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Graphic Design: Understanding How Students Learn About And Create Graphic Designs

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GRAPHIC DESIGN: UNDERSTANDING HOW STUDENTS LEARN ABOUT AND CREATE GRAPHIC DESIGNS

by

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ABSTRACT

This study analyzed and discussed how students learned about and created entry-level graphic designs. The research examines students' methods of learning graphic design, their attitudes toward learning, students' knowledge of and attitudes toward technology, and how students' acquired knowledge. Qualitative research is conducted in a classroom of an entry-level graphic design course at an Upper Midwest university. Data is collected through interviews and observations during the class. Literature on research strategies, learning styles, technology, and student understanding provide methodological foundation for this study.

Graphic design is defined as visual communication designed with an emphasis on conveying information with meaning and significance. Graphic design communicates more than just words. It may communicate an unintended message. Thus damaging the image of a company or cause. Learning to understand and apply the theory of graphic design to the practice of design helps students achieve the intended communication and effective design.

The patterns or themes were discovered through data analysis, which include participant interviews, observations in the college classroom

environment and analysis of students' projects. The general categories that emerged during this study include background information, learning style, perceived problems with technology, approaches to design and acquired knowledge of course content. The data was sorted and coded, then studied for themes. Three themes emerged during the research: students' approaches to learning affected their learning; students' knowledge of technology affected their learning; and students' acquired knowledge affected the creation of their designs.

The results of this study demonstrated that students learn by different methods. Additional factors (interest, classroom environment, attendance, and deadlines), knowledge of technology, and acquired knowledge of class material affected the student's understanding of graphic design and their design creation.

CHAPTER I

INTRODUCTION

Suppose you want to announce or sell something, amuse or persuade someone, explain a complicated system or demonstrate a process. In other words, suppose you want to communicate a message. How do you "convey" it? You could tell people one by one, broadcast by radio, or by loudspeaker. That is verbal communication. But if you use any visual medium at all—create a poster; type a letter; create a business logo or a magazine ad, or even produce a computer printout—you are employing a form of visual communication called graphic design.

The purpose of this study was to understand how students learn about and create entry-level graphic designs. The students who experienced learning design in the classroom environment were studied for six weeks during the fall semester of this university's school year. The study focused initially on the students' approaches and attitudes concerning the study of graphic design. However, questions related to students' knowledge and attitudes about technology and whether students' acquired knowledge of class material affected their creation of design also emerged.

In Chapter I, the reader is provided with background information on graphic design and learning. Also described are the need, purpose, limitations, and organization of the study.

Graphic Design and Learning

Graphic design is defined as visual communication created with an emphasis on conveying information with meaning and significance (Resnick, 1984). In their work, graphic designers utilize typography, illustration, symbolism, and photography, often in various combinations, to communicate ideas in visual terms.

Graphic design is problem solving on a two dimensional surface. The designer conceives, plans, and executes designs that communicate a specific message to a specific audience within given limitations–financial, physical, or psychological (Resnick, 1984).

In today's society the role of the graphic designer is growing. Primarily concerned with layout and production in the past, some graphic designers perform a whole range of work–typography, illustration, photography, corporate identity, logo design and advertising–while other designers may choose to specialize in one area. Whatever route designers take, it is vital that the designer's awareness of what is said and how to visually say it effectively is important for maximum outreach (Resnick, 1984).

Communication is an imperative element in graphic design. Arntson (1988), the author of the book *Graphic Design Basics*, suggests that the element of communication is what makes the field of graphic design such an interesting and contemporary area. Designers must present current information of modern taste with up-to-date tools. They must stay informed about trends, issues, inventions, and developments to successfully connect with their audiences (Arntson, 1988).

Graphic design always communicates more than just words. It may, however, communicate an unintended message, which can damage the image of a company or cause. Learning to understand and apply the theory of graphic design to the practice of design helps students achieve the intended communication while creating an effective design.

How do instructors teach graphic design effectively to student designers? Arntson (1988) claims design education is a lifetime activity; constant change will require constant renewal.

In the past, the conventional process of teaching and instructional design typically revolved around a teacher planning and presenting to students. According to Oliver (2002), teachers lead students through a series of instructional projects to achieve a desired learning outcome. "Contemporary learning theory is based upon the notion that learning is an active process of constructing knowledge rather than acquiring knowledge, and that instruction is

the process by which this knowledge construction is supported rather than a process of knowledge transmission" (Oliver, 2002, p. 497).

In learning settings that support knowledge construction, the emphasis is placed on learning as a process of personal understanding and the development of meaning in ways that are active and interpretative (Oliver, 2002). Effective teaching entails identifying what students gain by solving problems, and using content, process and criteria directed toward learning.

All students do not learn the same way, nor do they learn at the same rate. According to Kelly (2000),

> "Some learn from success, others learn from failure. For many students, learning is a growing effect of all course work; while for others, the learning is centered in one or two problems. For most students, understanding might not come until much later. There are students who actually learn more from classmates than from teachers. It is more effective for some students to move from the general to the specific; while others learn by progressing from the specific to the general. Most students learn through doing, but others learn from exposure; a few learn from hearing or reading about design. There are even students who learn by imitating work of other designers. All students learn by a combination of methods; which makes teaching design challenging" (Kelly, 2000, para. 5).

Understanding the visual properties cannot be verbally communicated to students. Students, therefore, acquire the understanding through experience, with the process being guided by teachers who understand the process and

criteria (Kelly, 2000). Success with students depends on feeding them enough information to progress, but not so much that they only follow directions.

Problem Statement

The purpose of this study was to understand how students learn about and create entry-level graphic designs.

Need for Study

Some educators believe that the implied value in graphic design is to train our students to perform "real" projects as opposed to theoretical exercises. Other educators believe that students need to acquire the basic "rules" or principles of design before they execute projects assigned with internships or job opportunities. Design history, basic research theory, and the opportunity to experiment are essential for students to develop. Designs are considered effective when the designer produces a design employing his or her knowledge of graphic elements and the audience interprets the design as intended.

Because we, as society, place an immense value on visuals it is important to understand the cognitive values we normally place on text and graphics (Kelly, 2000). This helps us understand why the established design elements work and how they can help us utilize them properly in our graphic designs.

It is necessary for students to understand the importance of an effective design and how design is used to communicate visual messages. This involves

knowing the graphic elements (line, shape, texture, space, type, value, and color), the seven graphic principles (contrast, balance, proportion, rhythm, harmony, movement, unity), and knowing and understanding the criteria for each project. Understanding these basic design concepts is essential to an efficient design. In visual communication, if the concept is not strong, great visuals will eventually fall flat. Strong, thoughtful designs influence how people think, buy, and respond in the world.

Placing an emphasis on how design is learned and what essentials are important to consider when designing will aid in the development of curriculum that will better prepare the students for the design industry (Kelly, 2000). If students are better prepared for jobs in industry, then they will have a better chance of being hired. Employers will not be interested in designers' memorized knowledge, but in their abilities – to use knowledge constructively to perform tasks, make decisions, communicate ideas, and handle responsibility (Ross, 2001).

Research Questions

1. Is there a difference in how students learn about and understand the content, process, and graphic design problems?
2. Can difficulties with materials and technology distract students from learning and understanding graphic design fundamentals?

Limitations of the Study

The limiting conditions of this study includes:

1. Participants in the study were 16 students and a teacher in one classroom.
2. Participants were observed in one classroom.
3. The site was at an Upper Midwestern university.
4. The observations and interviews took place during the 2003 fall semester.
5. The lengths of the observations were 90-minute class sessions.
6. The study period was six weeks.

Definition of Terminology

1. Graphic design is visual communication created with an emphasis on conveying information with meaning and significance (Resnick, 1984).
2. Learning styles are the "how" we acquire and process information (Entwistle, 1981).

Organization of the Study

Chapter I contains an overview of graphic design and learning. It also includes a discussion of the need, purpose, limitations, and the organization of the study.

