VIS-ABLE: A VISUAL RESEARCH GALLERY TO PROVIDE INSPIRATION FOR BEAUTIFUL (AND THEREFORE USABLE) OBJECTS

Cathy GRUNDY[1] **and Andrew BLAKE**[2]
[1]University of Sussex, Department of Engineering and Design
[2]University of Brighton, Department of Computing, Mathematics and Information Sciences.

ABSTRACT
This paper describes an important stage in the development of an on-line Visual Research Gallery, known as VIS-able. The web site is intended to inspire creative solutions across a range of design disciplines, though it has its roots in Product Design Education. The content explores the theme of 'beauty' and its role in improving usability and the experience of using objects.
Particular elements of the web site content can be downloaded and used as a teaching resource for the classroom; they take the form of a series of self-contained Flash movies that introduce practical considerations when designing interaction. The following describes the use and subsequent evaluation of these components. The movies were used within the Creativity Zone at the University of Sussex to create an interactive learning experience for second year Product Design BSc students. The students were subsequently asked to use the principles to design a series of products and also to evaluate how useful they found this way of learning. The net result was that the students found the experience helpful in forwarding their understanding and the principles were effectively and creatively utilized in project work. The tutor and the student's peers evaluated success. Interestingly the students also commented that because their work might be part of a shared experience and also published on the net, this inspired them to work harder.
The project has been facilitated through a research award provided by InQbate, a Centre of Excellence in Teaching and Learning focussed on Creativity. Although the resultant Gallery has provided a useful teaching aid for a variety of design undergraduates, it is intended that the tool will also, in the future, be an eclectic source of ideas to all who share in it, including product design practitioners.

Keywords: Usability, visual research, interaction design

1 INTRODUCTION

Figure 1. The Creativity Zone at the University of Sussex used for a brainstorming session

This paper describes the use and analysis of a particular set of learning tools (interactive Flash movies) created for the VIS-able web site. They were used and evaluated during a course taught at the University of Sussex, within the Creativity Zone, called 'Advanced Studies in Colour and Texture'.

The module content includes the study of Perception and Communication and its impact on 3D form. The teaching space is an ideal environment to try out new interactive learning experiences. Its specification includes: a flexible layout with walls that can be moved to suit the activity, 7 plasma screens with interaction points and projectors that magnify the material that students or teachers interact with on to the walls. The Zone is shown in Figure 1. However, before continuing with the details of this 'experiment', it is ideal to describe more about the context for the interactive movies, i.e. the web site and its creation. The project, as a whole, celebrates connections between art and technology explored through the discipline of design. The subject matter combines techniques and theories, usually used for visual communication or aesthetics and illustrates how they can help to meet usability goals. It has been shown that interface designs that are aesthetically pleasing are usually perceived as easier to use by onlookers. [1] The examples cited are from art, product design, design history, cultural studies, architecture, graphic design, interaction design and the media; however the project also encompasses hci principles, traditionally associated with more scientific approaches. The outcome is a web-based production, which allows continued contribution from students, staff and members of the design community. As students learn from the visual research gallery, they are enabled to create further examples of design during their course that help to illustrate the points being made thus the production is kept up to date and should prove sustainable. So far, the project has included examples created from product design and web design disciplines based at the University of Brighton, in addition to product design students at the University of Sussex. MA computer games students and information product design BSc students at the University of Westminster were also involved in the evolution of the web site. Industrial practitioners also provide case histories.

