

Sharpening One's Axe: Making a Case for a Comprehensive Approach to Research in the Graphic Design Process

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Abstract

"If I had eight hours to chop down a tree, I'd spend six sharpening my axe." – Abraham Lincoln.

Mr. Lincoln's advice is, of course, very good, and applicable to many pursuits. Yet many graphic design practitioners and students often routinely ignore this sentiment, and dive directly into form-making activities when presented with a design problem. In most cases we tend to rely on intuition and our "best guess" to construct a solution, without the benefit of the various types of research that might provide a clearer insight as to how our efforts might be more effectively directed. Our profession might be characterized, if you will, as "swinging a dull axe."

I intend, therefore, to put forward a concept for a comprehensive model that incorporates the various types of research activities that graphic designers might employ in the process of creating effective solutions to the problems we generally address. These activities will be tied to a typical model of the design process, which involves such basic steps as problem investigation, analysis and planning, and synthesis and evaluation. The types of research activities discussed will include: gathering and analyzing competitors' efforts and related approaches to similar projects; establishing criteria for evaluating design efforts; and approaches to soliciting generative, evaluative, and experiential feedback from users and audiences members.

As well, different methods of user research techniques will be demonstrated, including survey research (what viewers say), observational research (what viewers do), and participatory research (what viewers make). Discussion of the strengths and weaknesses of these techniques as they apply to typical projects will be discussed. Finally, examples of student work will be included, as will explanations of the kinds of research techniques used to inform these design solutions.

The goal of this paper is to present the basic information needed for graphic designers to consider incorporating the demonstrated research techniques in their work. It is my hope that more graphic designers will pursue a research-based approach to the process of creating appropriate and effective communications for the various users and audience groups for which they design.

Introduction and acknowledgements

The approach described in this paper results from a view of design as a problem-solving activity — as opposed to a view that primarily stresses self-expression. A number of the research activities employed are viewer-centered, and require direct involvement of members of the user groups or audience groups for whom the communication is intended. Both quantitative and qualitative research methods are used as would be appropriate to the particular design problem, sometimes combined

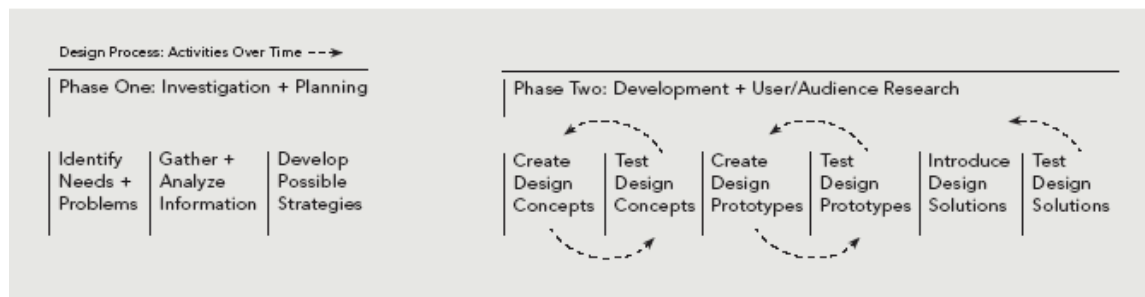
within a single research activity. Please also note that the terms "audience" and "user" are used to denote two slightly different meanings in this paper. Audiences are generally considered to be larger groups of viewers, and the research methods discussed in regard to audience-centered projects are mostly perceptual in nature (such as measuring impressions of trademark concepts). On the other hand, users are often considered to be smaller groups of viewers, and the research methods discussed in regard to user-centered projects are mostly performance-based (such as measuring a users ability to locate a destination via viewing existing signage in an environment).

The specific research methods discussed have been explored and written about by many others, and the past works of fellow design educators Allmendinger (1996), Byrne (1990), Frascara (2004, 1997), Poggenpohl (1996), Roth (1999), and Sanders (2002) have been extensively drawn upon. As well, the work of researchers in engineering and the social sciences have been referenced, including publications by Clarkson, et al (2003), Schuler and Namioka (1993), and Scrivener, et al (2000). Two much older (but still very applicable) texts have also been drawn upon — Cherry’s description of the process of human communication (1957), and Osgood’s use of the semantic differential as a tool for measuring basic viewer response to visual communications (1967). The work of all of the above authors is gratefully acknowledged as the foundation for this paper.

