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Practical Applications of Design Semiotics

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Practical Applications of Design Semiotics

A Thesis Submitted to the Faculty of
The College of Imaging Arts and Sciences
in candidacy for the degree of
Master of Fine Arts in Computer Graphics Design

Amy Bendall

October 28, 2004

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Title: Practical Applications of Design Semiotics
Submitted by: Amy Bendall
Date: October 28, 2004

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Abstract

This thesis explores instructional design and how it can be implemented in a large lecture course in order to improve the comprehension and retention of theoretical design concepts.

My thesis was inspired by the difficulty in teaching first year undergraduate students design theory in the required undergraduate course Design Survey. One consistent problem is the student's inability to understand how these abstract concepts apply to them individually and within their academic discipline.

Keywords

Instructional Design

Design Semiotics

Design Analysis

Online Learning

Multiple Intelligences

Graphical User Interface

Flash

Usability

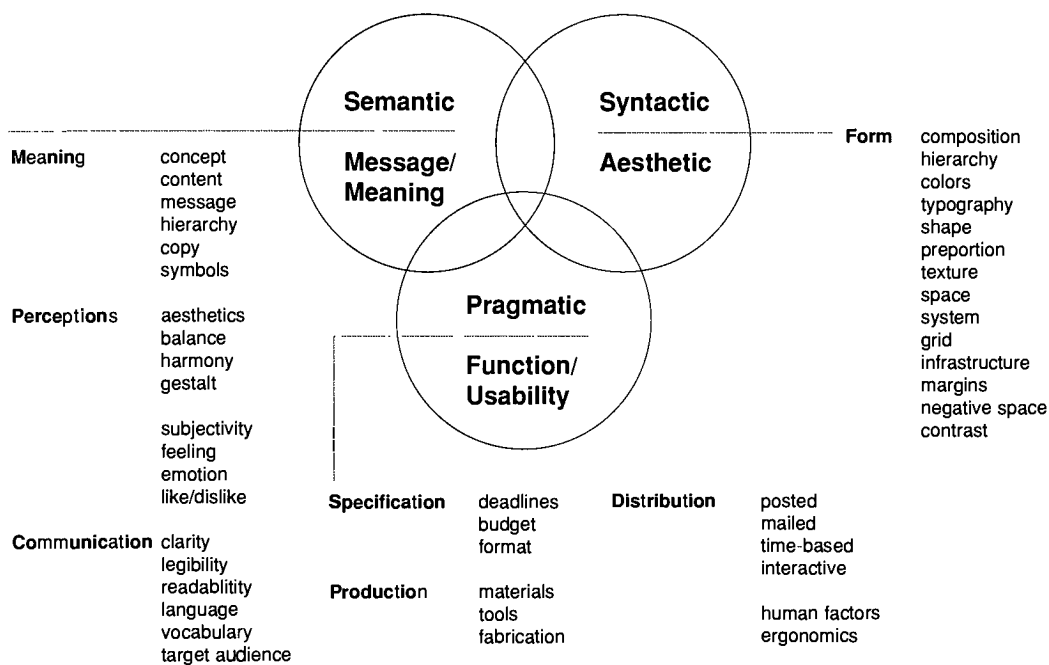
Information Design

Background

The following Semiotic Design Chart is currently used in the evaluation lesson of Design Survey class to illustrate theoretical principles and vocabulary related to design semiotics. There is a lot of valuable information within the chart but the students have a hard time understanding how it is relevant to their learning experience. The chart was developed specifically for the Graphic Design field; therefore, relevance seems to be an even bigger problem among Industrial Design, Interior Design and New Media students. In addition the size and diversity of backgrounds and interests of Design Survey students creates unique challenges to effectively and efficiently explaining the concepts.

Relevance of Design Evaluation

The vocabulary and theoretical concepts introduced in Design Survey provide students with the tools for school and their careers. These concepts are the building blocks of design evaluation. Without an understanding of these concepts, students lack a valuable tool to develop, critique and defend their design choices.



Semiotic Model of Design

Every designed item has three distinct dimensions:
semantic, syntactic, pragmatic.

This model serves as an objective basis for evaluating both the favorable attributes and unfavorable attributes of a design.

Semantic

Refers to the relationship of a visual image to a meaning. How well does the design represent and message? Do people fail to understand the message the design denotes? do people from various cultures misunderstand the design?

Syntactic

Refers to relationship of one visual image to another. How does the design look? How well do the parts of the design relate to each other? Is the construction of the design consistent in its use of figure/ground, solid, outline, overlapping, transparency, orientation, format, scale, color, and texture?

Pragmatic

Refers to the relationship of a visual image to a user. Can a person use the design for its intended use? Is the design legible in typical viewing distances and lighting? Is the design difficult to reproduce?