The literature used in this study is discussed in Chapter II. This chapter provides a short summary of the resources utilized within the study to attest validity. Validity is seen as a strength of qualitative research; it is used to

determine whether the findings are accurate from the standpoint of the researcher, the participant, or the readers of an account (Creswell, 2003).

The methodology used for this study is described in Chapter III. I begin with the fundamentals of qualitative research and discuss the strategy of triangulated data. Next, I provide a rationale for choosing the qualitative methodology. Specific information on the procedures of this study and the data gathering techniques (i.e., interviewing, participation observation, coding procedures, and participant feedback) is provided at the end of the chapter.

In Chapter IV, the reader is presented with excerpts of each participant's story. The data from interviews and observations was sorted and coded for similarities, resulting in categories and patterns that developed into themes. Three themes emerged and are discussed with reference to the professional literature. I provide voice to the participants and share their perceptions confirmed through observation descriptions documented in my field notes. Consistent categories are provided for each participant's story, including background information, what they think about when creating a design, how they learn, what elements or materials assist in their learning, and what distractions they encountered.

In Chapter V, the identified themes and a summary of the study are provided. Conclusions of the study and recommendations for further research are also provided in this chapter.

CHAPTER II

LITERATURE REVIEW

In educational studies there has been tremendous research accomplished in various areas including research strategies, learning styles, technology, and student understanding. There has also been numerous graphic design research completed in a range of areas: the Gestalt theory, design elements and principles, design applications, the importance of design, and how design affects society and business.

The review of literature represents significant information that is referenced for this study to support the themes that emerged during my research. The collection of studies, papers and books has provided substantiation about students' learning styles, their attitudes about learning and about technology, their knowledge of technology, and acquired knowledge that affects students' creation of designs. Aspects of each publication contributed to and were meaningful to this study.

Education and Research

In the book *Educational Research,* author John Creswell (2002) explores how individual teachers, a school-university team, and university faculty can engage

in action research. He discusses the types of action research, key characteristics, steps in conducting a study, criteria for evaluating, and how to apply what you have already learned. Creswell's text looks at both qualitative and quantitative methods in conjunction to action research.

The framework, process, and the compositional approach for designing qualitative, quantitative, and mixed methods research in the human and social sciences is provided in John Creswell's (2003) book *Research Design: Qualitative, Quantitative, and Mix Methods Approaches.* He provides a framework, a process, and a compositional approach for designing qualitative, quantitative, and mixed methods research in the human and social sciences. The author addresses the key elements of the process of research: writing an introduction; stating a purpose for the study; identifying research questions and hypotheses; using theory; defining, delimiting, and stating the significance of the study.

In the journal *Health Technology Assessment* (*HTA*) E. Murphy, R. Dingwall, D. Greatbatch, S. Parker, and P. Watson (1998), examine the nature and status of qualitative methods in relation to their potential uses in *HTA*. Qualitative research involves the collection, analysis and interpretation of data that is not easily reduced to numbers. "Qualitative research can be found in all social sciences and in the applied fields that derive from them, for example, research in health services, nursing and pharmacy" (Murphy et. al, 1998, para. 1). Most

qualitative researchers accept that there is an objective, material world, as do realists, but question the ability to know this directly. "In the social sciences, what people perceive or believe is the basis of their actions rather than what an impartial observer might think is actually true" (Murphy et. al, 1998, para. 3).

A validity strategy of qualitative and quantitative research is triangulation. The question of whether qualitative and quantitative studies should be triangulated was discussed in Mitchell's (1986) study titled *Multiple triangulation: A Methodology For Nursing Science.* He states that a trend emerged over the last decade that has increased the blending of qualitative and quantitative data within a study to answer clinical and theoretical questions. This was referred to as triangulation. The combination of methods has been viewed as somewhat controversial. In Mitchell's study, types of triangulation as well as issues and strategies to consider for conducting multi-method studies are described (Mitchell, 1986).

Marshall and Rossman (1999) discuss qualitative research, triangulation, and establishing the validity of qualitative studies in their book *Designing Qualitative Research.* The book is written so readers would be able to apply basic methods of triangulation to qualitative evaluations. The authors assert that if readers are asked to prove whether their qualitative evaluation findings are

correct, they will be able to describe how to checked the validity of their findings and describe why they have confidence in the evaluation results.

Graphic Design

How does graphic design communicate with the world? D.K. Holland (2001), author of the book *Design Issues: How graphic design informs society,* explores how design communicates with, rubs itself against, and sometimes stumbles around the "real" world. The author directs some light on the objectives of design and related disciplines in order to demystify this very important form of expression. The book is an introspective, which examines the inner life of the designer, and an extrospective, which explores the role design has in society (Holland, 2001).

Before one begins to understand how design is able to communicate with the world, one needs to understand the basics of graphic design. Amy Arntson (1988) offers a broad overview of the field of graphic design in the book *Graphic Design Basics*. The book interweaves a concern for design basics with more specialized information. Abundant illustrations allow desired designers to learn visually, while projects and exercises challenge them to learn by kinesthetics.

The elements of graphic design play an important part of the finished product. The focus of Gestalt theory is the idea of "grouping". In the article *Gestalt and Industrial Design,* author Nada Dabbagh (1999) explains the Gestalt

theory and its wide-ranging implications for several disciplines and learning theories. She states that several theories build on components of Gestalt theory. Several disciplines, including art, music, psychology, and instructional design, among others, can be related to Gestalt theory and follow Gestalt principles in some form.

The design elements and principles are critical to learn and understand in graphic design. In his article *Design Elements & Principles,* author Yangjoo Park (1998) elaborates that the elements and principles inform designers where to begin, what to probe, and how to analyze. Park's article describes each element (line, shape, form, space, color, texture) by definition, its position in design, and the various ways to use each element. The article provides examples of each design element and principle.

Rune Patterson (1989) takes another look at design principles in the book *Visuals for Information Research and Practice.* She splits the book into two parts. Part 1, Textual Aspects of Design, discusses the design applications of text. Part 2, Graphic Design Considerations, deals with the design applications of line art. A final topic concern discusses the arrangement, group, and sequence of information on forms. Understanding the principles helps us better understand why the established forms of design principles work especially as it relates to

cognitive process. Pettersson (1989) helps readers utilize the design principles appropriately so that artists create efficient and effective design.

Graphic designers must keep in mind the steps of design. Rick Parker (1998) examines the process of graphic design for printed publications, presentations, and Web sites in the tutorial *Looking Good in Print*. Aspects of graphic design that are established are steps in the graphic design process, guidelines for creating and organizing layouts, capturing reader's attention, the elements of design, the principles, and design problems to avoid.

Why is graphic design important to society? Graphic design is vital to businesses' economic success as Cheryl Dine (2003) discusses in her article *Branding: Why graphic design is important*. A strong, thoughtful design influences how people think, buy, and react in the world. Studies show that when a client sees consistent messaging that appeals to the targeted audience, he or she is more likely to recognize the brand for its attributes because of the visual communication.

Visual messages that communicate to society have an impact on how society responds. Advertisements are a form of visual communication for businesses that impact consumers' thoughts and purchasing behaviors. Thompson and Hirschman (1997) propose in their study *Why Media Matters: Toward a richer understanding on consumers' relationships with advertising and mass*

media, that consumers' relationships to non-advertising forms of mass media are an essential aspect of the perceived meanings they derive from advertisements with their research. Thompson and Hirschman conduct semi-structured interviews ranging from 90 minutes to two hours in length with 28 consumers, balanced across gender. From this study, three interpretive strategies were identified that consumers employed to form relationships with the mass media: (1) inspiring and aspiring, (2) deconstructing and rejecting, and (3) identifying and individualizing. Within each of those broad relationships was a complex array of personal meanings, self-perceptions, and cultural beliefs that allowed mass media images to become relevant to consumers' everyday lives.