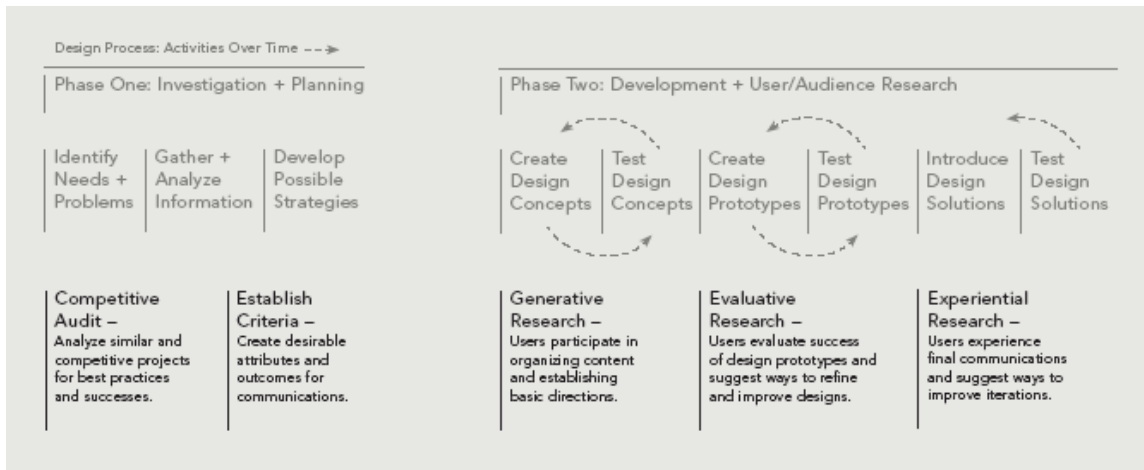
This writing is also a continuation of the author’s past work, including a recent call for a more inclusive and user-centered approach to graphic design practice (Nini, 2002), and the results of a large-scale survey of US graphic design practitioners concerning their involvement with design research activities (Nini, 1996). Finally, many thanks to the design students at the Ohio State University for their hard work, and for the use of the project results shown and discussed below.

Creating a model of the design process

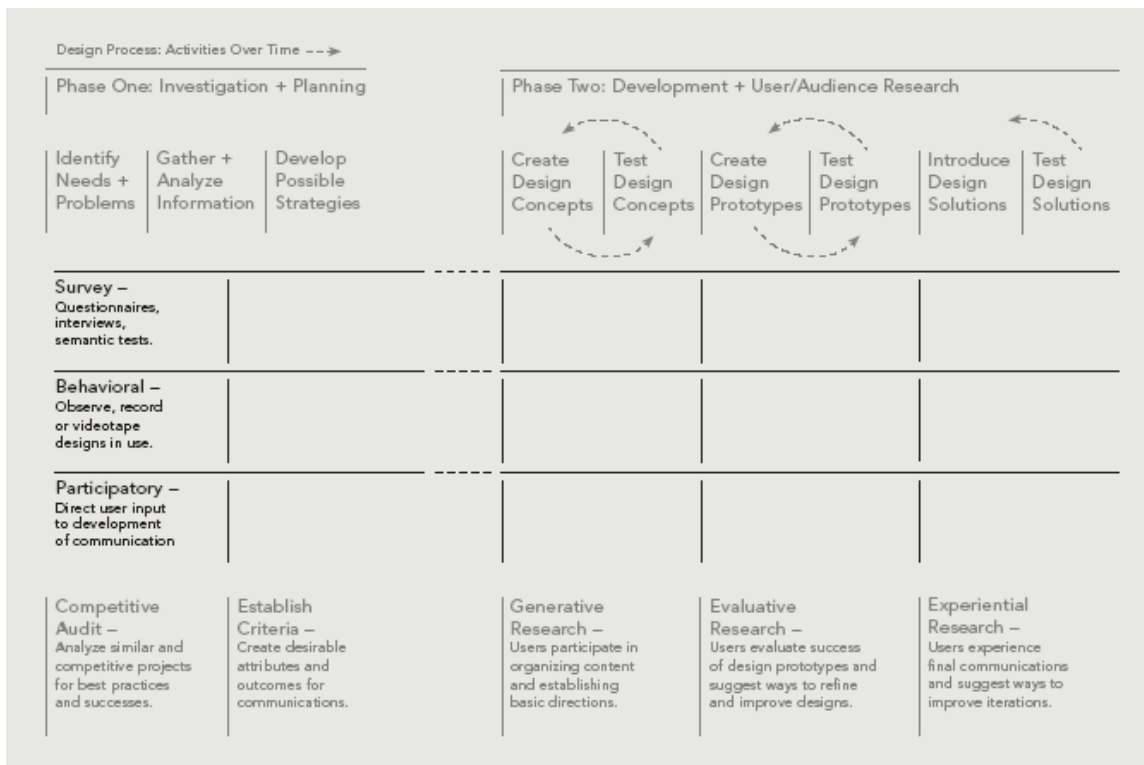
While every designer’s approach to designing differs somewhat, it is possible to construct a model of the design process that includes the basic tasks and activities involved. The below model is represented in a linear fashion, as earlier steps often precede later ones. We all know, however, that real life is often not so neatly organized, and that the particular path we might take on a given project may vary from the one presented here. The main value of a process model, therefore, is its ability to act as a kind of guide to our efforts, allowing us to tailor it to the needs of the project at hand.