Research

After selecting this topic I began research on both traditional educational theories and more current documentation on approaches to instructional design. Instructional design provides the opportunity to reach more educational goals by integrating a multimedia approach to learning. This is especially pertinent in a large lecture course like Design Survey where individual students would not traditionally have access to the lessons content as the quarter progressed. Through research it became clear that the combination of instructional design and Internet delivery would provide the opportunity to overcome several difficulties inherent to a large lecture course:

- Addressing students with different learning styles
- Reinforcement of concepts introduced to students in class
- Making information relevant to students from various programs
- Illustrating complex theoretical concepts visually
- Information should be accessible to students at all times

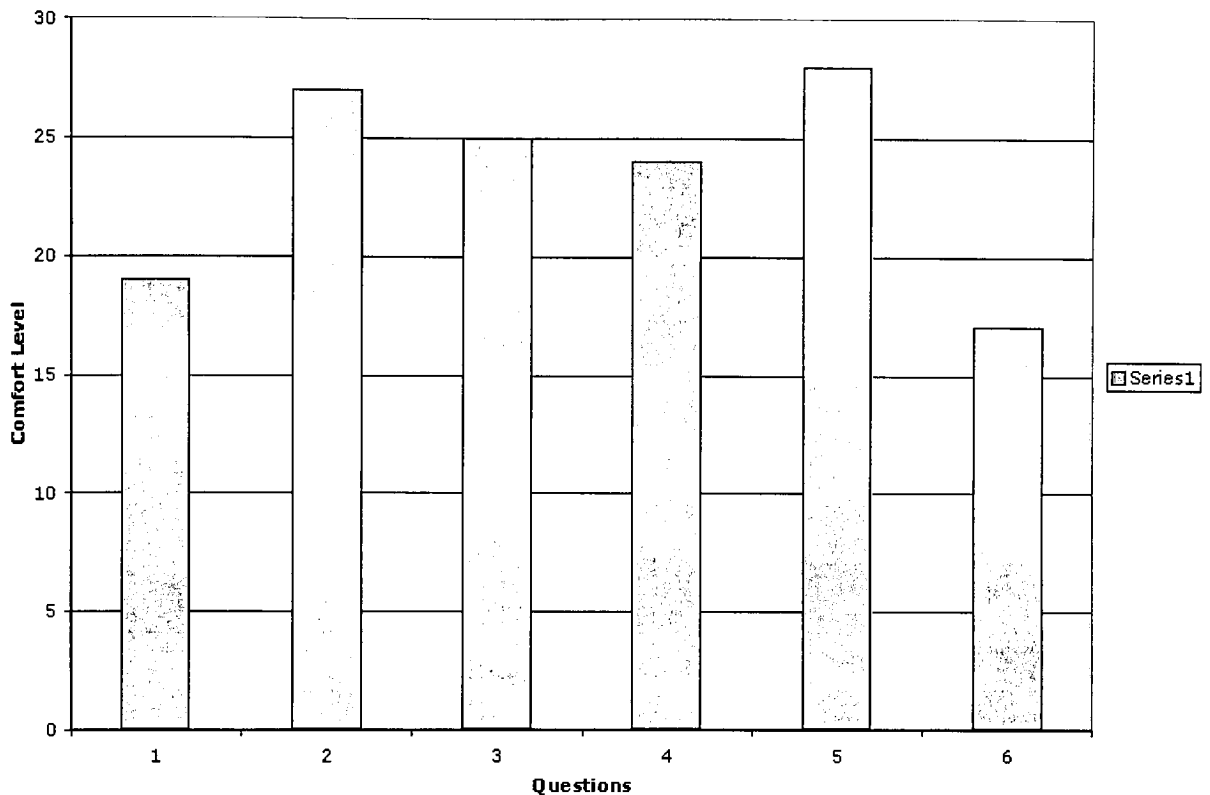
After gathering a base of information it was necessary to assemble a focus group from the Design Survey Class and assess their comfort level with the concepts that are covered within the Design Evaluation lesson. The questions on the survey were presented with a scale of one to five, one being the least and five the most comfortable.

Thesis Survey 1: Design Semiotics

Read each statement carefully. Fill in box one through five depending on how strongly you agree with the content of each statement. One being the least and five being the most.

	least			. most	
	1	2	3	4	5
I would feel confident in defining each of the three components in the design model.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I understand the relationship between Semantic (Message/Meaning), Syntactic (Aesthetic) and Pragmatic (Function/Usability).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I could analyze the message and meaning of a product or design.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I could analyze the functionality and usability of a product or design.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I could analyze the design and aesthetic of a product or design.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
After studying the Semiotic Design Model, I understand how the definition of a project's "success" may change depending on which of the three distinct dimensions is emphasized.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Initial Survey Analysis



This graph shows the results of the focus group surveys. The x-axis represents the questions and the y-axis represents the cumulative score indicating the participant's level of confidence with that question.

The results of this survey show that students were least comfortable in two areas; (1) defining the three components of the design model; (2) understanding how the analysis of a design or project could change depending on which of the three aspects of design were emphasized. In addition to the surveyed issues, it also became clear that, (3) Students viewed and understanding of the Semiotic Model as at least unrelated to or at worst, irrelevant to their education and future career. This data helped to focus my thesis project on developing an instructional tool that addressed these particular issues.