Commercial advertisements can be a very powerful and influential medium to consumers in society. Alexander, Benjamin, Hoerrner and Roe (1998), researchers of a study titled *We'll be back in a moment: A content analysis of advertisements in children's television in the 1950s,* conducted content analysis to gain basic information on the content of the commercials in children's programs of the 1950s. There were 75 commercials that were coded from 24 shows. Each of the 75 commercials was assigned to one of the major product type categories derived from previous research plus an "other" category. The 1950s was the decade of the adult white male spokesperson. Of the 60 children's advertisements coded, 48.7 percent (28) had as their on-camera spokesperson a

white male and 26.7 percent (16) had a man as their off-camera narrator. In the advertisements a stark contrast between children's advertising in the 1950s and contemporary advertising was shown (Alexander et. al., 1998).

Tobacco companies are more likely to advertise cigarette brands favored by teenagers in magazines that teens are likely to read. This is the conclusion of a study done by Michael Siegel (1998) titled *Adolescent exposure to cigarette advertising in magazines: An evaluation of brand-specific advertising in relation to youth readership.* This study focused on cigarette advertisements in 39 popular U.S. magazines in 1994. Of 12 brands of cigarettes, those favored by teens were more likely to be advertised in magazines read by teens and the probability of these ads appearing increased as the teen readership increased. These magazines were less likely to advertise brands favored by adults.

Education and Learning Styles

The "task" of interest in the present context is education–learning and remembering in school and transferring what is learned to the world outside of school. Ronald Schmeck (1988) states in his book *Individual Differences and Learning Strategies* that style is any pattern we see in a person's way of accomplishing a particular type of task. In education, if we understand the styles of the individual students we can often anticipate their perceptions and

subsequent behaviors, anticipate their misunderstandings, take advantage of their strengths, and avoid (or correct) their weaknesses.

People learn differently at different times. The way in which people learn affects the sort of mnemonics they should consider using to store information ("Mind Tools", 1999). The three main learning styles are: visual, auditory, and kinesthetic. It is unlikely that a person would use only one style exclusively, because there is usually a significant overlap in learning styles. This Web site elaborates on the three learning modalities and the memory implications of learning styles.

There are three basic modalities to process information to memory: visual, auditory, and kinesthetic ("Learning Modalities", 2000). This Web site discusses the personality characteristics of the learning modalities and the effective teaching techniques for each learning modality.

Everyone has an extraordinary capacity to learn in many different ways. The book *Learning Styles* written by Judith Reiff (1992) reviews several approaches for describing learning styles and the instructional implications for teachers. The more we can know about and understand the complex child, the more effective and efficient will be the teaching and learning process. We know people think and act differently, yet this fact becomes lost in the education

process. We may not understand precisely how or in what way individuals differ.

There are personal factors that affect students' learning in the classroom. Kerssen-Griep, Hess, Trees (2003), discuss the instructional communication research about student motivation in the article *Sustaining the Desire to Learn: Dimensions of Perceived Instructional Facework related to Student Involvement and Motivation to Learn*. The authors also explain the mechanism by which communication influences learning motivations, and motivational theories in psychology and education. They discuss the extended existing research and theory about classroom communications influencing student motivations and involvement.

Besides personal factors, there are external conditions that affect a student's learning style. Vicki Cohen's (2001) study titled *Learning Styles and Technology in a Ninth-Grade High School Population* explores whether a technology-rich environment, one that promotes a construct approach to learning, has a significant effect on learning styles of freshman high school students. The study took place in the 1996-1997 school year in which the entire high school classes from two different high schools were assessed on learning style. The results show that a student's learning style can be altered and affected through the external conditions set in its environment. Therefore, a hypothesis was set forth

in Cohen's study stating that a technology-rich environment, one that supports a constructive approach to learning, would change a student's learning style after a year-long period of exposure.

Education and Technology

Technology has become an intricate learning tool of educational classes. Students can feel overwhelmed when presented with a new technology, which could affect their learning. In the article *Six Stages for Learning to Use Technology,* Russell (1996) claims that learning to use technology for adults is traumatic. She discusses the validation of learning to use a new technology through five stages of awareness: (1) learning the process, (2) understanding and application of the process, (3) familiarity and confidence, (4) adaptation to other contexts, and (5) creative application to new contexts.

Although technology is not new to educational practices, some believe that it is at fault for poor programs. The pros and cons of a related trend in educational reform, and the selling of students to companies and advertisers in return for advanced technology are discussed by Hunter (1998) in the article *Technology in classroom: Haven't we heard this before?* The author claims that there tends to be a pattern of failure with technology; though the experience brings about significant change. He argues that what's wrong with education cannot be fixed with technology.

Does technology affect student learning? Schacter's (1999) article titled *Impact of Education Technology on Student Achievement: What the Most Current Research Has to Say* analyzed five large-scale studies of education technology. The intent of his article is to briefly summarize the positive and negative impacts of various technology studies on student achievement. It also outlines what we know about the impact of education technology on learning and to identify resources for further study.

Schacter's study discusses the positive and negative impacts of technology, whereas Billig (2003) addresses that the potential use of technology for increasing student achievement is not always well understood. In her article *Increasing Student Achievement with Technology* she claims that collective responsibility and participation is not always easy to achieve, and its importance is not always recognized. Billig's article provides a brief summary and suggests a variety of strategies for each stakeholder group (educators, parents, school boards, community members, and students).

New technologies will make a noticeable difference to the quality of education when they become fully integrated into the educational system, and not before. In the editorial *How can learning Technologies Improve Learning,* Laurillard (1997) discusses the context for learning technologies, the relationships

between the medium and the approach, between logistics and approach, and between learning task and learning outcome.

Education and Student Understanding

A challenging, yet important factor in education is to understand if students acquired the knowledge discussed in class. Aspects, which are most directly applicable to understanding the processes, are related to learning intellectual skills and acquiring knowledge, are concentrated on in Entwistle's (1981) book *Styles of Learning and Teaching*. Entwistle presents an overview of current ideas in educational psychology in the hope of providing a more coherent picture of what otherwise tends to be a rather fragmentary set of topics drawn from mainstream psychology.

Did students really understand what was being presented to them in class? Koker (1996) conducts a study titled *If You Want to Know What Students Understand, Ask Them* to gain insight into how much students actually understood, and what they learn by working on assignments and problems. Koker convinces his students that the most important part of their assignment is to demonstrate to him the substantial thought that went into their work. The paragraphs which addressed a student's own learning were particularly helpful with his assessment. In addition, students were using these papers to ask

questions about material that was not clear. The method created a non-threatening situation for the student to express confusion.

An assessment of students' acquired knowledge is one way to learn and understand if students have acquired the materials discussed in class. Students think they know how to interpret the questions, but actually do not know how to do so, while others know how but fail to do so. In research titled *Do Students Really Understand What is Asked in Assessment Questions,* Tang (2003) reports many students attempting to understand the requirements of the question by reading through the questions, identified key words and searched for cues. Her study used questionnaires and in-depth interviews to explore the strategies students adopt in interpreting assessment questions.

Tang assesses students' understanding of course material by asking questions whereas Volkmann observes and interviews his students. In the research *Seamless Assessment: Finding out Students Ideas about the Moon,* Volkmann (2003) demonstrates how assessment could function across an instructional sequence to provide important information about student learning. He describes a variety of purposes and strategies for assessing student learning.

One way to assess whether students learn and understand what is being taught to them is by looking at the projects and the results produced. In the editorial *How Can Learning Technologies Improve Learning,* Laurillard (1997)

discusses the relationship between learning task and learning outcome. In this study comparing two different ways of introducing a simulation, Laurillard showed both led to qualitatively different outcomes: the functional task description and the structural task description. The functional task description is in terms of the operational commands needed to achieve certain behaviors of the system. The structural task description is in terms of the organization and inter-relation of the different features of the system or program led to real-world interpretations of its behavior. Laurillard (1997) justifies that the student's approach will be influenced certainly by the nature of the medium, but also by the logistics–of the hardware, how it is arranged in a room, whether the accompanying notes are available, whether there is sufficient time allotted, and how many are in the class.