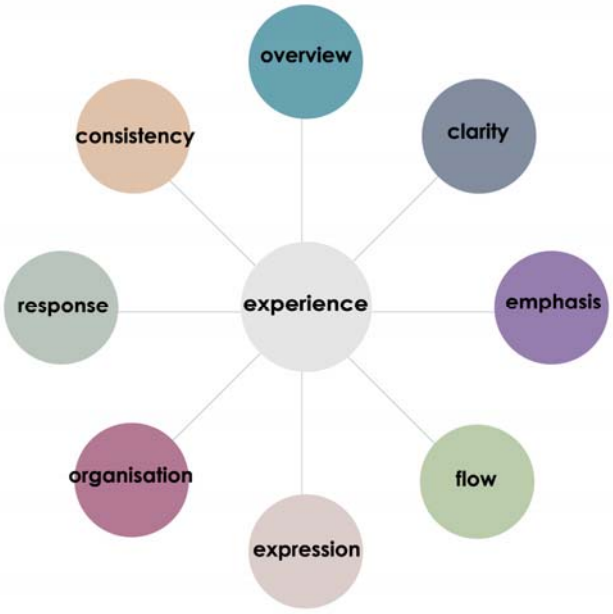

Figure 2. The wheel of Interaction Goals for a Product Interface

The research activity builds on work already conducted with the University of Westminster. The author successfully completed a Knowledge Transfer Partnership with the institution and PDD Ltd., a London based Innovation and Design Research consultancy, based on improving User Experiences. In an experiment, we used a set of Interaction Goals, and considered them from the perspective of improving the emotional responses to an interface. They were evolved from the work of design gurus like Donald Norman [1] and Jakob Nielsen [2], but combined artistic aims like the need to create 'Emphasis' [3] In this initial scheme, the students noted that the Interaction Goals had structured and inspired their project work. The principles form the basic structure of the VIS-able web site and are featured in the Wheel of Interaction Goals shown in Figure 2.

2 AIMS AND OBJECTIVES

The following describes the aims and objectives of the project as a whole in more detail:

2.1 Teaching and Learning: to broaden the student's perspective and encourage a sense of participation and community.

The project is intended to encourage students to take a broad perspective when seeking inspirational material. Material will be sought from Artists, Multimedia and other design disciplines, thus also providing an ideal opportunity to create positive links with the practicing community. Students will also be encouraged to work together and critique examples to be added to the production.

2.2 To increase motivation and allow learning at the students pace:

The production is intended to promote individual exploration of ideas, encouraging a constructivist approach to learning through visual research and solving design problems. The students own visual research and practical design work will provide new material to keep the collection current, making it sustainable. The project also allows exploration of the educational benefits of an interactive approach to theoretical ideas allowing a larger volume of inspirational material to be available, when required.

2.3 To encourage understanding of current practice:

The resource will be further developed by collaboration with a range of industrial practitioners, thus encouraging a network of contributors to the project. The partnership organizations, including DCA design, will provide an insight into current practice and keep the production relevant to industrial activity. Using case histories, the production is intended to make design theories come to life by demonstrating their practical use.

3 METHOD

The structure of the web site relates to the Interaction Goals defined and (after a general introduction) a set of links provides more information about them. For each category, a downloadable Flash movie describes some possible techniques for achieving the goal and a gallery of examples provides visual research material illustrating how some people have used the techniques.

Over the duration of the Advanced Studies in Colour and Texture course, taught at Sussex University, lectures were given to introduce the Interaction Goals and then the creativity space was used to allow students to investigate the interactive Flash movies to understand more about the principles involved. The aim here was to test out and get feedback about these movies in an interactive environment. Although ordinarily the movies might be viewed independently by students at their own pace, the Creativity Space allowed me to gather students together to discuss the contents and get direct feedback about their learning potential and nature. After the class a questionnaire was distributed to discover whether students felt that the videos had helped them to understand the theories and if the contents were clear. There were 25 students, studying for their second year of a Product Design BSc; they had an hour to interact with the videos and to reinforce their learning they filled out a 'Quiz' that asked them pertinent questions about the content. The following evaluation questionnaire asked questions to find out if they considered this kind of learning more informative, and more fun judged against their usual experience of sitting through a lecture on theoretical material for similar subject matter. The majority of students did find the videos stimulating and were able to answer all the questions given, or to find out more information in a self motivated manner to ensure they could answer the 'quiz'. They also said that it was easier to pay attention when they were guiding themselves through the material.