The survey was effective but the traditional paper format was difficult to distribute and receive. At the end of my thesis project I would have even less access to my focus group, so I decided to design an online survey that would connect to a database to collect data from the final survey. I took an independent study in ColdFusion in order to learn how to develop this survey application.

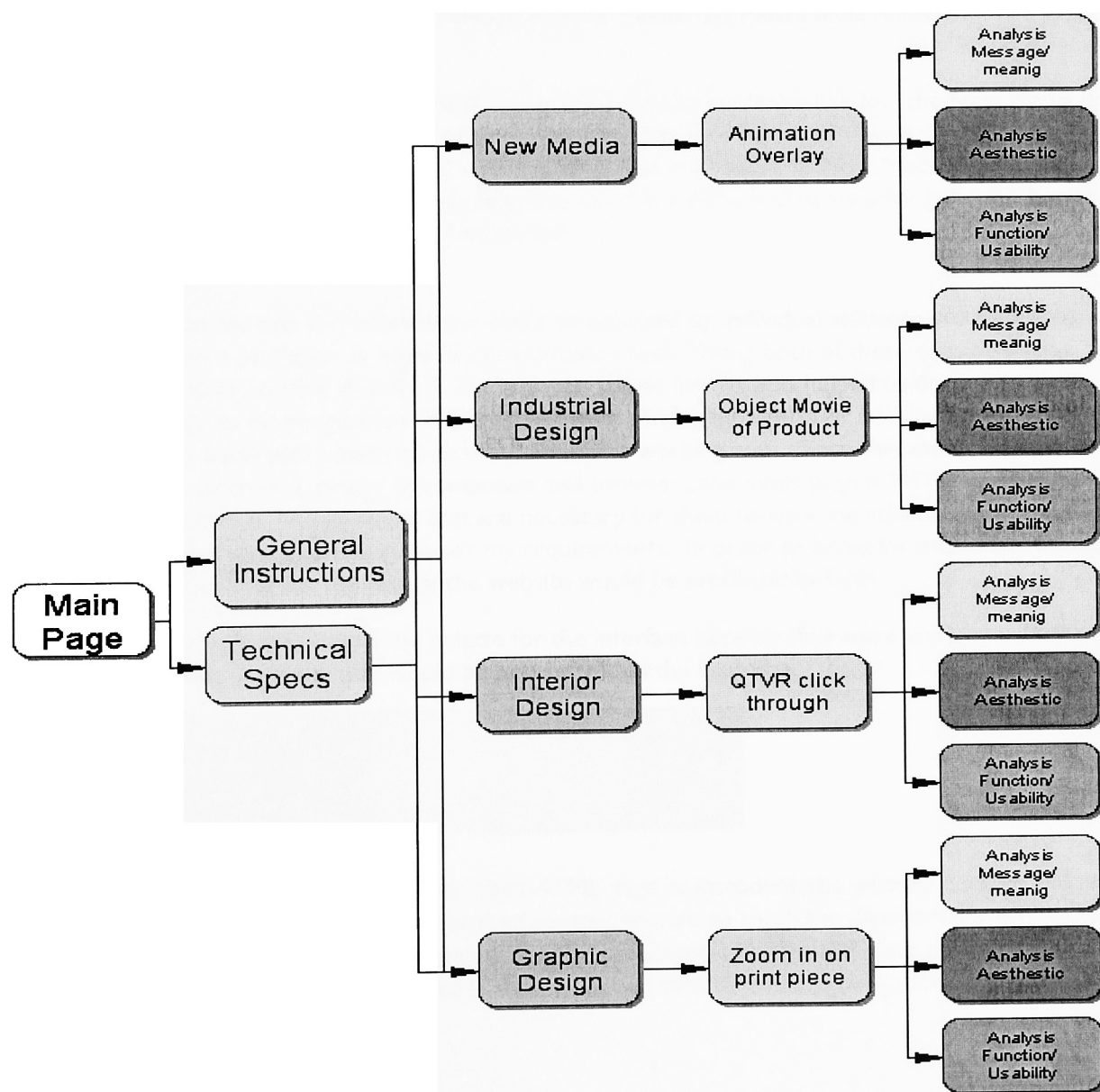
Brainstorming

Since relevance was one of the areas students were having trouble with, the first step was to set up meetings with a professor from the New Media, Industrial Design, Interior Design and Graphic Design departments. The intent of involving this many individuals was to make sure that the content included was pertinent to what they cover within their programs. Ideally it would also lead to student work that

could be used as the example piece. In order to make the concepts more applicable to the students chosen field, examples of student work and information from within their major would be utilized to illustrate the theoretical concepts. This way it takes the concepts out of the theoretical arena and applies them to concrete work that has been designed by someone of similar experience to solve a problem assigned by a familiar professor.

At this point I had developed the initial flow chart so that the concept could be presented to each of the professors as a starting point for the project.

Therese Hannigan from the New Media Department is the first professor with whom I met. She was interested in the project and supportive of the idea of using work from a student within the New Media Department to illustrate the concepts of the lesson. At this time I was not sure how this was going to work but she was excited about the possibilities.