The basic design process can be broken into two distinct phases (above). The first phase is devoted to investigation of the design problem, and the creation of strategies to address the specific issues found. The second phase is devoted to developing design concepts and further refined prototypes and solutions. Concurrent with each stage of development in the second phase are iterative rounds of user or audience testing, which allow specific improvements to be made prior to implementation. At this point it is also possible for the entire process to begin again, as user or audience testing after introduction of the communication may reveal possibilities for further generations or editions.



Activities typical to each phase (above) include an audit of competing or similar design efforts, and the creation of desirable attributes for the designed communications. A better awareness of the state of the art is achieved through the first activity, while the second can supply agreed-upon criteria for eventual testing in phase two. Users and audience members can then provide input into the organization of content and basic visual approach of design concepts — while also providing evaluation of design prototypes for further refinement and development, and experience using final communications after their introduction.



Finally, it's also helpful to consider the three main methods for conducting user or audience research (above) as part of the design process. Survey research can be used to determine impressions concerning various aspects of designed communications, while behavioral research can provide insight through observation of users' actions. Participatory research can allow for a partnering with users to create communications that meet specific needs for particular contexts.

Using the design process model as a planning tool

The complete process model as shown above can also be used as a tool to plan specific research activities for most types of visual communication design projects. While almost all projects will require the basic steps outlined in phase one, different types of user or audience research would be employed elsewhere in the process, depending on the nature of the project.

By using the model to consider all possible combinations of research methods, specific user and audience research plans can be created as needed. Below is an example of a research plan specific to corporate identification design. As a primary goal of this type of project is to create a particular impression in the minds of audience members, it's appropriate that survey research tools be mainly used to gauge the success of both existing and proposed design efforts.

Survey – Questionnaires, interviews, semantic tests.	Measure Perceptions of Existing Identity	Measure Perceptions of Initial Directions	Measure Perceptions of Refined Directions	Measure Perceptions of Final Identifier
Participatory – Direct user input to development of communication	Solicit Audience Ideas for Possible New Representations	Corporate Identification Design – Audience Research Plan		

Notice the similarities of the top two individual research plans (below), created for interaction + interface design projects and environmental graphic + wayfinding design projects, respectively. As both types of projects mainly concern users navigating space (whether virtual or physical), it's appropriate that behavioral research be the predominant method used. The final research plan (below), created for task-oriented information design projects, uses all three audience and user research methods — due to the potentially more complex nature of the problem, and the need to work more closely with the user group throughout the design process.