Additional reviews of various books and articles were collected and used to determine validity of my study. The additional sources contained information regarding the importance of a good design, what elements and principles are utilized to create a good design, and what is considered a bad design. In addition, articles were reviewed for information regarding visual communication and their significant messages. Those authors and titles are listed throughout the study and in the reference section.

CHAPTER III

METHODOLOGY

The purpose of this study was to understand how students learn about and create entry-level graphic designs. This chapter discusses the methods and procedures performed to gather the essential information to complete the study. Qualitative research was conducted to obtain the necessary data to accomplish the goal of this study. Specifically, data was collected through interviews, participant observation and document analysis.

Used in an applied setting such as a classroom, qualitative research allowed me to collaborate with students in order to understand how they learn about and create their designs. Creswell (2003) defined qualitative research as,

> "An approach in which the researcher often makes knowledge claims based primarily on constructivist perspectives or advocacy/participatory perspectives or both. It also uses strategies of inquiry such as narratives, phenomenologies, ethnographies, grounded theory studies, or case studies. The researcher collects open-ended, emerging data with the primary intent of developing themes from the data (p. 18). Qualitative procedures rely on text and image data, have unique steps in data analysis, and draw on diverse strategies of inquiry" (p. 179).

Qualitative Research

Qualitative research takes place in the natural setting. The researcher often goes to the site (classroom) of the participant to conduct the research (Creswell, 2003).

Qualitative research is interpretive research, with the researcher typically involved in a sustained and intensive experience with participants. Creswell (2003) claims this introduces a range of strategic, ethical, and personal issues into the qualitative research process. With these concerns in mind, researchers clearly identify their biases, values, and personal interests about their research topic and process (Creswell, 2003). Comments about the role of the researcher set the stage for discussion of issues involved in collecting data.

Before entering the research setting, qualitative researchers plan their approach to record data (Creswell, 2003). He suggests the proposal should identify what data the researcher will record and the procedures for the recording data (e.g. observations, interviews, documents and visual materials).

The next step, once the data has been collected, is the process of analysis. This involves making sense out of text and image data. Creswell (2003) recommends beginning the detailed analysis with a coding process. He writes:

> "Coding is the process of organizing the material into 'chunks' before brining meaning to those "chunks". It involves taking text data or pictures, segmenting sentences (or paragraphs) or images into categories,

and labeling those categories with a term, often based in the actual language of the participant" (p. 192).

The coding process identifies the themes and patterns among the data recorded. Themes are analyzed for each individual case and across different cases, or shaped into a general description (Creswell, 2003).

A final step in data analysis involves making an interpretation or meaning of the data (Creswell, 2003). " What was learned" captures the essence of the data. Interpretation in qualitative research can take many forms, be adapted for different types of design, and be flexible to convey personal, research-based and action meaning.

Proposal developers need to convey the steps they will take in their studies to check for the accuracy and creditability of their findings. "Validity is seen as a strength in qualitative research, but is used to suggest determining whether the findings are accurate from the standpoint of the researcher, the participant, or the readers of an account" (Creswell, 2003, p. 196).

"Qualitative studies may ask broad, open-ended, and interconnected questions that were not always specifiable as conventional hypotheses" (Qualitative methods in health research, n.d., para. 8). The researcher expects that significant insights will emerge during the course of the research that will steer the project in an unforeseeable direction. It is important to strike a

balance among well-defined areas of inquiry, achievable aims, and openness to unanticipated findings. Once the specific aims are formulated, the researcher needs to address exactly how the aims relate to each of the remaining sections and clearly link them to research methods, procedures, and analytical processes (Qualitative methods in health research, n.d., para. 10).

A research plan is designed to explain the strengths and limitations of the methods that could be used as compared to the alternatives not selected and a well-balanced, critical analysis of the information the study can and cannot provide (Qualitative methods in health research, n.d). The research plan consists of four sections.

The first section is a sample plan (Qualitative methods in health research, n.d). The sample plan section specifies the characteristics of the subjects, who will be included in the sample, and how often observations are done. Observations are done to ensure that the data represents a snapshot across all reasonable possibilities that are related to the research aims (Qualitative methods in health research, n.d).

The second section is data collection. This component of the research design and methods section addresses data collection instruments, methods, and procedures. It includes explanations of each of these areas and how the

methods used would address the research questions (Qualitative methods in health research, n.d).

The third section is data analysis. This component lays out the specific procedures for addressing each of the research questions and/or hypotheses, and the nature and form of the expected results (Qualitative methods in health research, n.d).

The fourth section is data interpretation. This component is used to describe the process by which the investigator will arrive at data integration and conclusions (Qualitative methods in health research, n.d). The potential significance of the findings for both the immediate questions and broader issues can be addressed here.

Qualitative research evokes consideration about confidentiality and the protection of participant identity. Ethical questions are raised due to the special closeness that developed between the researcher and the study participants (Qualitative methods in health research, n.d).

Murphy (et. al., 1998, para. 1) states, "Qualitative research involves the collection, analysis and interpretation of data that are not easily reduced to numbers." Qualitative methods are useful in the exploratory stages of a research project, where they will often help to clarify or even set the research question, aid conceptualization, and generate hypotheses for later research.

Qualitative methods have also been used to interpret, qualify or illuminate the findings of quantitative research and to test hypotheses (Murphy et. al., 1998).

Murphy (et al, 1998) believes there are five components to the method of qualitative research. The first component is participant observation. Participant observation is used to study issues upon the routine functioning of the setting in which they are to be implemented (Murphy et. al., 1998).

The second component is interviews. Interviews are used, particularly in exploratory research, to study the range and complexity of ideas and definitions employed by individuals and groups involved in the implementation of the issue being researched is written records. The analysis of writing records is an important contribution that makes our understanding of the processes and consequences associate with the research (Murphy et. al., 1998).

The third component is written records. The analysis of written records has an important contribution to make to our understanding of the processes and consequences associated with the study (Murphy et. al., 1998).

The fourth component is conversation analysis. The techniques of conversation analysis provide detailed data about the issue being researched (Murphy et. al., 1998).

The fifth component is research ethics. Murphy (et. al., 1998, para. 14) explains, "The mechanical application of ethical codes can develop in the context of the research. Qualitative research may distract from those ethical risks which are specific to qualitative research."

The same validity and relevance is appropriate for qualitative research. There are two stages of assessment in qualitative research. The first one is relevance.

> "Given that most qualitative research is based on a single case or only a small number of subjects, the generalizability of qualitative research is achieved by the generation of theoretical statements, which guide policy makers but remain to be tested through application in other contexts" (Murphy et. al., 1998, para 16).

The second stage is data handling. "Computerized analysis packages for qualitative data offers an efficient way of handling qualitative data sets and improved the rigor of the analysis by facilitating searches for falsifying evidence" (Murphy et. al., 1998, para 18).

There are strengths and limitations to qualitative approaches. However, where qualitative research is conducted properly and data analyzed thoroughly, this approach can provide valuable information on the research study.

Data Triangulation

Validity, in qualitative research, relates to whether the findings of your study are true and certain (Marshall & Rossman, 1999). Triangulation is a method used by qualitative researchers to check and establish validity in their studies. A strategy used to maximize the validity of this study is data triangulation. Data triangulation involves the use of different sources of data or information. A key strategy is to categorize each group for the best program that you are evaluating. This reliable strategy involves the comparison of data relating to the same issue of investigation but from different perspectives and stages of research, such as interviews, observations and document analysis. The data is therefore crosschecked in order to confirm the hypothesis. Data triangulation can reflect disjunctions in the research results as well as provide additional insights. It can provide a way to overcome deficiencies intrinsic to a single-investigator, single-site, single theory, single-method, or single-unit of analysis, but the strengths will only be realized when care and attention are paid to addressing underlying issues (Mitchell, 1986).