I met with Nancy Chwiecko from the Interior Design, Stan Rickel from Industrial Design and Deborah Beardslee from Graphic Design. Between the student survey and the meetings with professors, I concluded that the content of the website should be broken up by department. This would enable students to first explore content in relation to a field in which they felt comfortable, and then to build on that understanding by seeing how those theoretical concepts are applied in other fields.

Some individuals were more interested than others, but what became clear was that there were too many people involved in a project that I had too little time to complete. After a meeting with my committee I decided the best way to narrow my content was to pick one program and follow that particular program through to completion. This would solve the problems of my proposal and keep the project within a reasonable scope.

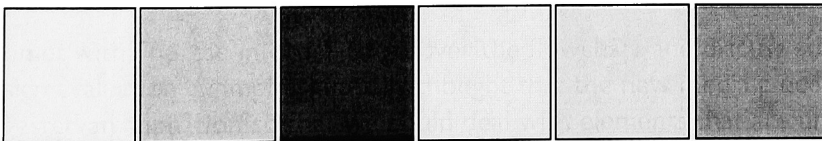
I selected New Media for three reasons: (1) The professor was interested in the project and willing to participate. (2) New Media is the newest of the design fields and there are not a lot of support materials that address design theory in direct relation to New Media. (3) New Media is also the field that most closely reflects my interests.

I met with Therese in order to go over the flowchart and discuss student work for the New Media design evaluation example. I initially thought that the new media piece would be a web site. Therese suggested an animation so that we could deal with elements that are unique to New Media such as time and motion. I thought that this was an excellent idea but had a difficult time visualizing the mechanics of designing an interactive evaluation of an animation.

Design

It was important to me that this information could be accessed by individual students in a large lecture course as well as by a professor in need of a presentation tool. Taking both of these considerations into account the most sensible delivery is the Internet. These factors also helped to determine that the website needed to be designed so that it could be viewed from a laptop or a projector. Therefore 800 x 600 was the maximum screen resolution I would be working with. Since this website would be accessed by students from a variety of computers and browsers, the initial page is HTML and has all of the plug-ins and browser requirements that are necessary for them to view the information. The RIT Online Learning site was used as a guide for my requirements. In order to allow for maximum interaction and flexibility of content, the rest of the website would be produced in Flash.

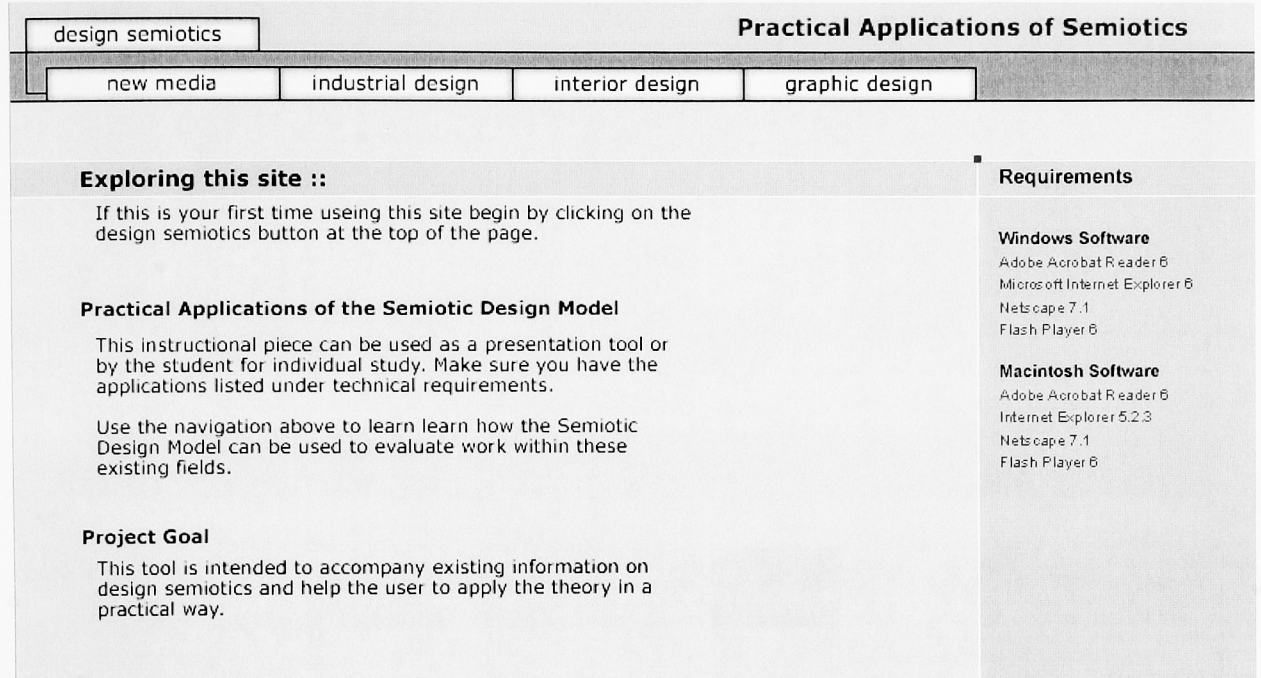
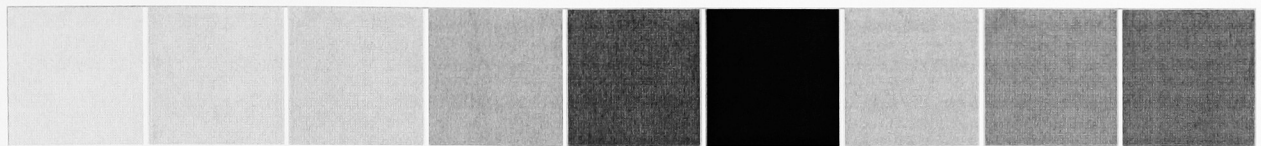
I initially chose the colors below as the palette for the interface because they were complimentary and did not detract from the work that would be housed within the interface.



