

Chapter 3

METHODOLOGY

This research was based on the theoretical framework created using the theories of cognitive science, visual imagery, design and drawing. The researcher came to the conclusion that more empirical data was needed to illuminate the interaction of memory, creativity and the design process. This research begins that process by quantifying the effect of study drawings on the design process.

Introduction

In an effort to add empirical data to the theory that study drawings are a necessary part of communicating and furthering the design process the following procedure was developed. This research provides quantitative data illustrating and supporting the theory that the design process and final solution are enriched by the use of explorative study drawings. The following hypothesis was tested:

H₁: There is a relationship between the quantity, creativity, and efficacy of process and the quality of the final design product.

Additionally a more descriptive evaluation in the form of case studies was utilized. A close-up view of study drawings' role in the design process allowed the researcher to categorize the steps that were made from study drawing to study drawing along the path toward a design solution.

Participants

The subjects utilized for this study were students in the interior design major in a Foundation of Interior Design Education and Research (FIDER)

accredited program in a university in Virginia. The students were participating in their first year of the program. Although all students were in their first year in the program, some are transfer students. The students are predominantly female.

The sample was taken from Design Fundamentals I. Design Fundamentals I is a basic design class with predominant focus being on learning the basics of design communication. Some of the major emphases of this sequence are the elements of design (line, shape, form, space and light) and the principles of design (figure/ground relationships, tone, texture and composition). Additionally, there is a focus on designing using an idea generator or inspiration and working through a concept into the design solution as a basis for creating a unified design solution. Particular emphasis is given to recording visual notes and study drawings for each project showing a visual record of the thought path that led to the design solution. There is no prerequisite for previous art or design instruction.

The Design Fundamentals I class is focused on the basics of design and craftsmanship. The majority of the projects are experiences in designing in a two-dimensional composition format. As the title, Design Fundamentals suggests, this class is intended to allow the students to explore and develop an experiential understanding of the basics of design. The lessons and vocabulary learned in this class is utilized and reinforced throughout the successive years of their studio experience.

Materials

The students are required at all levels of the major to maintain a journal or sketchbook of ideas and process for each project. The process includes any study drawings, pictorial or verbal, that they utilize in formulating possible solutions to design problems. These drawings were collected and evaluated for this research. Additionally, this study included the comparative images of final design solutions as a visual reference to the success or fruition of their design process.

Judges

Expert judges for the study will include interior design faculty with both professional experience and classroom experience. Assessments were based on a numerical scale detailed below. Prillaman assessed all projects and process including those from Whitney's class, while Whitney assessed all projects and process including Prillaman's students in order to reduce bias.

Design and Procedure

The judges examined the journals and assessed the process for the Design Fundamentals I final projects and compared the use and success of the study sketches to the outcome of the project. These projects were evaluated on the students' ability to show their knowledge of the concept being explored and their success in communicating design ideas. The journals were evaluated based on the quantity and quality (creativity and efficacy of communication) of design thinking during the process of solving a design problem.

Project 12 - Design Fundamentals I

The project utilized in Design Fundamentals I is a project where the students are asked to utilize Lightman's (1993) Einstein's Dreams as a primary generator, develop a concept and design a working light fixture. The project requirement information that is given to the student is included in Appendix A.

Project Creation

The projects were described in the course syllabus as a scheduled project for the class. The students utilized class time and instructor input to create their final products. Drafting tables were provided in the classroom by the university. The instructor of record completed student grade assessments. Students were responsible for providing their own materials for completing the project. A copy of the project statement was given to each student (Appendix A).

No more and no less emphasis was placed on process than was placed on prior projects. Emphasis was placed on creating a novel solution utilizing all concepts learned during class time up to that point. After project grades were assigned, the instructors discussed the results and purpose of the research with the students.

Project Assessment Sessions

Expert judges provided assessments on two different days in two different locations. Judges did not discuss results of the project prior to judging. During evaluation, the judges assessed the process and final products from Design Fundamentals I, Project 12 utilizing prepared evaluation sheets (Appendix B).

Materials

The instructors utilized a Likert type scale for evaluating both the process and the product of the design problem. The evaluation sheets focused on the quality and quantity of process and the final product were evaluated on the students' use of design knowledge and the ingenuity of the design product.

