

not  
white

*diversity in beginning design education*



Shannon Chance, AIA, Editor

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## Designing a Better Crawfish Trap – Incorporating Indigenous Design into the Beginning Product Design Studio

abstract  
Andy Loewy

Due to the rapid expansion of product markets, design globalization has become a frightening tendency in recent years. Many products have been spread throughout the world with little understanding of the particular cultures in which they are being marketed. The mainstream precept is that if the product is good for us and has been successful in our culture it should be successful elsewhere. This presumption negates a fundamental precept of good product design i.e. that good design is achieved through the understanding and knowledge of the product's user. This knowledge includes, the user's environment, his or her culture and history, issues related to ergonomics, economics, gender, age etc.

I feel that understanding the importance of research and knowledge of user particularities is an essential aspect of a students' early design education. With this sentiment in mind I assigned my students a design project that is based on one of our regions' indigenous industries. A thorough understanding of how the product relates to our area (Southwestern Louisiana) would be necessary. I usually like to start a design project with a recognizable user problem and because one of my students indicated that the present crawfish trap has several severe problems, not the least of which is the fact that raccoons end up eating 20% of the farmer's catch, I decided that designing a better crawfish trap would make a wonderful class project.

The emphasis of this project was on the student's formulation of a personal and discriminating approach to designing the crawfish trap. Historical connections, user needs, ergonomic factors, environmental and social concerns, issues of classic design versus trend design, the search of form thru function, the understanding of product in relation to its production, were areas of investigation and research. Each student created a unique web of information relevant to his or her design convictions based on thorough research. Group brainstorming, group critique, and the conducting research and investigation as a group were required to encourage a collaborative studio environment. The final challenge of this project was to take this complex often-contradictory information web and through the process of 3-d drawing, 3-d computer modeling and a hands on model making approach arrive at a unique and elegant solution. This hands on approach was investigative in nature and emphasized the design process, questions asked and answered rather than focusing exclusively on the end product.

This paper documents the journey my second year design class took in designing a new crawfish trap. The cultural particularities, the various user concerns, everything from speed of baiting, durability, quality and quantity of catch, efficiency of use, economic concerns, historical connections and cultural symbolism, become part of my students' design story.

The key to the success of this project was having the students investigate an indigenous product. Because they lived in an area where crawfish farming practically takes place in their own backyard they were able to achieve a thorough, first hand understanding of the relationship between the user and the product that I believe is necessary to create superior design.

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## Introduction

The rationale for the choice of the Crawfish trap as a design project was to have a class of second year design students experience the importance of qualitative in-depth design research that focuses on collecting local field information. It was also the observation of the teacher that the Crawfish trap has been seriously neglected by designers giving the students plenty of opportunity to uncover user problems relating to the harvesting of crawfish. These user problems served as a jumping off point and gave students an initial design direction for their projects.

This paper describes the journey a class of second year Industrial Design students from Southwestern Louisiana took from when they were given the design assignment to the conclusion of the project represented by their final presentation. It is the hope of the author that documenting this class project will clarify the merits of local indigenous design and the value of incorporating direct experiential research into a class design project.

## In the Beginning...

The students' initial reaction to the Crawfish trap project was far from positive. They were expecting to be assigned a project that would be commonly associated with cutting edge design. We all can imagine what a table, fixture or electronic house ware product might look like when it is designed by a talented designer. But what about a Crawfish trap? The only image that the students could associate with this project was a crude wire pyramidal shaped object that they had seen from time to time lying around the backyards and storage areas of neighbors and friends. In their minds the project seemed far too restrictive in that they couldn't imagine what a well-designed Crawfish trap might look like. For the teacher on the other hand this particular problem was actually an asset. Design teachers know how much time is spent breaking students from their preconceived ideas. Since there were very few Crawfish trap images to refer to, students didn't have to make any effort not to adhere to the preconceived. Even though Crawfish traps have been around for hundreds of years, their design has been amazingly under developed and neglected. Because of this the project had many innovative design potentials that hadn't yet been explored.