After selecting these colors I designed the initial HTML page to introduce the website content and provide plug – in information. In the navigational structure I wanted to show the departments within the website; New Media, Industrial Design, Interior Design and Graphic Design, and their direct relationship to Design Semiotics both theoretically and within the actual structure of the navigation.

design semiotics					
	new media	industrial design	interior design	graphic design	technical requirements
<p>Practical Applications of the Semiotic Design Model</p> <p>This Instructional piece can be used as a presentation tool or by the student for Individual study. Make sure you have the applications listed under technical requirements.</p> <p>Use the navigation above to learn how the Semiotic Design Model can be used to evaluate work within these existing fields.</p> <p>Project Goal</p> <p>This tool is intended to accompany existing information on design semiotics and help the user to apply the theory in a practical way.</p> <p>Exploring this site</p> <p>If this is your first time using this site begin by clicking on the design semiotics button at the top of the page.</p>					<p>Windows Software</p> <p>Adobe Acrobat Reader 6 Microsoft Internet Explorer 6 Netscape 7.1 Flash Player 6</p> <p>Macintosh Software</p> <p>Adobe Acrobat Reader 6 Internet Explorer 5.2.3 Netscape 7.1 Flash Player 6</p>

My committee helped me identify revisions that would get me closer to my final design. At this point, I revised the copy by moving the instructions from the top of the page to the bottom. The color scheme was modified so that it is based off of the same RGB model that the Semiotics Chart uses for its analogy. This way the colors make sense not only aesthetically but also tie in to the project on another level. My committee also advised to reduce "Technology Requirements" to "Requirements" and delete it from the main navigation. This was an important change because my initial concept put too much emphasis on "Technology Requirements." By pulling that out of the main navigation it helped reach my goal of making the navigation both functional and illustrative of the more broad design concepts.



Now that the color scheme and navigational conventions were established, I could move on and begin work on the secondary level of the website.

The secondary level is where the student interacts with the animation and views the overlaying analysis. I wanted to keep the navigation visible at all times so that the student could continue to reinforce their understanding of how all of the concepts relate to each other. This is also where color-coding really came into play. Each of the types of evaluation; aesthetic, meaning and usability have a color assigned to them which also directly relates to the semiotic chart at the bottom of the page. The chart at the bottom the page changes depending on which type of evaluation is selected. For example if "Aesthetic" is selected in the navigation, the "Syntactic" section of the chart will come to the forefront accompanied by the definition. This helps the user learn the definitions for the more traditional terms after being introduced to the overall concepts by their more common counterparts. At this point, I was not sure how I was going to illustrate the evaluative statements, but I did know that the color coding approach was going to be essential in both organizing the information and reinforcing vocabulary throughout the website.

design semiotics	Practical Applications of Semiotics				
	new media	industrial design	interior design	graphic design	requirements
	aesthetic	meaning	usability		

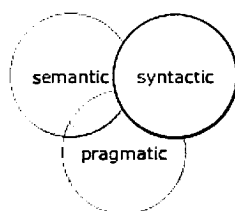
design semiotics | new media | aesthetic

Area for animation evaluation.

☐ All copy in relation to aesthetic will use this color.

☐ All copy in relation to meaning will use this color.

☒ All copy in relation to usability will use this color.