Behavioral – Observe, record or videotape designs in use.	Record Users Navigating Existing Interactive Media	Record Users Navigating Initial Interactive Directions	Record Users Navigating Refined Interactive Directions	Record Users Navigating Final Interactive Media
Participatory – Direct user input to development of communication	Solicit User Suggestions for Organizing Interface	Interaction + Interface Design – User Research Plan		

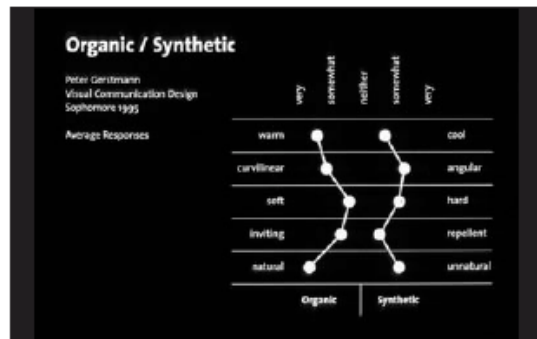
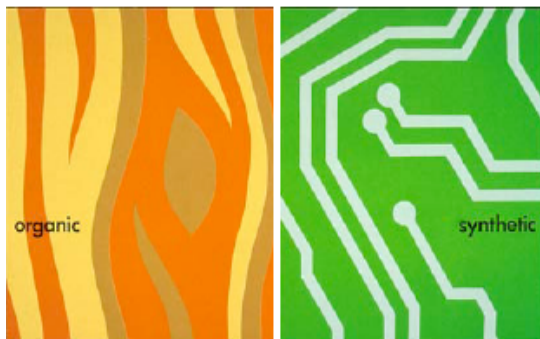
Behavioral – Observe, record or videotape designs in use.	Record Users Navigating Existing Environment	Record Users Navigating with Initial Directions	Record Users Navigating with Refined Directions	Record Users Navigating with Final Signage
Participatory – Direct user input to development of communication	Solicit User Views of Organization of Environment	Environmental Graphics + Wayfinding – User Research Plan		

Task-Oriented Information Design – User Research Plan				
Survey – Questionnaires, interviews, semantic tests.	Determine Users Physical Limitations and Special Needs			
Behavioral – Observe, record or videotape designs in use.	Record Users Performing Tasks in Environment	Record Users Performing Tasks with Initial Directions	Record Users Performing Tasks with Refined Directions	Record Users Performing Tasks with Final Information
Participatory – Direct user input to development of communication		Allow Users to Reorganize Content as Needed	Solicit User Views for Refinement of Visual Elements	

Not all user and audience research methods are appropriate or effective for all types of graphic design problems. By understanding the strengths and weaknesses of each method, the designer can construct a logical and workable research plan for any given project, and combine the above research methods as called for by the nature of the problem at hand.

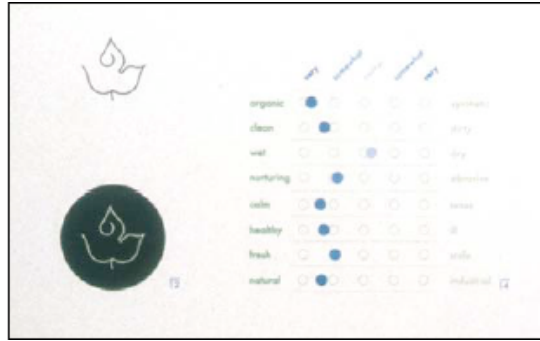
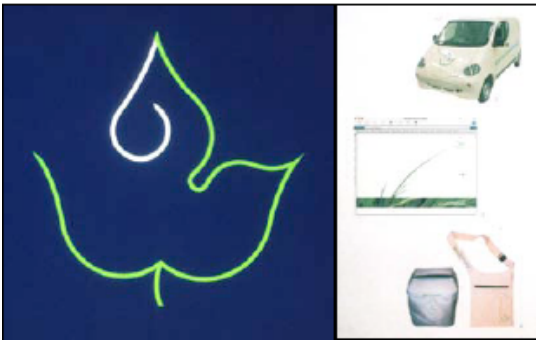
Examples of student projects using this research approach

Following are examples of undergraduate student projects from the visual communication design program at the Ohio State University, where the basic research approach just described has been introduced and put into use. Some of the projects are fairly simple and short-term, as would be appropriate to basic graphic design courses, while others are more complex and long-term, as would be appropriate to more advanced course-work.