The other reaction that the teacher observed amongst his students was the feeling that the crawfish trap was an embarrassing product to design. Maybe this notion had to do with the fact that they knew Crawfish farming too well and that it is not considered a futuristic, advanced, technological occupation. For many of the students, crawfish harvesting represented backwoods Louisiana. From what the teacher could tell they were fond of their heritage and surroundings but had trouble with the idea of designing for it. It could have been that this negativity existed for the same reason that most Philadelphians rarely go to see the Liberty Bell or Memphians rarely visit Graceland. It should be made clear that once the students' research began, and their ideas began to ferment, their initial negative reaction disappeared. Because they had grown up in the environment they were designing for they were able to design at a deeper level than could be expected from a designer with few ties to the area.

## Research

Research is without a doubt a very important design activity. It has been the experience of the teacher that when a student shortchanges the research process the project inevitably falls short. It is important for students to know that what they discover through research will affect their project profoundly. With the Crawfish trap project there was an emphasis on collecting information that was accessible locally. The students were told to take advantage of the opportunities that existed in the immediate area. The following is a handout students were given that categorized their research activity.

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### Research sources:

#### - Local sources:

- § Crawfish farmers professional or recreational
- § Local designers involved with aquatic design
- § Local research scientists affiliated with university aquatic research programs
- § Companies that are connected to the crawfish industry
- § Local libraries.
- § Local aquatic organizations including government groups

#### - Outside sources

- § Internet information
- § National or International experts in the field
- § National library sources

### Research mind set:

- § Be organized
- § Set goals
- § Write everything down and/or draw your ideas
- § Consider more than the obvious
- § Allow your research to go in seemingly absurd directions

### Research techniques:

- § Information gathering, user, other, vicarious or actual experience
- § Group brainstorming

### Research areas:

- § History
- § Function
- § Structure
- § Material factors
- § Ergonomic factors
- § Environmental concerns
- § User considerations
- § Social concerns and cultural concerns

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Students entering second year Industrial Design have a range of organizational skills. Some students are resourceful and are able to locate information easily whereas there are others that feel hopelessly lost. The ability for students to manage their time well is also an area that varies greatly from student to student. Ultimately these time management techniques and research skills have to become part of the design process and are the responsibility of the designer. At the second year level, the teacher can't expect the whole class to understand and use research and time management techniques without outside help. The above hand out help the students keep on track and direct themselves to the research area without too many specifics. It is important not to micromanage the students' research techniques. Part of the excitement for students in developing a project is for them to initiate and carry out the research activity. The hope is for students to feel like they own and have created the project. If there is too much specific direction from the teacher he/she runs the risk of taking the project psychologically away from the student.

### The sketchbook requirement

Design students should make active use of a sketchbook. It is important that they know how important drawing is to a designer, that without drawing communication suffers, not only between designers but also from within the designer. Once students are able to realize and express their internal dialogue of images and ideas through drawing they make a big leap forward as designers. Students should be asked to use their sketchbook on a daily basis and let it become a visual diary. This visual diary should become part of their body and be taken with them wherever they go. The following is a list of the type of information that ought to become part of this diary.

1. Information, images, and ideas about their current project.
2. Design insights. These are inspired solutions to design problems. Sketches, images and descriptive words.
3. Design problems that have been noticed either by one's own experience or by observing others. Sketches, images and descriptive words.
4. Thoughts or images that are important to the designer for almost any reason should find their way into the sketchbook. (See Figure 1 and 2.)