Procedures

Choosing the Topic

For the past four years, I have studied and worked as a graphic designer in the Midwest where I also attended college majoring in graphic

communications. As a professional graphic designer and as a student of graphic communications, I have experienced numerous incidents and discussions related to the topic of "good" design, how it is learned, and how it is created and produced. Many of the occurrences have interested me. For example, a student once said to me, "Adding color always adds more to a design." In contrast, I have learned from instructors, clients and from my own personal experience that color can, at times, be a distracting element in a project depending on the design, message and purpose.

Having graduated in the field of graphics and now working as a graphic designer, I know how I learn about and create graphic designs. As a graduate student, I am interested in knowing how others learn about and create graphic designs. For this study, I wanted to discover and understand how undergraduate college students learn about and create graphic designs. I believe that my study will be useful research for other designers, educators and myself.

Negotiating Entry

My inquiry began by contacting the instructor of, and selecting students enrolled in, an entry-level graphic design class. I received permission from the instructor to attend the first day of class to distribute information about my study and ask for student volunteers. Consent forms were given to the 16 students enrolled in this entry-level graphic design course. The consent forms briefly

described my research, the expected time commitment, need for volunteers, and contact information. After answering questions, all 16 students agreed to participate in my research.

During the initial, individual meetings with the students, I explained that I would observe each of them in their classroom environment twice a week for six weeks. I explained that during the observations I would record field notes and have access to educational documents that pertained to those observations including the syllabus, handouts, and assignment sheets. In addition, I clarified that I would interview each participant two times during the six-week period. Each participant agreed with the conditions and signed the participant consent forms. (See Appendix A)

Description of Setting & Participants

This study was conducted on the campus of an Upper Midwestern university. The college is situated in a community with a population of approximately 50,000 people. The university is the flagship research university in the state and serves more than 13,000 students. It grants bachelors, masters and doctoral degrees.

The Department of Technology, originally established in the late 1800s as the Department of Industrial Arts, offers three main areas of study: manufacturing, electronic and computer hardware, and graphic

communications. The number of majors in the Department of Technology is approximately 125.

The Department of Technology offers entry-level graphic design courses to all university students, regardless of their majors. The subjects for this study, eight male and eight female, were recruited from the Department of Technology's Principles of Graphic Design and Print Production class.

The following briefly describes the study participants:

1. 15 students were classified as seniors or junior; one student held sophomore status.
2. 9 participants were majors in Industrial Technology and were enrolled in the class because it was a requirement for their degree.
3. 3 participants were majors in Graphic Communications and enrolled in the class because it was a requirement. They were also interested in learning about the subject.
4. 4 participants were majors in degrees other than Industrial Technology or Graphic Communications and were enrolled in this class because they were interested in the subject.

Data Gathering Techniques

Time at Site

The study was introduced during the fourth week of instruction in the fall semester of 2003 at the Upper Midwestern university. Once the consent forms were discussed, signed, and collected, study participant observation took place. Formal data collection began the sixth week of class where I observed each participant in his or her classroom twice a week for six weeks. I also conducted interviews during these established days and times. The first interview was conducted during the first week of observation and the second interview was conducted during the sixth week of observation.

I spent approximately three hours each week during the six-week study observing the 16 participants in the study. A total of 18 hours of observation was recorded. There were interviews conducted at the beginning of the study and at the end totaling a number of 32 interviews conducted. The 32 interview sessions ranged in length from 10 minutes to 25 minutes for a total of approximately 4 interview hours.

Participation Observation

A great deal of data collected for the study came from classroom observations. I quietly observed the setting, participants, events, actions and interactions as a passive participant in the classroom. I designated a special

binder for the study and recorded notes that I observed. To clarify interpretations, notes and observer comments were also recorded.

At the end of each observation day, I reviewed and wrote out my notes. At this time I would think about the day's events by noting any questions, thoughts or perceptions that had developed during that day. This critical self-reflection was executed for potential biases within the study.

One problem that arose during my observation was directly related to the setting of the site. Although the classroom was sufficient for listening to the participants, it was not favorable to visually observing the participants at all times. I took the role of an active observer who observed half of the class period in the front, right area of the room to view the participants' facial expressions and half of the class period in the back of the room to witness visually how the participants were developing their designs. I did have difficulty observing some student's facial expressions, and what and how they were designing their pieces.

Interviews

During the six-week study period, I interviewed each student two times. The interviews took place in a private office near the classroom to make sure the responses were kept confidential and to not distract the other students. The interview area was a non-threatening environment.

The interviews were open-ended and the tools employed were simple: a notebook and a pen. During the students' initial interviews I asked the same introductory questions of each participant: "What is your definition of design?" and "What do you believe makes a design an effective one?" (See Appendix B) During the students' final interviews I asked questions of each participant to verify what they learned about graphic design. (See Appendix C)

To stress the importance of the participants in this study, I tried to express the status of my role as a minimum one. I did this by stating, in different ways, that I was there to learn from them.

Coding Procedures

According to Creswell (2003), data analysis is an ongoing process during research. He writes:

> "Data analysis involves analyzing participant information, and researchers typically employ the analysis steps found within a specific strategy of inquiry. It involves interpreting the data in the light of personal lessons learned, comparing the findings with past literature and theory, raising questions, and/or advancing an agenda for reform" (p. 205-206).

On the same day after the interviews were completed, I transcribed my field notes, keeping in mind the questions: What is happening here, why is it happening, and what does it represent? I stuck to the same timely process during the second interviews and observations.

Creswell (2003) encourages qualitative researchers to analyze their data for material that can yield codes that address topics that readers would expect to find, codes that are surprising, and codes that address a larger theoretical perspective in the research. "Researchers can generate codes for this description. This analysis is useful in designing detailed descriptions for case studies and narrative research projects" (Creswell, 2003, p. 193). I initially organized the data into categories: how students learn, how technology affects student learning, and student comprehension of the materials discussed in class. Descriptions from my field notes were divided into different categories. Because I am a visual learner, I divided and laid out the data in bubble sheets to obtain a better understanding of how each category was important and how they were linked to each other. (See Appendices D, E, F, G, H, & I) Then, I used the categories chosen to generate patterns and themes.

Once the initial themes were written, each piece of raw data was reviewed to determine if it supported or did not support the themes. When the themes were identified, the study participants were asked questions to verify the accuracy of the data analysis. Feedback was important to the validity and reliability of my study because it confirmed what I had observed in the classroom and read in the professional literature. Data triangulation is

significant to the justification of this study. The final themes of this study are discussed in detail in Chapter IV.

CHAPTER IV

THEMES AND DISCUSSION WITH REFERENCE TO LITERATURE

The purpose of this study was to understand how students learn about and create entry-level graphic designs. Chapter III describes the setting, the participants selected for the study, the methods and procedures used to conduct the study, and the collected data needed to identify the patterns or themes. In this chapter, I discuss the three major themes of the study, the data supporting each theme and a discussion of the literature related to each theme.

The patterns or themes were discovered through data analysis, which includes participant interviews, observations in the college classroom environment, and analysis of students' projects. The general categories that emerged during this study include background information, learning style, perceived problems with technology, approaches to design and acquired knowledge of course content. The data was sorted and coded, then studied for themes. The following three themes emerged:

1. Students' approaches to learning affected their learning.
2. Students' knowledge about technology affected their learning.
3. Students' acquired knowledge affected the creation of their designs.

Theme One: Students' Approaches to Learning Affected Their Learning

Students' approaches to learning appear to vary among students. Though they were all taught the same material in class, the learning styles differed for each student. Based on what I observed, students learned primarily by visual, auditory, and kinesthetic modes-better known as learning modalities. These three basic modalities process information to memory: visual (learning by seeing), auditory (learning by hearing), and kinesthetic (learning by doing). Most students have one predominant modality, but some have a balance between two or even all three. Many students are aware of their preference, which helps them approach their own learning more effectively (Learning Modalities, 2000).

In addition to modalities, students learn in combination with other approaches and methods that affect their acquired knowledge of design. Some examples of the approaches and methods observed that affect student learning are researching, brainstorming, questioning, trial and error and social learning. These methods and approaches are associated with the learning modalities but are more specific in their intention.

