem-solving. It also allows them to study interdisciplinary factors and causes them to become more aware of the social, cultural, and economic considerations surrounding a design problem. It encourages them to understand the environment, how to shape and manage it, and accustoms them to work as members of a team. Finally, it teaches them to understand the aesthetic decisions needed for the final, inspired solution and prepares them to be designers or discerning consumers of designed items. Many of the benefits of teaching design relate to the relevancy of talking about items that are familiar to students in their everyday lives.

Design should lead to innovative solutions for a determined problem. The teachers in the following examples acted as clients by presenting the student designers with a problem to solve to improve a situation. Each teacher expressed great satisfaction with the final results and enthusiasm about the response given toward these



lessons by the students, administration, other teachers, parents, and community members.

### Lesson One: Redesigning a Community Park

Kathe Lisy, an art teacher at Parma Senior High School in Parma City School District, taught a six-week lesson to her Beginning Design class on redesigning a small neighborhood park that was in disrepair and located near their school. A neighborhood park may be accessible and easily studied by students as a community outreach lesson. This becomes an effective theme to use in a design lesson because of the relevancy to students and the potential community connections.

The students created plot plans for an environmentally safe park by incorporating new functions for the space. A considerable amount of research was necessary for the students to create an effective plan. They made scale drawings of the site with existing features; they brainstormed ideas for ways the park could be used; they contacted design firms that dealt with environmental design; and they investigated manufacturers of playground recycled materials and equipment. In addition, the students contacted the Parks and Recreation Office several times to notify them of their intentions and to ask questions about both equipment at the site and city ordinances. After creating many sketches, final plot plans were drawn to scale.

These were transferred to presentation boards that also included color printouts of equipment and explanations of the proposed improvements for the existing playground.

A formal presentation was arranged with the Director of Parks and Recreation. The students displayed presentation boards and verbally explained their plans (see figure 2). The plans are now under consideration by the parks staff and the mayor, with the possibility that the plans for this site will be broadened to other parks. The presentation to the Parks Director sparked an idea for another park, that is, to build a putt-putt golf course in Parma. One student presented the following idea, which may be used at a larger nearby park that has a regular police patrol.



Figure 2: Presentation boards for the redesigning of Hollywood Park from students in Kathe Lisy's design class in Parma High School, Parma, OH.

## Lesson Two: Designing for Animal Welfare in Our Community

Mary Mantz, the art teacher at Timmons Elementary School in Chagrin Falls, taught an eight-week art unit entitled *Designing for Animal Welfare in Our Community* to ten third grade classes and five fourth grade classes. The primary goal was to have students participate in a service-learning project that would address the third and fourth grade Academic Content Standards for Art, Social Studies, Science, Language Arts, and Science through an integrative design activity.

The art unit was comprised of three lessons initiated by the local dog warden's visit to their school. The warden talked about the community's dog shelter and the problems it faced. Students, who wanted to find ways to help the shelter, were asked two questions: What are the two main problems facing the shelter? How can we use art to help solve the problems? Students brainstormed ideas during art class and eventually identified what they felt were the two biggest problems: 1) lack of money to improve conditions at the shelter; and 2) lack of awareness, because people do not know about the shelter and its needs. As a result, they determined that they needed to raise money and awareness. They agreed that making pet toys to sell and raise money would be manageable and profitable. Raising awareness could be done through the packaging and pet toy tags that would

provide information about the dog shelter and individual portraits (with “autobiographies,” like those on the tags of the Beanie Babies) of actual animals in need of a good home. *Designing Pet Toys* and *Shelter Animal Portraits* were lessons for the third grade classes. The fourth grade classes did *Packaging for Pet Toys*. Members of both grade levels participated in the sale of the toy products to raise money for the Geauga County Dog Shelter.

In *Designing Pet Toys*, the third grade students were required to make use of current resources and technology to gather information about the pets’ environmental, physical, and social needs. A member of the community, a woman who makes pet toys from fleece material, was invited to demonstrate how she creates pet toys for dogs and cats. She pointed out the many safety aspects that must be considered when making toys for animals. As the students worked through the design process in their sketchbooks, they began to see that they had limited choices if they were to develop and create play objects for cats and dogs that are entertaining, durable, and safe.

*Portraits of Shelter Animals* was the second lesson plan for the third grade. Students’ art lessons about cats and dogs in art included historical information and multicultural representations, followed by viewing pictures of dogs and cats on local animal shelter websites. Each student chose one of the animals to paint and to write about in a

way that would promote his/her adoption. The paintings and written pieces were printed on stickers for tags that got tied onto the toys and onto note card sets.

The fourth grade activity was to create a package design for the third grade pet toys, attractive enough to persuade people to purchase them. They viewed a presentation on package design and critically assessed and identified at least three ways in which advertising and package design persuade consumers to purchase products. Using the design process worksheet, students were required to design a package that was: a) functionally appropriate; b) visually appealing and included a dog or cat image, c) adaptable to different size products; d) durable; e) made without tape; and f) showing good craftsmanship.

The presentation was informal with the individual children explaining what they created and why to their potential customers. The students presented their work to the general public in an effort to sell it to raise money for an animal shelter. The third and fourth grade students conducted the toy sales at various retail locations on two days. Sales were so successful that they were able to present the dog warden with a check for \$1200!

Not only was it a very exciting project for the children and staff but, in addition, there have been some other unforeseen benefits from this project. So far, there are four "Happy Tails" about Timmons

students adopting a homeless dog from the shelter – including from the art teacher. Mary stated that she had received a great deal of positive feedback from parents who told her how excited their son/daughter was about the project activities and goals; in fact, Mary was told that “they don’t talk about anything else!”



