DESIGN EDUCATION: OUT OF THE STUDIO AND INTO THE RESEARCH LAB

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ABSTRACT

Design education, by broad definition, is the instruction of theory and application in the creation of products, services, and communications. More specific to Visual Communication Design, is the teaching of typography, composition, cultural awareness, and audience understanding. By taking students beyond the design studio, and into a formalized design research lab, we are providing them with a much richer educational experience, and in turn, making them more marketable to future employers. Realizing this knowledge is a valuable commodity in industry, the VCD program at Virginia Tech is recreating itself to include coursework and design research that moves out of the studio. A new lab- ETUT (Eye Tracking and Usability Testing Lab) has been established within the School of Visual Arts, to assist in this redefinition. Once students complete studio projects, they are then guided through a series of methodologies, which test the validity, and integrity of their designs using the equipment contained in the ETUT lab. Their design education is being augmented with hard science to create a truly unique designer.

INTRODUCTION

Formal Art & Design Education (A/DE) can be traced back to the United Kingdom where it bears the distinction as being “the oldest form of publicly funded education,” (Bird) A/DE was begun to meet the needs of trained ‘artisans.’ These ‘artisans’ are the nineteenth century equivalent of todays designers. From the start A/DE maintained a strong emphasis on practice and was defined as “…the link between the historical training of the artisan and the current education of the artist, designer and craftsperson.” [2] With this emphasis, many Schools of Art & Design operated independently and did not see a need to parallel themselves with their academic counterparts. Because of this, A/DE curriculums initially failed to attain academic degree status for their offerings. This trend continued in the UK until the late 1960’s when

formal degree status was granted to A/DE disciplines, and has similarly influenced design education in the US.

As a relatively fledgling discipline, and few graduate programs, many A/DE programs across the UK and US have tended to focus on undergraduate provisions and preparing professional designers. With the (somewhat) recent introduction of PhD's in design research (only four currently exist in the US) only now do we see A/DE programs beginning to incorporate more research, theory, and methods into the undergraduate education in hopes to prepare students for graduate education in a design related discipline. Design research is becoming more prevalent in undergraduate curriculums. These design methodologies are gaining additional importance as the resulting methodologies help validate the design discipline. Bruce Archer states, "Design research is systematic inquiry whose goal is knowledge of, or in, the embodiment of configuration, composition, structure, purpose, value, and meaning in man-made things and systems." [4]

This paper presents an undergraduate design studio methodology incorporating Activity Theory and usability testing as theories and techniques to test design decisions and further validate the final design solution. By fusing more scientific research with design solutions the author hopes to further substantiate A/DE and the discipline as a whole.

ACTIVITY THEORY

Activity Theory is based in part on the work of Vygotsky, Leont'ev, and has been expanded upon by Yro Engström. In essence, activity theory states that human beings interact with their environment via situations mediated by tools. Through mediation these situations create experiences. "This notion is usually portrayed by what has come to be known as the mediation model of human interactions with the environment." [5]

Leont'ev developed Vygotsky's initial theory further by providing links between social and cultural mediations, resulting in a hierarchical model of human activity.

Engström drew upon both Vygotsky and Leont'ev's models of human interaction activity by expanding them to encompass rules, community, and the division of labor. This resulting model has come to be known as the Activity Triangle Model. (Figure 1) [3]