Visual Learning

A visual learner is someone who learns best by using their eyes to see information (Slagle, 2003). They learn best by seeing words and numbers printed

in text form, or by using graphics and pictures, observing real life objects and events, and using maps, charts, graphs, and other visual aids.

Student "A"'s motivation for taking the entry-level design course was because of personal interest and she felt that it would help her career. She stated that learning to apply knowledge on her own, in a creative manner, was important to her. This quality was interpreted as valuing independent thinking and the outcomes that reflect that independence. Student "A" appeared as though she placed a great deal of importance on her independence, her personal learning strategies, and her learning abilities.

Student "A"'s approach to learning was reflective of her independence and determination to learn. She was observed as a pleasant, yet serious, dedicated learner. Student "A" appeared to prefer visual learning and hands-on learning experiences rather than a lecture (auditory) format of instruction.

> On many occasions I observed Student "A" taking notes of classroom materials that the instructor would present or discuss in class. The instructor introduced and was discussing the anatomy of fonts. During this discussion I observed Student "A" looking through her book required for class. She appeared to be reading about fonts and studying the examples provided in the textbook. As the instructor continued her lecture she displayed examples of font anatomy on the overhead projector.

Student "A" appeared to study the examples and was observed writing them down. Once the lecture was over, the instructor handed out an assignment to the students, requiring them to identify the anatomy of fonts.

As Student "A" began to work on her assignment, I observed her looking at the textbook. She appeared to be reading and studying the information on fonts. Student "A" completed her assignment with the help of her textbook and her notes taken during class.

On many occasions I observed Student "A", as well as several students, searching the Internet. I first thought of it as a distraction or saw it as a lack of motivation, but it appeared she was, in fact, researching. Student "A" asked the instructor, "What are some good sites to search for photos?" The instructor praised Student "A" for her important question, she proceeded toward the white marker board that was at the front of the classroom, and wrote down several sites for students to search.

I thought Student "A" was procrastinating during the in-class time the teacher gave the students to work on their assignments, but it appeared that she was researching ideas, graphics or photos, and information concerning her chosen project topic.

During one of my interviews with Student "A", I brought up the issue of her style of learning. She responded,

> "I have always been a visual learner and have learned by doing. Class lectures are kind of boring for me without visual aids so I tend to take notes to keep my attention or read the material in the textbook so that I can visually review what was said in class."

Student "B"'s motivation for taking the entry-level design class was to fulfill a degree requirement needed for his major. He stated that he was not very creative, and that he was a little intimidated by the class and the work involved. Student "B" appeared as though he could be a reserved student, for of his lack of confidence he had about design and about being creative. He did, however, express his pursuit to learning new things and that he was very excited and interested in learning about design.

Student "B"'s approach to learning was reflective of his personality and outlook of education. He was observed as one who strived to learn as much as he could. Student "B" appeared to prefer visual learning and hands-on learning experiences rather than a lecture (auditory) presentation.

While observing Student "B" in class, I noticed that when working on his assignments, besides searching the Web, Student "B" would brainstorm his ideas and transcribe them onto his notebook. He would then look at his notebook and what he had written down. It appeared that

Student "B" was reviewing the ideas that he had brainstormed; possibly choosing which idea he wanted for his project. He returned to his computer and continued to search the Internet. Once he found an image or graphic he was interested in, it appeared Student "B" would then illustrate his ideas by drawing thumbnails[1] on his notebook. Student "B" seemed to analyze his different designs based on the specifications of the assignments as he was observed reading the instructor's assignment.

When I shared this observation with Student "B" during an interview, he clarified that he is a visual learner and that it was easier for him to come up with his designs if he could see different layouts and ideas. He said,

> "I tend to get into a rut when it comes to being creative and brainstorming – writing ideas down on paper – helps me gather ideas and thoughts about the assignment. Once I'm done brainstorming, I organize my ideas into ones I'd like to explore and others that don't work for the assignment. I produce thumbnails so that I can get a visual picture of what I want to see as the finished product. I'm not very good with design programs so I figured if I had an idea set in mind it would possibly be easier to layout since I have the idea already."

I observed 16 students during this study and it appeared that 13 of 16 students practiced visual learning as one of their chosen learning styles. Reading, repetition (writing down lecture notes), and observing demonstrations are examples of visual learning as observed with Student "A". Student "B"

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[1] Thumbnails are small, rough drawings of images which represent larger images and ideas in design.

performed examples of visual learning by writing down ideas and illustrating thumbnails for his assignment. Although this modality may not have been the students' primary style of learning, 13 students verbally agreed to have learned by "seeing".

Discussion: Visual Learning

Student "A" and Student "B" both considered themselves visual learners. In addition to observing their learning modalities they both expressed other ways of learning. Student "A" took notes during class while she is listened to the lecture, taking notes allowed her to see and produce (write) the information. Student "A" relied heavily on the textbook to help her learn. While the instructor lectured about new class material, Student "A" would jot down notes and follow along in her textbook. The course textbook is one more tool that aids in student learning. Student "B" would brainstorm and write down his thoughts to gather ideas for his projects. Brainstorming works by focusing on a problem, and then coming up with radical solutions to it (Mind Tools, 1999). Ideas should deliberately be as broad and odd as possible, and should be developed as fast as possible. Brainstorming helps you break out of your thinking patterns into new ways of looking at things. After brainstorming, Student "B" would review his list of ideas and produce thumbnails to see his ideas on paper. Both Student "A"

and Student "B" researched their projects to gather photos, ideas, and additional information on topics for their design.

Visual learners make up about 65 percent of the population (Mind Tools, 1999). Visual learners relate most effectively to written information, notes, diagrams and pictures. Typically they will be unhappy with a presentation where they are unable to take detailed notes–to an extent information does not exist for a visual learner unless it has been seen written down. This is why some visual learners will take notes even when they have printed course notes on the desk in front of them. Some effective techniques for visual learners are demonstrations, charts or graphs, movies, color-coding information and flash cards (Learning Modalities, 2000). Visual learners tend to be most effective in producing written communication and symbol manipulation.

Auditory Learning

An auditory learner is someone who learns best by listening and talking (Slagle, 2003). They take in information best by their sense of hearing. They learn reading and other subjects by listening to someone present information orally and by being allowed to discuss the topic and ask questions. Some auditory learners also learn best by involving music and sound effects into their learning experience.

Student "C"'s motivation for taking the entry-level design class was to fulfill a degree requirement needed for his major, but he also had a personal interest in the subject of design. He stated that learning new things, whether it had to do with his major or not, was fun and would help him become a stronger learner and a well-rounded, educated student. This quality was interpreted as valuing self-determination by facing new challenges that are not directly needed for his degree. Student "C" appeared as though he placed a great importance on learning new subjects, his personal learning strategies, and his learning abilities.

Student "C"'s approach to learning was reflective of his interest in the subject of design. He was observed as sociable, energetic, and a good listener. Student "C" appeared to be a strong-minded student who was determined to learn as much as he could.

> While observing Student "C" in class, I noticed that he liked to socialize with other classmates, but when the instructor spoke, whether she was lecturing, explaining something to another student, or demonstrating a particular process, he would stop socializing, turn and look at the instructor and listen to what she was saying. He appeared to be interested in everything the instructor was saying or doing in class. At first I thought his attention toward the instructor was a distraction, but after several observations it appeared that Student "C" was interested in

learning from the instructor. It appeared as though his learning style was auditory.

On several occasions I observed Student "C" interacting with the instructor and the other students. He consistently asked questions and appeared to be seeking approval from the instructor and his fellow classmates. During one class session, Student "C" was designing on his computer and appeared to be frustrated with the software program. This was evident by the scowl across his face and his body posture was hunched. Student "C" noticed what his classmate seated next to him was designing and became interested. After several minutes went by, Student "C" asked the student sitting next to him how he created a background with a linear gradient. The student sitting next to him graciously demonstrated and described what he did to create the background. Student "C" observed the screen as the classmate demonstrated the process, but he appeared to be listening to his classmate's instructions rather than watching him demonstrate.