The evaluation scale that was utilized is based on an eight-point scale. With this eight-point scale, a rating of one (1) indicated that the process or projects was poor or not available for consideration. A rating of two (2) or three (3) indicated below average work. A rating of four (4) or five (5) indicated average work and a rating of six (6) or seven (7) indicated above average work. Ratings of eight (8) were reserved for exceptional work. Sample assessment sheets for each design problem are included in Appendix B.

Data Analysis

A visual comparison of student process and final project development was discussed using pictorial examples of journal records of study drawings and final projects turned in for evaluation. Additionally sketch journal assessments and final project assessments were averaged and compared to show the relationship of the students' degree of journal involvement and the success of the final project.

The assessment of the process will be compared to the assessment of the final product utilizing multiple regression. A positive correlation, with an alpha level of .05 or less, would show the extent that quantity, creativity and sketching efficacy in the design process predict the success of the design solution in the

end product. The SPSS (Statistical Package for the Social Sciences) 10.0 for Windows was utilized to obtain the results of this research.

Case Studies

Introduction

Case studies can be used as a means to help explain, describe and explore a phenomena where there is no clear set of possible outcomes (Yin, 1984). Yin (1984) and Woods (1999) suggest that case studies can be paired with empirical data in order to bring understanding to a complex process. In the event that there are numerous situations to study, a multiple case study procedure is warranted.

The evidence considered in case studies should, ideally, include the investigation of all possible sources and examine different perspectives of the phenomenon (Woods, 1999, Yin, 1984). Some strategies recommended are exploring differing theories, visual evidence and other opinions. Specifically in evaluating data for teaching, Yin (1984) calls for the imperative of presenting the view of all the individuals with a role in the case.

In these case studies, differing theories were presented in the literature, both instructors were involved in evaluation, and finally the students themselves were involved in the evaluation of the cases. The method for interpreting the cases was developed from the literature review.

Participants

Three students' visual process examples were selected for further evaluation. One male and two females created the cases selected. The male

student was 19 years of age and an academic sophomore. The two females were 18 years of age and were academic freshmen. All three students are first year interior design students. The cases were numbered originally for the empirical evaluation but were renumbered (1, 2 and 3) for the actual case studies.

Materials

Three examples of process and projects that were completed for Project 12 (described previously) were selected for further description and evaluation.

Judges

Expert judges for the study will include interior design faculty with both professional experience and classroom experience. The researcher and a second judge corroborated on the assessments of the individual cases.

Design and Procedure

Process, as evidenced in study drawings, was described utilizing communication styles referred to by Goldschmidt (1991), Herbert (1993) McKim (1980) and Schon and Wiggins (1992). Evidence of “mark / interpretation / mark” where the student utilized a conversation between self and study drawing was highlighted for visual description (Herbert, 1993, p.62).

Rusch (1968) in “The role of graphic activity in the design process” developed vocabulary to further describe the process “communication” between designer and sketch. The study drawings were evaluated as to the nature of the changes made from drawing to drawing. The three changes made to drawings are defined as leveling, sharpening and normalization.

Finally the process (study drawings) was evaluated to determine what was being communicated during each successive step. This evaluation was based on whether the study drawings provided information about “form, detail, scale” (Garner, 1990, p. 51) or if they acted to “clarify conceptual development, facilitate evaluation or provoke further generation of ideas.” (p. 51).

Therefore, there were three areas evaluated; evidence of communication, the nature of the communication and what information was communicated during the design process. This data is included in the form of reproductions of student drawings and student final products. Judges’ observations were placed with the reproduced journal pages interspersed in the narrative. Letters in boxes were superimposed on the journal reproductions as a way of allowing the reader to follow the descriptions. Concluding observations follow descriptive data.

All three subjects were interviewed to evidence their perception of their process. The subjects were asked to describe in their own words how they utilize study drawings to aid in the development of a design solution. They were also asked about the three areas of evaluation and if they agreed with the assessment of their process. Finally the subjects were asked to describe their solution process step by step utilizing the reproductions of their process from their sketchbooks. The expert judge recorded the interview by taking notes.