For the sake of brevity, we will focus on the communication of the first two interaction goals, which are: the need to achieve 'Clarity' and also how to create a hierarchy with techniques that introduce 'Emphasis'. **However a summary of all the Interaction goals for designing usable objects can briefly be defined as follows:**

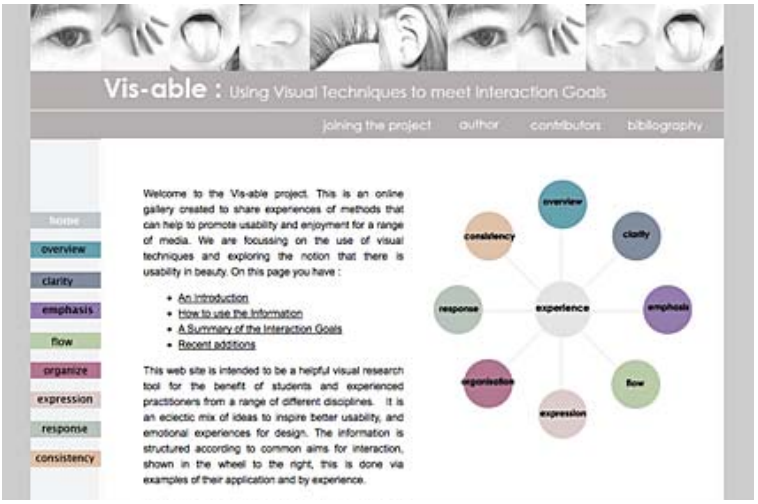

Figure 3. A screen shot of the VIS-able web site

3.1 Clarity

How do we make an object or an interface clear and readable? This can be described as an aim to create 'clarity' in its form and purpose. Creating an object that presents the user with a clear and uncluttered interface is a commonly cited design goal. Often the key to an elegant design is to avoid over-loading our sensory mechanisms. Attractive objects often obey simple aesthetic laws about optimizing our cognitive load. It is possible that these laws can also help us to simplify an object to make it potentially more usable and readable [6]. Figure 4 illustrates the first screen of the Flash movie summarizing the techniques that can help to improve Clarity.

3.2 Emphasis

Sometimes we simply want to an item in a composition stand out. It may be that we wish to design an object that is particularly striking in a general environment, or to make particular elements of an interface more prominent. It is vital to be able to find the part of an interface or artifact that is most important to us. An obvious example is perhaps making an emergency stop button on a product stand out. It is also very useful when beginning any process of interaction, to know where to start. Artists use a technique called creating 'emphasis' to lead the eye to important parts of a picture or sculpture. Those that study communication are primed to create Visual Hierarchies, by increasing 'Visual Weight' and use other methods to create a focal point for the eye.

Figure 4. Screen shot of 'Clarity' Flash movie

Figure 5. Screen shot of Flash movie introducing ideas for Emphasis

Other Interaction Goals can be summarized as follows:

3.3 Flow

In order to increase our level of engagement with any activity, it has been shown that having a sense of flow is important. When we are involved with painting, for example, or a process where we feel immersed in the event, time can pass quickly and we can be quite efficient and productive.

3.4 Expression

How can we make an artifact expressive of its meaning and function? Most design gurus agree that the available functions and uses of an interface should be made 'visible', and that a device or object should be explicit through its form and meaning.

3.5 Organization

How can we distribute information so that we can quickly and easily assimilate it? We need to visually categorize items on any interface so that they match up with the mental model that we have for understanding their purpose.

3.6 Response

Does the system interact and respond to the viewer appropriately or interestingly? User engagement is encouraged by an ability to interact flexibly with a system. It is also important that the system 'replies' or tells the user what they have achieved.

3.7 Consistency

It is important that our world-view remains consistent. If items that we need to interact with keep moving around on an interface, this can cause much confusion. We also need to consider consistency with our own expectations of a device.

4 PROJECT RESULTS

The project work created by the students exemplified the techniques in a variety of ways. For example, after the principle of Clarity had been introduced, and the techniques demonstrated in the Flash Movies, students were asked to re-design a microwave interface and in a different project create a novel radiator that expressed the idea of heat but was aesthetically pleasing. Figure 6 illustrates two of the project outcomes. The students effectively adopted the principle of Unity and other aesthetic principles and appeared, on the whole to see the connection between aesthetic clarity and readable interfaces. The students were also asked to create a 'Striking object' in the form of a piece of furniture. Some examples are given in Figure 7.