When I shared this observation with Student "C" during an interview, he clarified that he is an auditory learner and that he prefers to learn by asking questions and listening to responses. He explained,

> "When I was growing up on the farm it was pretty much just me, my dad and my uncle who worked it. There was a lot of work to be done and my dad didn't always have time to show me how to do certain tasks or how to operate certain machinery so he just had to tell me how to do it. Of course I had a lot of questions and was pretty scared at times not knowing exactly what I was doing, but I learned. As I grew older, I accumulated more responsibility on the farm and worked side-by-side with my dad. Still to this day, whether it is work or learning in school, I learn best by listening and asking questions of others."

Student "K"'s motivation for taking the entry-level design class was to fulfill a degree requirement needed for his major, though he had an interest in art and computers and wanted to know more about graphic design. He stated his interest for art and computers in the subject has motivated him to learn about design. This quality was interpreted as valuing personal independence by exploring interests not needed for his degree.

Student "K"'s approach to learning was motivated by his interest in art and computers. He was observed as outgoing, vigorous, and a good listener. Student "K" appeared to be a self-determined student who was interested in learning what he was interested in.

> On many occasions I observed Student "K" interacting with classmates around him; he was asking questions and contributing to discussions. On one occasion I observed Student "K" working on an assignment. He was observed reading the assignment and the requirements from the instructor's handout out loud to himself. As

Student "K" started the assignment he sighed, appearing frustrated with the project. I observed Student "K" asking the student seated to his right for clarification about the assignment. The student sitting next to him turned to Student "K" and pleasantly answered his question. They then continued to discuss and critique ideas about the assignment and which design would work best.

When I shared this observation with Student "K" during an interview, he clarified that he learns best by talking and listening to others. He referred to himself as an auditory learner. He explained,

> "All my life I have been a social person. I have always talked my way through situations and learn best by talking to others. Talking to others allows me to get instant feedback; I can translate their words into my own and ask questions about anything I don't understand until I do comprehend the information being presented. I also learn by repeating things to myself. I can't just read a book silently. To completely focus on the literature I have to read the information out loud. I recall information better when I can hear it."

I observed 16 students during this study and it appeared that 8 of the 16 students practiced auditory learning as one of their chosen learning styles. Asking questions, enjoying lectures, and preferring verbal instructions are examples of auditory learning. Though this modality may not have been the students' primary style of learning, six students did verbally agree to have learned by "hearing".

Discussion: Auditory Learning

Student "C" and Student "K" considered themselves auditory learners. They were both observed asking questions and contributing to discussions in class. Student "C" felt strongly that learning experiences, while growing up, could shape how you learn, as you get older. Student "K" believed he could recall information better if he could hear it; therefore he read out loud or discussed questions or ideas with other students.

Auditory learners make up about 30 percent of the population. They relate most effectively to the spoken word. These students will tend to listen to a lecture, and then take notes afterwards, or rely on printed notes. Often information written down will have little meaning until it has been heard – it may help auditory learners to read written information out loud. Some effective techniques for auditory learners in addition to reading aloud, are group discussions and repeating ideas orally (Learning Modalities, 2000). Auditory learners may be sophisticated speakers, and may specialize effectively in subjects like law or politics (Mind Tools, 1999).

Kinesthetic Learning

Kinesthetic learners learn best by moving their bodies, and activating their large or small muscles as they learn (Slagle, 2003). These are the "hands-on

learners" or the "doers" who actually concentrate better and learn more easily when movement is involved.

Student "D"'s motivation for taking the entry-level design class was to grasp basic principles of design to further her education in the field of graphics. She stated that she was highly interested in learning about the principles and elements of design and believed she would learn more from the instructor because she heard she was a good teacher. Student "D" appeared to be independent and strong-minded because she has had some previous experience with design. She placed a great deal of importance on her own knowledge and ideas of design, and her own learning abilities.

Student "D"'s approach to learning was reflective of her personality and determination to learn more about the subject of design. As I observed, she appeared friendly, inquisitive and as a strong-minded learner. Student "D" appeared to prefer working independently and jumping right into an assignment.

On several occasions I observed Student "D" working on a graphic design computer software program as the instructor was discussing the assignment and what the requirements were to the class. She appeared to ignore the instructor's lecture and began working on the project.

As Student "D" worked on her project, she did not ask the teacher any questions about the assignment. She sat at her computer station and worked quietly developing her design.

On many occasions I observed Student "D" working intensively on a particular design. She would arrange the elements on the page as to how she wanted them to look, took a minute to review and analyze the design, and would rearrange the elements to form an entirely different look. Student "D" appeared to be an active learner who would design a piece, print it out as a proof and make any further adjustments needed to complete the assignment. Once she was satisfied with the end result she would then ask for the instructor's attention, hand her a proof of the design and ask, "So, what do you think of this?" The instructor acknowledged Student "D"'s previous design experience and replied, "This is a very good start, but I think it's a little too busy. You need to keep it simple. Remember when we talked about KIS (Keep It Simple)? You want the elements to be clean and clear, but strong and effective." Student "D" accepted and agreed with what the instructor said, and returned to her workstation to review her design.

During one of my interviews with Student "D", I brought up the issue of her style of learning. She responded,

> "I'm a visual learner, but even more so I'm a hands-on learner (kinesthetic). I prefer to jump right into a project as ideas come to mind. I tend to remember things better when I apply or practice certain ideas, processes or different procedures."

Student "L"'s motivation for taking the entry-level design class was to fulfill a degree requirement. He stated that he has a passion for computers, but didn't know much about design. Student "L" appeared to be self-sufficient and positive because of his attitude during class. He said that he has no experience with design; he is interested in computers and finds graphic design fascinating.

Student "L"'s approach to learning was motivated by his passion for computers and his interest in learning about design. As I observed, he appeared independent, constructive and social. Student "L" appeared to learn through experience and physical activity.

> On many occasions I observed Student "L" assisting others with class assignments. He would demonstrate how to use a particular tool in a program or how to perform certain tasks (i.e. scanning). Student "L" was observed testing tools in design software programs that weren't demonstrated or discussed in class. He appeared to be interested in learning more about the design programs and explored the tools and features on his own.

During one of my interviews with Student "L", I brought up the issue of his style of learning. He responded,

> "I tend to think I am a visual learner or a hands-on learner. To read information in a book or listen to a teacher lecture does not interest me to learn. I like the experience of working with and doing what was talked about. I like to help others because in a way it is a form of learning. When I demonstrate something to another student I become even more familiar with the tools and functions in the design programs."

I observed 16 students during this study and it appeared that 8 of the 16 students practiced kinesthetic learning as one of their chosen learning styles. Participating in activities, preferring action, and trying new things are examples of kinesthetic learning. Though this modality may not have been the students' primary style of learning, eight students did verbally agree to have learned by "doing".

Discussion: Kinesthetic Learning

Student "D" and Student "L" both considered themselves kinesthetic learners. Student "D" believed, quite strongly, that she learned and retained information best when she was an active learner. Student "L" believed he learned through experience and physical activity; he learned from teaching others what he knew.

According to Mind Tools (2000), kinesthetic learners make up about five percent of the population. Based on my study the number of kinesthetic learners

was 50 percent, a significantly greater number than what was referenced in literature. Kinesthetic learners learn effectively through touch and movement and space. They learn skills by imitation and practice. Some effective techniques for kinesthetic learners are experiments or labs, problem-solving, field trips and physical examples (Learning Modalities, 2000). Predominantly kinesthetic learners may sometimes appear slow, in that information is normally not presented in a style that suits their learning methods (Mind Tools, 1999).

Additional Factors that Affected Their Learning

In addition to visual, auditory, and kinesthetic learning, the student participants in my study were affected by physiological factors at some point during the observation. The physiological factors that will be discussed are classroom environment, student interest and attitude, attendance, and deadlines.

The classroom environment appeared relaxed, it was well lit, each student had a considerable amount of personal space at his or her computer station, and there was music playing in the background. There were four workstations in each row and four rows occupying the classroom; each computer station was in use during the class. The mood in the classroom appeared laidback and comfortable.