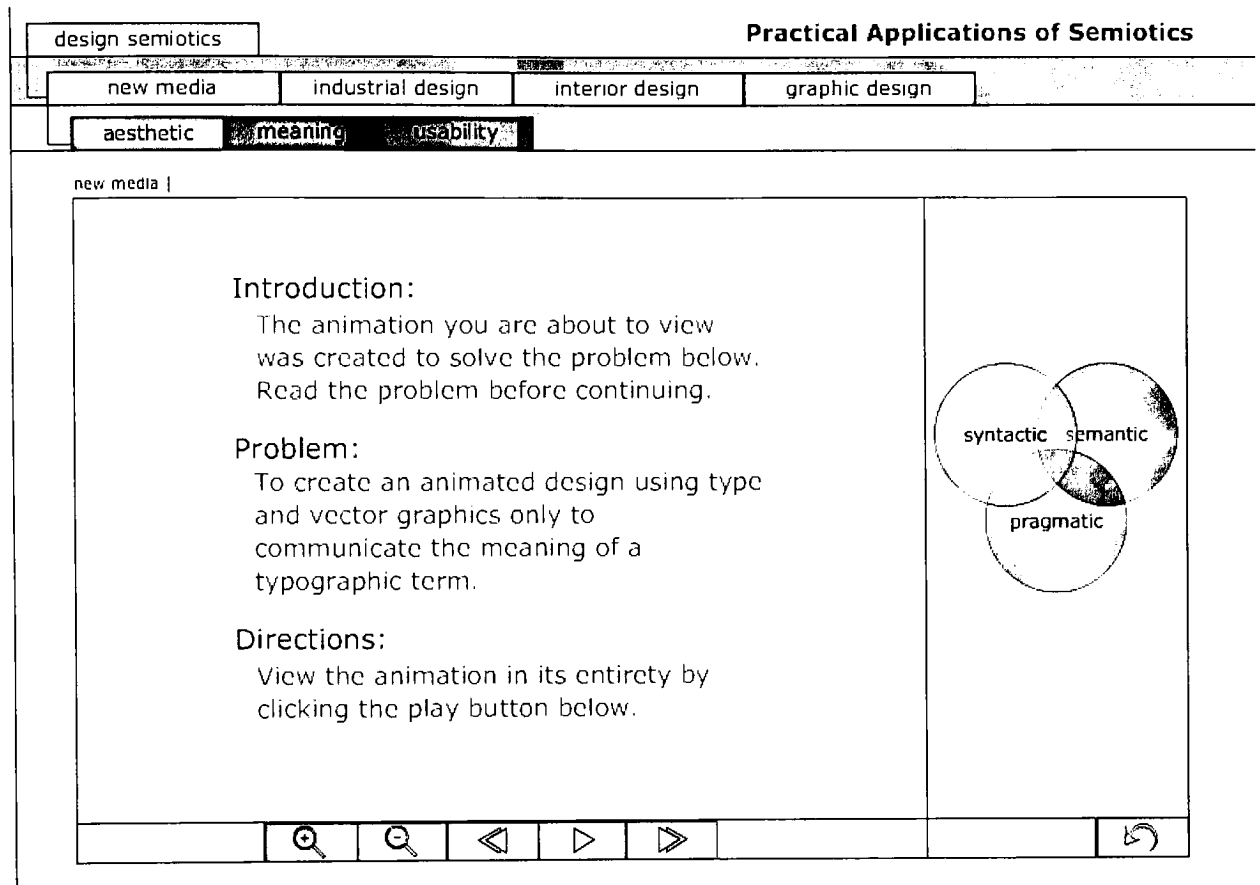
Refers to the relationship of one visual image to another.

At this point in the design process I received the student animation to which I would be applying the different stages of analysis. This led to many revisions, the animation itself was smaller than I anticipated at 550 by 400 pixels. The smaller size freed up more space to the right of the evaluation area and allowed me to move the chart up and to the right of where the animation would be playing. This is much better from a usability standpoint because we read from left to right and it makes it easier for the individual using the website to look at the chart than if they had to continuously refer to the bottom of the page. When the chart was moved to the right the circles within the chart were also re-ordered so that they mirrored the navigation. This type of consistency is crucial to the explanation of the theoretical concepts. Repetition and consistency help students learn the information without making them memorize a list.

As I prepared Brian Emling's work to be loaded within the instructional interface I discovered that animation was designed so that it played through different scenes. This made it impossible to control the playback through my interface. After some exploration and testing I discovered that in order for me to be able to control the sound and animation with video style controls, I would need to restructure the animation so that it was all on one timeline without altering the students animation.

Once the animation was in a sequential format I was able to start coding the Fast Forward, Rewind, Play, Pause, Zoom In and Zoom Out buttons. I designed the icons for the video control buttons in Illustrator and then brought them directly into Flash. This way all of the buttons share the same button

instance with a different icon. This saves on file size and keep the graphics consistent. After all of these modifications were made the second level interface had reached its final version.



After viewing the animation within the interface I decided that the user should have the same control for the aesthetic, meaning and usability analysis sections. Initially I had planned for it to be more of a self-timed animation with comments. This approach would not have been effective. The website needed to work for people that read at different rates and for both students and professors. Therefore user - centered design was going to be very important.

Copy

These concerns over user control lead me to prepare each analysis section as a separate SWF file. This also gave me the freedom to intersperse instructional text particular to that file. Therefore the instructions could be specific and brief. I did not want to overwhelm the user with too much information at any one time. This approach was also important because it included information at different points in the presentation so that if someone went through in a nonlinear fashion they would not get lost.

During the interface design process I had also started to receive the evaluative statements from Professor Hannigan that were going to be inserted as pop – ups on the different analysis sections. I began the editing process with the aesthetic evaluative statements by assembling a chart with Therese's original comments on the left and the revised comments on the right. I went through this process in order to make the comments appropriate for their delivery format. They needed to be edited down without losing their meaning. After revising the comments I sent them back to Therese for her approval. Once the aesthetic comments were approved I followed the same process for the meaning and usability

statements. It was very important to get all of the statements approved before including them into the SWF files. This process made it possible for me to avoid making numerous text changes within Flash.