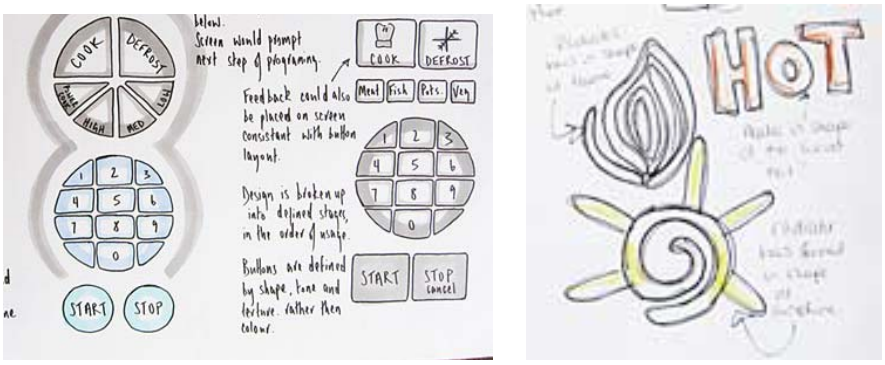

Figure 6. On the left, a microwave interface designed by Anna Dugard, on the right a radiator designed by Cassie Jones. They both exhibit the property of creating Unity.

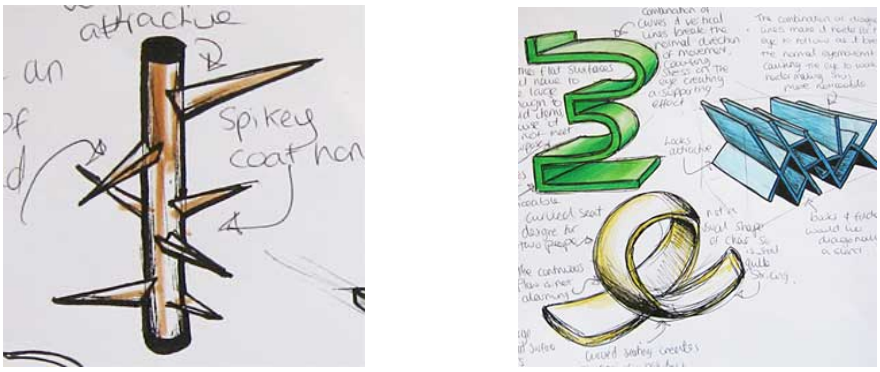

Figure 7. The use of memory invoking forms and diagonal / curved visual elements are used in these examples of 'striking' furniture design created by Cassie Jones.

5 CONCLUSIONS

The student work appeared, on the whole to exhibit an understanding of many of the techniques introduced to create objects that met the goals under discussion. In peer reviews the students were generally supportive of the success that others had had with the application of ideas. Through their questionnaires, the students commented that they would like to see more examples to illustrate the subject matter being covered. The plan for the web site is to attach a gallery to each goal for exactly that reason, thus it appeared that the student comment inadvertently justified continuing with the effort involved with gathering the examples for visual research. The students also commented that the navigation could be clearer and perhaps more diverse, this was taken into consideration with the redesign and also an effort was made to clarify any of the points that were not clear from the descriptions. On the whole, however, the students found the experience a stimulating way to learn and appreciated the fact that they could download these nuggets of information for later use. They were also thrilled that their work might appear on the web site and worked harder to achieve good results.

REFERENCES

[1] Masaaki Kurosu and Kaori Kashimura, *CHI 95 Conference Companion*, 1995 p 292-293.
[2] Norman, Donald, *The Psychology of Everyday Things*, New York, Basic Books, 1988.
[2] Nielsen, Jakob, *Designing Web Usability: The practice of simplicity*, USA, Wiley, 2000.
[3] C.Grundy, A.Blake, 2006, Go with the Flow or Seize Control? Interaction Principles to make interfaces enjoyable. *IT Interfaces Conference, Dubrovnik June 21-23rd 2006.*
[4] Jordan, P., Pleasure in Product Use, beyond usability *Contemporary Ergonomics*, 2000.
[5] Sanders, E, Postdesign and Participatory Culture, *Useful and Critical: the position of Research in Design*, University of Art and Design, Helsinki,1999.
[6] Justice, Lorraine, Getting Emotional with..Lorraine Justice, 2008, http://www.designandemotion.org/society/conference/interview_lorraine_justice.html
[7] Overbeeke & Wensveen, S. Beauty in use. *Human-Computer Interaction, 19*, 367-369, 2004.
[8] Butler, Jill, Universal Principles of Design: *100 Ways to Enhance Usability*, Rockport Publishers Inc., 2007.