It is good for students to be open to the use of many different kinds of media when entering

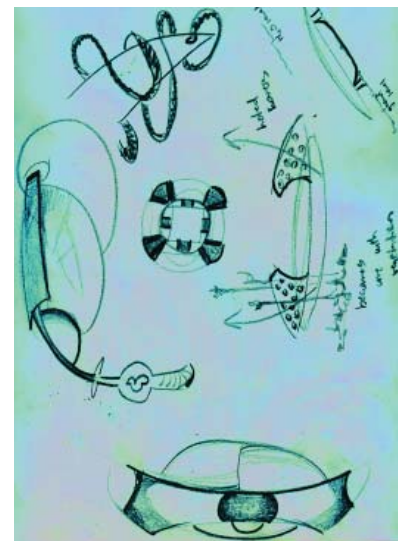
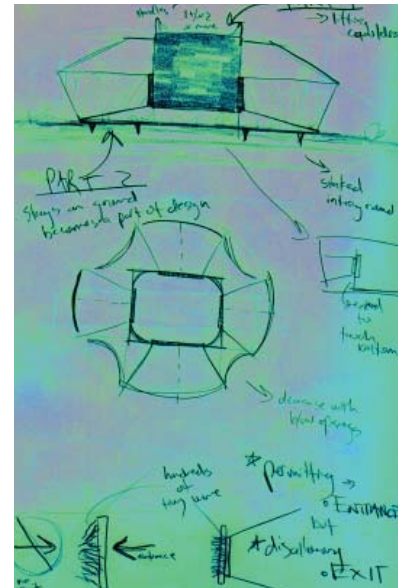


Figure 1, 2 - Mentally active or informed drawings.



Figure 3 - Brainstorming board.



Figure 4 - Students with experimental traps.

information into the sketchbook. Pen, pencil, paint, collage, poetry, descriptions, diagrams are all very acceptable. The sketchbook should not be proscriptive in nature but rather be a receptacle for experimentation and newly found discoveries. In addition design students should learn to draw what is inside their mind. The designer's thoughts and ideas for solving problems should go from the brain to the paper. This kind of drawing makes for informed active drawing. Often informed drawings are beautiful and they always have more meaning than simply an image.

### **Brainstorming**

Brainstorming is a method that is being used by cutting edge design firms. A group gets together with drawing pads, a large bulletin board, pushpins, magic markers and proceeds to throw out any idea that comes to mind regarding the subject being brainstormed. The two most important tenets of brainstorming are first; that no one is allowed to be judgmental about someone else's idea regardless of how crazy it might seem and second; the more ideas that are turned the better. A successful brainstorming session might turn out 100 ideas an hour. (See Figure 3.)

Tom Kelly the general manager of IDEO wrote a book called The Art of Innovation that should be on the reading list of every Design student. Kelly describes the kind of chemistry that is needed to make a design firm successful. Brainstorming is a tool that they use often and with success. The notion that given the right environment everyone can innovate is a central theme of the book.

Allowing students to work together is a valuable exercise and a learning experience for every one. Brainstorming is a wonderful way to allow students to think and work together. At the very least they are being prepared for situations in the future that will require interacting with a group. More than that, the exercise will most likely produce more unexpected design directions than any single student would have thought of. Hence, the mantra of IDEO; "Enlightened trial and error succeeds over the planning of the lone genius."

### **Identifying the problems**

After weeks of research and many field trips my students had uncovered lots of problems with the present Crawfish traps. Most of these problems would never have been recognized had the class not had access to the local experts or had not been able to go out into the field and actually witness the crawfish harvesting procedures. Many of these problems influenced their final trap designs. The following is a list of the most important problems that they found.

1. The traps were attacked by predators such as raccoons, and caused much of the crawfish catch to be eaten by the predators.
2. Entrance funnels did not keep all crawfish inside the trap. A substantial percentage of crawfish escaped the way they came into the trap.
3. Large birds such as gulls and egrets would land on the part of the trap that emerged from the water and tipping the trap over at times allowing the crawfish to escape.
4. Due to the lack of oxygen at the bottom of the pond there was a problem with keeping the crawfish alive. The crawfish die easily from oxygen debt. It is common for farmers to harvest dead crawfish when the water conditions are not right.
5. The three entrance funnels that are on the lower corners of the pyramid traps were not always possible to orient in the correct direction in relation to the water flow to get the optimal crawfish catch. Crawfish are attracted to the scent of the bait and if the trap is oriented incorrectly they don't find the entrance of the trap as easily.
6. The three entrance funnels were not shaped in a way to allow for the best catch. The funnels were long and cylindrical instead of being large at the opening to encourage the entrance of the Crawfish.
7. Getting the crawfish out of the trap when harvesting was relatively awkward. The students observed a lot of unnecessary shaking of the trap.
8. Not as many crawfish per trap were dumped out as one might hope for. The students felt there was potential for larger yields per trap.
9. The Traps were relatively unattractive, not designed esthetically and according to the farmer didn't last as long as one might expect. After three or four years the traps have to be replaced.
10. The traps took up a lot of room when stored during the off-season. They were not collapsible and did not have the ability to nest with each other for efficient storage.