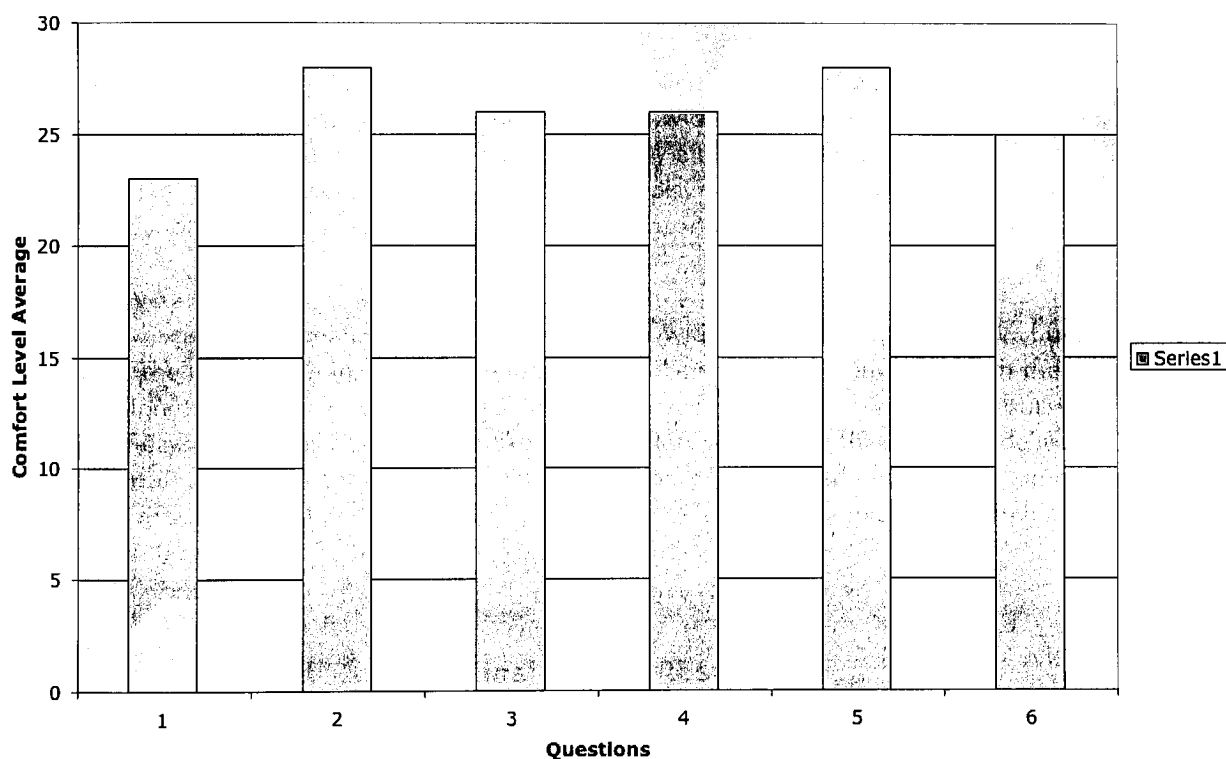
Syntactic - Aesthetic / Form	
Revised Copy	Original Copy
The margins are well defined.	- the aspect ratio is well designed (gives room left to right and top to bottom for animation)
A longer pause on the white space would have set up the animation better.	- there should be a slightly longer pause before the animation begins
	- give the viewer a chance to see the blank white area before the "i-beam" enters the scene
Animation building from left to right builds on established typing convention.	- the text coming in on the top left works because that's how we traditionally start typing
It also allows the character to enter at the center of the composition.	- it also leaves room for the character to come in toward center
The contrast of black and white helps recognition of moving characters.	- the black works well for the dingbats because of the contrast (recognize moving characters)
Yellow color choice helps establish main character's dominance.	- it also makes the yellow pop out more so that our character has dominance
The leading needs to be adjusted because of the capital letters.	- the leading needs to be adjusted in the first text block because of the capital letters
There should be a better "grouping and nesting" of type for this sequence.	- there should be a better "grouping and nesting" of type for that sequence
This font is very legible because of the large counterreform.	- font selection works well on screen because of the large counterforms (legibility)
Sans serif typeface lends itself to the animation's mood without hurting legibility.	- the sans serif typeface lends itself to the mood of the animation without hurting legibility
	- the larger size of the text is appropriate for "on-screen" and is good for quick scanning
Orange text is legible and grabs attention.	- the orange color works for the text because it's legible and grabs attention
The color is consistent with the theme without competing with the main character.	- it sets the right mood without competing too much with the main character
Negative space helps focus the on the text and the main character.	- there is an appropriate amount of negative space to let you follow the text and character
There isn't a strong presence of a grid structure, however the floor and ceiling create a loose infrastructure.	- there isn't a strong presence of a grid structure
	- however - a gray area appears for a lower and upper plane (floor/ceiling are the same)
Space is used well, the animation looks continuous.	- the frames are used well - it is not all self contained - things look to be continuous
There is repetition of content without redundancy.	- there is a lot of repetition throughout the piece without any aspect becoming redundant
	- the gray area, the type size and color, the use of caps for emphasis
	- the use of a dingbat both in a visual form (humor) as well as typographic (practical)

Once the statements were placed into their pop – ups and added to the animation I had another committee meeting. After viewing the aesthetic comments within the interface they made a suggestion to add some type of visual cue to tell the user to click play after they have read the statement. I revised the movies so that after every statement pops up, the play button pulses the color that is associated with that section until it is pressed. It is a helpful indicator that moves the lesson along.