Figure 3: Examples of animal toys, packaging, and “Pet Portrait” note tags made by Timmons Elementary School third and fourth grader students in the art classes of Mary Mantz, Chagrin Falls, OH.

### Lesson Three: Sculpture Walk

Anne Jones, art teacher at Brecksville – Broadview Heights High School, worked with her sculpture class to create a sculpture walk along a trail in the woods behind the school. The trail is the home course of the Brecksville - Broadview Heights High School cross country team and the favorite hiking trail for residents of the area surrounding the high school. The trail was the brainchild of the cross country coach, who, with the help of a group of parent volunteers who had pulled together their professional resources, built the trail a few years earlier. As Jones prepared the environmental sculpture unit, the parent volunteers discussed the building process and explained the topographic maps and plans they had used to make the trail. The 52 students in the intermediate art class were challenged to augment the trail with temporary, environmental sculpture.

The students started the project by forming teams and researching the works of Andy Goldsworthy, Christo, Jean-Claude, and other contemporary environmental sculptors. In the research phase of the design process, the students studied the trail, defined the trail users and reasons for enhancing the trail, built scale models of their ideas, searched for environmentally safe materials, and researched ways to preserve natural elements. The sculptures were to be designed to deteriorate with time and weather and cleared away after



a month. At the end of four weeks, the students had created 16 sculptures placed along an eighth of a mile of trail (see figure 4). The presentation of the sculpture walk was an invitation for the public to view the work and incorporate it into their activities. The school community was invited to participate in the Sculpture Walk. Over 700 students, teachers and parents took time to hike the trail and view the sculptures. This offered students the opportunity to engage in interdisciplinary instruction by those teachers who related the sculptures to their subject areas. The humanities class wrote critiques; the creative writing class wrote Haiku poetry inspired by what they saw; the mass media class considered the effect of color on the environment; the earth science class took their leaf identification kits on the hike; and others came simply to enjoy the new additions to the natural scenery. The Sculpture Walk was so well received by the community that it will now be an annual event.





Figure 4: Environmental sculptures created for the cross-country trail sculpture class at Broadville-Brecksville Heights High School in Ohio, Anne Jones, teacher.

### Conclusion

The above student design activities related to community issues. The students provided possible solutions, thus involving them as active and contributing citizens, providing benefits both to their communities and to themselves. The three “real life” learning examples illustrate that the goals of design education may be effectively achieved.

The participating students were able to recognize and appreciate well-designed objects that meld aesthetics with function in an elegant manner. In addition, they learned how design and designers function as an integral part of our society and use invention and imagination to solve problems. As Mary Mantz from Timmons Elementary School explained:

Because we spent some time analyzing a variety of toy designs and packaging (for pets and children due to similar considerations related to safety), the students made comparisons and were able to generate a list of criteria to identify the most effective toy designs and packaging. As the third graders began to make the toys and the fourth graders planned for the toys' packaging, they also all learned about the ups and downs of the design process-- experiencing the joys and satisfaction of producing a well designed product as well as the letdowns and frustrations when they had literally to "go back to the drawing board" when things did not go as planned. There were poignant moments when some students who did not consider themselves very "good at art" were able to figure out ways to solve a particular design problem. For example, Jake was quiet and never stood out in art class. However, when a student at his table was struggling with ways to secure his own package design without the use of tape (a project criterion), Jake showed him how to make a tab and slit design that would hold everything together. When his table mate saw how successful Jake's design worked, he started showing everyone in the class. Suddenly, Jake was a star! When I started requesting volunteers to help sell the products at local retail establishments,

Jake was one of the first to submit his signed form. After his experience of designing and then selling, his mom told me what a wonderful experience it was for him to participate in this project. While his craftsmanship skills in art were considered somewhat low, his apparent engineering and math aptitudes were a valued part of the process, making him feel valued and finally, “good at art.”

Working with a design project can be a logical way to interconnect ideas and concepts. Anne Jones reflected on the interdisciplinary nature of the Sculpture Walk created by her high school students:

It took four weeks of brainstorming, model building, scavenging, engineering and building. While the sixteen installations took shape, teachers in other disciplines were informed of the process going on so they could tie in with activities related to their classrooms. For instance, our creative writing teacher taught Haiku to her students in anticipation for this event so that her students could respond in this style of poetic observation. Our humanities teacher taught methods for art criticism so his students could write critical reviews. Our environmental science teacher asked students to study the space and identify the plant species we had included in our installations. Our world history

teacher encouraged students to look for expressions that could be considered cross-cultural and based in common human experience.

Mary Mantz approached the project as an interdisciplinary activity. She stated:

As the project gained in momentum and size, many areas of the student's learning were being called into play, creating natural connections across the curriculum. While some of these were obvious to the students, others were being experienced in ways that were imperceptible, because it was such a natural flow and integration of ideas and tasks. This project required students to analyze, think/imagine, hypothesize, project, organize, research, plan, create, calculate, write, experiment, document, interact/communicate with others, and assess and evaluate the entire process. No one complained, "Why do we have to read stuff and write in art?" or "We shouldn't have to do math if we are in Art!", because the whole process fit together naturally; the lines of subject demarcation had been eliminated. Though the varied skills were required and being learned, they were part of the

design problem-solving that were interconnected and not viewed as separate subject tasks.

These projects illustrate how community design activities can guide students to become contributors in reshaping the physical landscape of tomorrow and how design is a benefit to the education of all students.

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