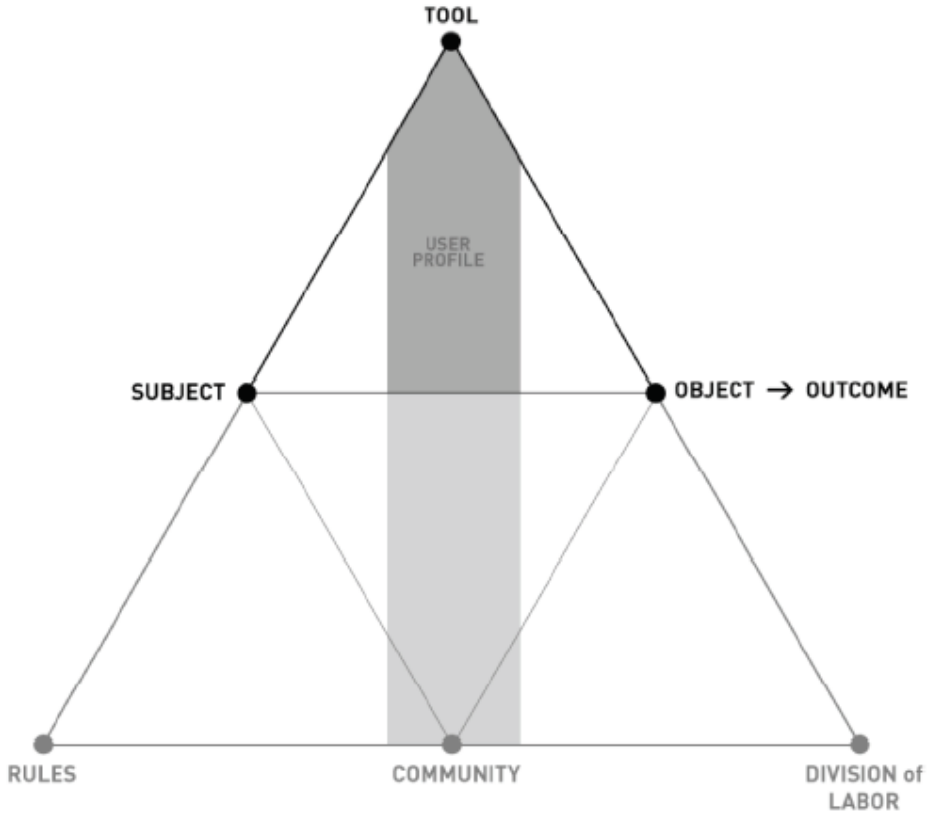

Figure 1: The Activity Theory Triangular Model

Components of Activity Theory

Activity theory divides an activity of interest into seven components:

1. The Activity
2. The Tool
3. The Subject
4. The Object
5. The Rules
6. The Community
7. The Division of labor

Subject describes the user who is enacting the activity, and the object is the motivation or intended outcome of the enactment. The tool, is situated between the subject (user) and the Object (outcome). It is the device, in this case, a e-commerce website, through which the activity is implemented. The tool facilitates the efforts of the user to achieve the desired outcome. The rules component mediates the activity; as does any culture, pattern, gender, society, or any other factor that imposes any rules on this interaction.

Community refers to the environment in which the activity is completed, and finally, the rules of labor divide existing roles of in the activity (if necessary). It has the effect of assigning duties to those responsible for completion of each task as well as the division of a larger activity into tasks (if necessary).

DESIGN METHODOLOGY

This A/DE pedagogical method was utilized in an undergraduate Visual Communication Design studio course taught at the intermediate level, students are in their second year (of three). The VCD program at Virginia Tech falls under restricted status, and students in the program must pass a rigorous portfolio review prior to being issued an invitation to major in VCD.

Components of Studio Problem

1. Assign design brief
2. Presentation on Activity Theory
3. Presentation of usability testing methodology
4. Students design, test & compile data
5. Students present results
6. Iterate design if necessary
7. Turn in project w/ process materials

Students are presented with a design brief (studio problem) which details the problem: to create wireframe templates of a website for a large on-line corporate retailer, and provide initial usability testing results of their final design solution. Also at this stage, students are introduced to the Human-Testing mandate (IRB) at Virginia Tech and must become IRB certified before continuing with the project.

The Activity Triangle Model is introduced to the students as a scientific theory and framework for their design exploration. They begin to understand the subject becomes the user, the tool becomes the interface, and the outcome becomes a successful interaction with the website (system). While this studio problem only deals with the top of the Activity Triangle Model, students are also exposed to the remaining variables and the relationship the play with the subject, tool, and outcome. Students are also introduced to the PUT-Q2 (Perceived Usability Testing Incorporating Quantitative and Qualitative data) usability testing methodology created by the author. [1]

Students then sketch, iterate, and design the wireframes for the pseudo-client. Since students are all IRB approved, they then move their designs into the Eye Tracking and Usability Perception Lab (E-TUT) for usability testing.