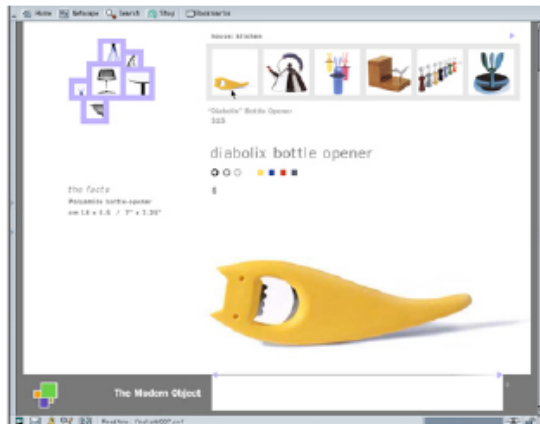
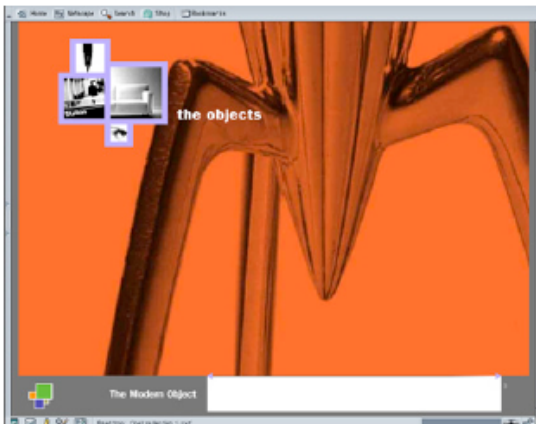


Above (left) is the outcome of a basic-level graphic design course project, where students are asked to create visual representations of opposing concepts, and then conduct a simple audience-testing exercise to measure the effectiveness of their efforts (results at the right, above). Students first construct compositions by hand (with no words appearing to label the concepts), and use these versions to test with audience members. They show each composition to twenty randomly chosen viewers, who are asked to complete a semantic differential survey form and rank a particular concept with five associated words and their antonyms.

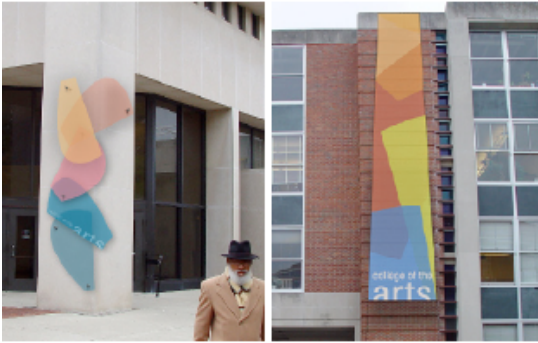
Students then create a graph (as above, right) that displays the average viewer responses on the semantic differential scale. Audience responses to compositions that properly convey the intended properties will naturally fall to the appropriate side of the scale. Students also consider any written responses from viewers while refining their compositions, and then create final versions on the computer (where the original concept words are added). The basic process of defining desirable attributes for their efforts, creating and testing a visual concept, and refining that concept based on viewer response is introduced through this project, and gives beginning students a glimpse of the approach that will be used throughout their subsequent courses.



Survey research is also applied in an intermediate-level course project, the development of a visual mark as part of a corporate identification system. To the left (above) is a student created mark for an organization providing environmental clean-up services, along with application of the mark to various items. To the right are average audience responses to a list of desirable attributes, including the words organic, clean, wet, nurturing, calm, healthy, fresh, and natural. Almost all of the attributes were perceived as intended in this case, falling to the desired side of the scale. Students gather viewer responses using a fairly tight black and white sketch of the mark, so that any refinements prior to implementation can incorporate suggestions or comments that come from audience member responses to the design concept.



Behavioral research is also employed in the development of interactive media, such as the above examples from an advanced-level student web-design project. In this case, the student observed users navigating other e-commerce sites, noticing problems with how various visual interfaces presented the idea of a virtual “shopping cart.” This led the student to allow users to drag objects into a scrolling field (at the bottom of the screen designs) that presented smaller images of the items to be purchased, thus giving users a visual reference of their shopping choices. The student then tested this interface concept with users, and refined the interaction design based on further feedback and evaluation.



Similarly, advanced-level students engage in behavioral research in the context of environmental graphics and wayfinding systems design. The images to the left (above) are some concepts for exterior signs to identify the major entrances of visual and performing arts buildings on the Ohio State campus. Students observed the flow of people entering the various buildings throughout the day, and developed customized signs that took advantage of optimal placements, based on likely views from approaching the buildings on foot (the typical manner that almost all users access the buildings).