And other facts they learned about crawfish in the field from experts that had an influence on the design of their traps.

1. Crawfish attract other crawfish while feeding from the bait.
2. Crawfish are attracted to sheltered areas such as the underside of tree stumps.
3. Crawfish are attracted to oily fish bate. (See Figure 4.)

## The Crawfish Trap and Design Innovation

The students were required to isolate a problem that they had become aware of during the research phase of their project and test out a solution by designing a field experiment that would give them information with which to design. For example, if a student was interested in the fact that many Crawfish escape the trap by leaving the way they came in, he or she would design an experimental trap that would not allow this to happen. The students were told not to spend a lot of time in the making of these traps. The experimental trap was to be functionally built with the intent to prove or indicate a solution to an isolated problem.

We were rewarded profoundly with this exercise. The amount of design information that the students received from going out into the field and setting up a crawfish trap experiment was really remarkable. Not any of this experimentation that was so critical to their ultimate designs could have been preformed if we hadn't been in a crawfish-harvesting region. Much of information that the students brought back from the field found its way into their projects. (See Figures 5, 6, and 7.)

### Presentation:

The following is a handout the students receive to help organize their presentation process.

#### Gathering information for presentation:

- § Locate all work to date and organize it. You should have:
1. Conceptual drawings (computer and hand)
  2. Conceptual models (computer and hand)
  3. Documentation of process
    - A. Photographs of techniques used
    - B. Process models, molds, drawings and other physical items that illustrate your process
  4. Finished drawings and models
    - A. Drawings of finished model
      - a. Orthogonal and plan drawings (dimensioned)
    - B. Photographs of finished model
    - C. 3-d Rhino model of trap (printed and rendered in photoshop)
    - D. Scanned images manipulated in photoshop
  5. Written information
    - A. Description of product
      - a. Title
      - b. Concept
      - c. History
      - d. Innovative aspects
      - e. Interface
      - f. Design
      - g.

#### The presentation process (20 x 20 board)

##### Research sources:

- § Method
1. Create a hierarchy for your information. Remember this is an exercise in communication.
  2. Make numerous 4" x 4" thumbnail drawings of possible board layouts (20 is not too many).
  3. Bring the subject or concept of your project into the design of your board layouts.
  4. Make 20" x 20" mockups based on your best thumbnails (quick and dirty)
  5. Based on your class crits and your own evaluation improve upon your



Figure 5,6,7 - Students setting experimental traps.

mock- up.

6. Create your mock-up in color (quick and dirty).
7. Create your 20" x 20" board with photoshop. Print it out cheaply in black and white and evaluate.
8. Tweak your 20" x 20" board, print and mount on foam core.

### **Conclusion:**

The emphasis of this project was on the student's formulation of a personal and discriminating approach to designing the crawfish trap. Because the project was indigenous to our area there were tremendous advantages with regard to collecting cultural environmental and functional information. The information collected was far more sensitive than if it were not experienced first hand. It is the contention of the author that good design happens in the presence of good research. This paper supports the argument that the best research is achieved at the local level pulling from the local environment and local culture. The students that took part in this project found that once they overcame the initial stigma that is associated with a local industry they were able to take advantage of the industries' accessibility and bring first hand experiential information to their crawfish trap design.

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