Once students complete studio projects, they are then guided through a series of usability testing methodologies (PUT-Q2) that measure the validity and integrity of their designs using the equipment contained in the ETUT lab. They are exposed to a hi-tech eye tracking system created by SMI, usually reserved for larger corporations that specialize in usability testing, while still an undergrad. They begin to see the connection between design, research, and execution.

Students define areas of interest (AOI's) within their wireframes to establish levels of viewed hierarchy. (See Figure 2) By utilizing this method, students will uncover what areas subjects are viewing and dwelling on, as well as the order in which these areas are seen. At this time, students also state their hypothesis for testing. For example, one hypothesis (H1) may be that since three levels of navigationexist, users will miss at least one.

Figure 2: Areas of Interest (AOI's) Defined and placed on a grid

Students then use their selected stimuli images, and gridded AOI's to conduct basic eye-tracking tests. Subjects are exposed to each stimulus for approximately 5 seconds while

there eye gaze data is captured. The results of these tests are placed on a subject matrix (See Figure 3).

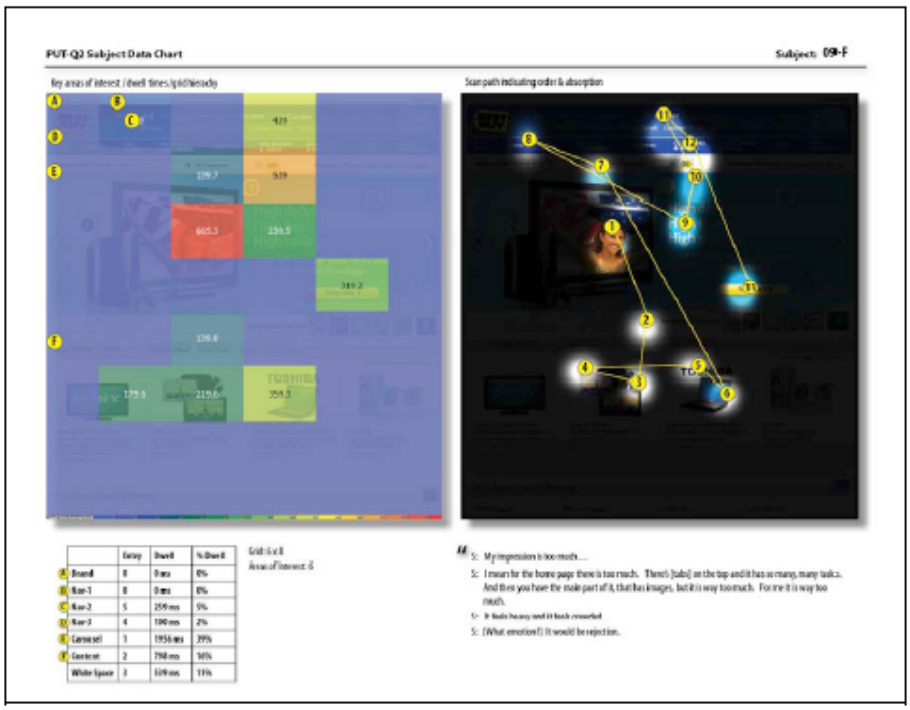

Figure 3: Subject matrix. Gridded AOI's and scan path data.

Students examine these results and revisit their hypothesis. For example, H1 can be revisited and proven true by examining the results of the gaze data in which subjects do miss at least one of the three levels of navigation on a statistically significant interval.

Students then utilize the results of these usability tests to inform further design iteration.

CONCLUSION

This paper assembles theories and methodologies outside the A/DE realm, and combines them in a unique way to create a new novel design studio methodology while exposing students to design research labs and eye-tracking equipment.

Students augment their design education with 'hard' science to create a truly unique designer much sought after by industry.

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