Final Survey

Once the website was completed it was time to test it with my original focus group. I used the same students as the first survey in order to reduce the number of variables involved with the results. The online version of the survey turned out to be worth the extra work. I received the survey results in a matter of days instead of weeks. I also like the complete anonymity that Internet delivery provides the focus group. Overall I am happy with the results, there is a marked improvement in both comprehension of vocabulary and understanding how the type of evaluation you are performing can affect the outcome of the analysis.

Final Survey Results



Further Development

Time was a limiting factor in determining how much of my thesis project was developed through to completion. Therefore, I would like to include in my documentation how I envisioned this project being carried out.

In the fully developed final version, each of the design departments would have a student example. That example would be representative of the unique challenges designers face specific to that field. For New Media these were time and motion. For Industrial design they may be usability and form. The design issues would be defined by the professor representing that department.

Each department's evaluation example on the website would be executed in the media that allowed for the most immersive design evaluation simulation possible.

Industrial Design: A three-dimensional object or product.

The object could either be photographed, or if it were a prototype developed as a three-dimensional model it would be exported as a series of images. Either way, the images would be assembled in to a QTVR object movie. The object would be the basis for the analysis. Depending on what section of the website the user is in, that section's evaluative statements would become visible as they rotated the object movie.

Interior Design: An interior space.

The interior design space could also be either photographed or a three-dimensional representation of a space. This department's evaluation section would be illustrated by a QTVR walkthrough of the interior space. As the user progressed through the space, the evaluative statements would appear. This would be a much more interactive representation of an interior space than is possible with traditional media.

Graphic Design: Information architecture in a printed piece.

The Graphic design example would employ the "magnifying glass" effect that is created in Flash. This would make it possible to see more of the representative piece even though there is not a lot of screen real estate to work with. It would also allow the user to zoom in on evaluative statements and the design choices they are referring to.

Conclusion

Instructional design is still a fairly new field that is finding its place in the academic landscape. My thesis project explores one way instructional design could be used in the future to help professors deliver and students retain theoretical information that is sometimes difficult to get across in a large lecture class environment.

Resources

Online Documentation

Getting Started with e-Learning Standards: Macromedia, Inc.

<<http://www.macromedia.com/resources/elearning/>>

This document is a concise listing of important e-Learning organizations and standards. It also gives a quick explanation of why the technologies that are listed are the current standards.

Instructional Design & Learning Theory: Educational Communications and Technology: Brenda Mergel. May, 1998: University of Saskatchewan. <<http://www.usask.ca/education/coursework/802papers/mergel/brenda.htm>>.

The Basics of the Learning Theories including Behaviorism, Cognitivism and Constructivism. This article also goes into a brief history of learning theories in Instructional Design. It is a useful study of what has worked in the past and how that information can be integrated with the technology of today.

Macromedia MX Strategies and Architectures for e-Learning Content:

Tanya Heins and Frances Himes. September 2002: Macromedia, Inc.

< [http://](http://www.macromedia.com/resources/elearning/)

www.macromedia.com/resources/elearning/>.

This document describes development strategies and the respective Macromedia technology. It also goes through a learning object demo application that can be used as a developer model. Efficiency and flexibility of content viewing are the focus throughout this article.

Using the Web for Interactive Learning and Teaching The Imperative for the New Millennium: Pat Brogan. < <http://www.macromedia.com/resources/elearning/>>

This article begins with an interesting analysis of today's economy and how instructional media can be used to meet the needs of a changing society. Instructional design's flexibility and capability of incorporating a variety of media are also discussed. Learning theories and how they relate to the future of Interactive Teaching and learning are also explored.

Books

Jeffrey Bardzell. Macromedia MX e-Learning Advanced Training From the Source.

Macromedia Press, 2003.

A step by step guide for building interactive learning applications using Dreamweaver MX, Flash MX and Coldfusion MX.

Patricia L. Rogers. Designing Instruction for Technology-Enhanced Learning.

Idea Group Publishing, 2002.

This book has a nice case study approach to technology-enhanced learning. It goes through the theory and background of the subject but is also illustrated with actual examples of each stage of an instructional design project. It also divides designing for Primary and Higher education in to two separate sections.

Useful Sites

Macromedia

<http://www.macromedia.com/>

Instructional Design

<http://www.instructionaldesign.com/>

Interaction Design: Beyond Human Computer Interaction

<http://www.id-book.com/>

Practical Applications of Design Semiotics
Master of Fine Arts



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