They also used digital video as a tool to track users navigating the interiors of various campus arts buildings, looking for situations where confusion arose in a consistent manner. These observations gave them insight into critical locations for the placement of interior wayfinding signs, where full-scale mock-ups could then be placed and tested for their effectiveness. The images to the right (above) are still images from one student group's final video presentation, where they asked several arts students to find the Dean's office, and documented the resulting problems with completing that particular task.

The final examples (below) are from a task-oriented information design project, completed by an advanced-level student. In this case, the student used mostly participatory user research methods to develop a cookbook for individuals with mental retardation and developmental disabilities. Working closely with users (and their caretakers) in a group home, the student was able to evaluate various approaches to displaying cooking information in the kitchen setting, and eventually develop the most effective presentation.

An early concept was a poster display, using clearly numbered rows of information presented in sequential steps. Testing uncovered, however, that the users did not necessarily follow the horizontal rows, and were more apt to move vertically down the page to obtain the information. These findings led to a much simpler approach in book form, with no more than two steps presented on a single page, or a total of four steps on a spread of two pages. This organization allowed the users to follow the sequence successfully, and kept them from being overwhelmed by too much simultaneous information. Further user evaluation of mock-ups resulted in a final book format with large page sizes (for viewing from a distance of a few feet), laminated pages (in case of spills) and wire binding (so the book could lay flat on the kitchen counter). All of these design decisions were a direct result of the process of partnering with the users in the development of the communication.



Let's Cook!



1
Get your equipment.



4
Put the saucepan on the stove.



5
Turn the stove on "Hi."

Some final analysis and comments

The above student projects represent results of course work completed in no more than ten weeks, the length of an academic term at The Ohio State University. Compared to the time and resources available to professional designers and researchers involved with similar projects, the research activities and student outcomes may be somewhat lacking in depth, and most likely do not provide definitive solutions to the particular design problems addressed. As well, due to a lack of available documentation, the kinds of data typically reviewed by serious researchers are not presented in this paper. The students' results do, however, represent their initial experiences involving interactions with viewers, and provide a stepping-stone to continue such activities as design professionals. In fact, many Ohio State alumni have taken on leadership roles in the profession, expanding and building upon the research techniques previously discussed, while successfully applying them to a variety of visual communication problems.

In most cases students are accepting and enthusiastic in regard to viewer-centered approaches to graphic design. While some resistance is initially encountered, it usually disappears quickly, once students realize that interacting with viewers allows them to create potentially more effective results. Similarly, most users and audience members are generally grateful for the opportunity to voice their opinion on communications meant for their use — though there is always a small minority that view any attempt to interact with them as an intrusion, and prefer not to be bothered.

Working with viewers can also have potential liability issues for students, institutions of higher learning, and design practitioners. It's a very good idea to require that all users and audience members sign a waiver form agreeing to participate in the study, and to give permission to the researcher to use the results as necessary. Many universities require review and pre-approval of any research that involves human subjects, and that process, while time consuming, must be followed. Professional designers would do well to consult with a legal advisor concerning similar steps that they might take to protect themselves when working with users and audience members.

To conclude, many graphic design education programs tend to impart the values of the artist to students, stressing the concept of an individual with a strong personal viewpoint to express through

their work. While this approach can make for some very interesting visual results, it seems a bit narrow in its focus when one considers the very real and important needs of the various users and audience members who experience our work on a daily basis. By focussing so strongly on our own interests and agenda, we run the risk of excluding or alienating those for whom the communications we develop are intended. It can be easily argued that one of our most important contributions to society is the simple act of creating communications that are effective for audiences and users. But this goal can not be achieved without first making the step to identify and include those individuals for whom we design, so that they may fully participate in the process of creating useful communications.

Therefore, I urge all graphic design faculty members to examine the values they impart to their students through their programs, and make adjustments as deemed necessary. For those that wish to pursue a more inclusive approach, I hope that this paper offers some guidance as to how such a design process could be structured. There is still much exploration needed in this area, and I welcome all designers and educators to join my colleagues and me in this important undertaking.

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