Student "E"'s motivation for taking the entry-level design class was to fulfill a degree requirement needed for his major. He said that he had no

previous knowledge of, or experience with design and was a little nervous because he didn't know what to expect from the class. Student "E" was observed as a reserved, independent learner who appeared to practice the bare minimum to get through the class.

Student "E"'s approach to learning was reflective of his lack of interest in the subject. As I observed, he appeared self-sufficient, distant, but indolent. Student "E" appeared to learn through experience and visual learning.

> From the very beginning of my observation in this study it appeared that Student "E" had an perceptible attitude when present in the class, and the material being taught and learned seemed to bore him. Whenever the instructor was presenting new material or discussing an assignment he would sit at his computer station with his head rested upon his hand, staring at his computer screen. During the instructor's presentation, I noticed Student "E"'s attention was focused on several different Internet sites such as: his email account, ESPN[2] sports, and EBAY[3], instead of listening to the instructor. Student "E" appeared to be focused on other non-class activities, seemingly not paying attention to the instructor or the assignment being announced to the class. When the

[2] ESPN is the leading provider of sports on the Internet. This site is located at www.espn.com.
[3] EBAY is an online trading site where people can put items online for sale and others will bid on them. The site is located at www.ebay.com.

instructor was done presenting a new assignment to the class and asked if there were any questions, only then would Student "E"'s attention be directed to the instructor with a slightly annoyed look upon his face. He never said anything or asked any questions when the instructor was presenting and discussing class material.

Student "E"'s initial interest in the class and learning about design was nonexistent. When I shared this with Student "E" during an interview he stated that he was taking this class to fulfill a requirement for his degree and that he had no actual interest in learning about graphic design. The subject was not interesting enough for him to put much effort into learning it or creating his designs.

As mentioned earlier, Student "E" was observed searching the web during the class time provided by the instructor. With this approach to learning, it appeared that students worked by themselves on their assignment and the teacher would help them if they had questions. As the deadline for the assignment grew nearer, just days away, Student "E" would open up the design program and produce a design in about 20 minutes. He would print it out and approach the instructor with his project. He would ask her, "What do you think of this?" Since the instructor moved around the classroom while students are working on

their designs, she was aware of the students' approaches and progress. The instructor appeared to have a disappointed look on her face as she reviewed Student "E"'s design. It appeared that the instructor knew that his work ethic was poor, but nonetheless gave a polite response to Student "E" saying, "I think this is a good start, but you need to reexamine some of the elements on the page and be more aware of the message you are trying to illustrate to your audience." Student "E" listened to the instructor's suggestions and comments and returned to his workstation. He appeared to be frustrated, puzzled or bored as he stared at his computer screen for several minutes, attempted to make some adjustments and finally shut down his computer leaving the class early.

During an interview with Student "E" I asked him, "I know that you have said you are not interested in the subject of design; do you think your lack of interest may affect your learning and application of the materials?" Student "E" replied,

> "I need this class for my degree so I have to pass it, but my lack of interest in the subject does play a role in my involvement. I think that my indifference about design affects my attitude, which leads to a lack of participation on my part.

Student "E" was recorded absent a couple of days during my observation time. According to the instructor, when a student is absent from class it is his or

her responsibility to complete the assignment by the due date as stated in the class syllabus[4].

During an interview with Student "E" I asked him, "What do you do when you are absent from class and a deadline is approaching?" Student "E" thought about it for a moment and replied,

> "When I'm not in class working on the assignment during the days the instructor gives us to work on them, I tend to rush my designs when I attend the next class period. I don't do any work outside this class on my assignments so I would have to say that my designs suffer due to lack of attention."

Student "F"'s motivation for taking the entry-level design class was to fulfill a degree requirement needed for his major. He said that he had no previous knowledge or experience with design, but was excited to learn something new and challenge himself. Student "F" was observed as a confident, determined learner eager to tackle new projects.

Student "F"'s approach to learning was reflective of his personality and how he looked at learning new subjects. As I observed, he appeared sociable, cooperative, and committed to learning. Student "F" appeared to be a dedicated student who had a positive attitude and appeared to work hard on his assignments in class.

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[4] The class syllabus was distributed during the first week of class.

On several occasions I observed Student "F" snapping his fingers to the music that played in the background. He would tap his feet to the beat of the music. He appeared relaxed and seemed to enjoy the music. Student "F" moved to the beat of the music while working on his assignment, but did not appear distracted by the music.

I questioned Student "F" about the classroom environment during an interview and he explained,

> "I feel very comfortable in the classroom and enjoy working next to other students. When I'm having a creative block I can look at what my neighbor is doing to try and spark some original thoughts of my own. One thing that is cool about this classroom that I don't experience in any other classroom is the music. It is relaxing when you're working on a project, because if there was just silence I think the mood would appear more tense in here."

On many occasions I observed Student "F" working by himself on his assignment. He appeared to be a sociable, hardworking student who took great interest in his assignments. Student "F" was observed numerous times printing out his design and critiquing it over and over before a deadline was due. He would make adjustments to his design and critique it again and again. Student "F" appeared to be a perfectionist. As an assignment deadline drew nearer his behavior began to change. He was observed as edgy and impatient. Student "F" appeared to be so

anxious that he would bounce his left leg up and down as he scrambled to make any last minute changes; keeping a close eye on the clock.

When I referred to this incident with Student "F" during an interview, he explained,

> "When I look at my designs I always see something that can be improved. When it is coming down to the wire and the deadline is up, I tend to get a little jumpy because I want to make sure it is perfect when I hand it in. I love getting class time to work on our projects, but the deadlines are very nerve racking."

I observed 16 students during this study and it appeared that 16 of the 16 students were affected by additional factors when learning. Classroom environment, student interest in design, attitude toward learning design, attendance, and project deadlines are additional factors that can affect student learning. Though the students had very little control over these factors, 16 students verbally agreed that the additional factors affected their learning.

Discussion: Additional Factors that Affected Their Learning

The data in this study suggests that personal factors affect student learning. There were 14 of 16 students in the study who agreed that their interest in design, attitude toward learning design, attendance, classroom environment, and project deadlines had an affect on how a student learns. All of the study participants agreed that the teaching methods and feedback of their instructor during class were helpful, positive, and effective. Additionally, they were aware

that the personal factors did not affect all students in the same way. Each day may have brought new feelings and emotions, which in turn would affect how students learn.

Student "E" was not interested in the subject or learning about the subject of design. Not being interested in the subject that is being taught can lead to difficulties in learning about the subject. It appeared that his lack of interest in the class brought on a poor attitude, which led to his poor work habits. Student "E" was not the only student who displayed this behavior during the class; three other students shared Student "E"'s attitude about the subject of design.

Student interest can be sustained and diminished via classroom social forces, one of which is instructional communication (Kerssen-Griep, 2003). Kerssen-Griep (2003) found that communication studies and educational research together identifies that classroom goal structures, instructional strategies, teacher immediacy, and classroom environments are established as social influences on students' learning motivations.

> "Research has demonstrated that classroom environments affect learning when teachers help students feel that they self-initiate and self-regulate their own actions (are autonomous), understand and feel efficacious about personal learning activities (are competent), and develop secure and satisfying personal connections with others" (Kerssen-Griep et al., 2003, p. 359).

According to Kerssen-Griep (2003) such states influence student interest and are nurtured in classroom environments that offer optimal challenge, interpersonal involvement, acknowledgement feelings, choice-making opportunities, chances to evaluate their own learning, and informational, mastery-oriented, "nonthreatening" feedback.

Entwistle (1981) reported that interviews conducted by Paul Ramsden in 1979, had systematically explored students' perceptions of the departments in which they worked. Entwistle (1981) stated the interviews verified that students made it clear that their approaches to learning are very much affected by their interest in the subject. Methods of assessment perhaps have the greatest effect on student's study strategies. In many of the interviews both interest and previous knowledge were clearly factors, which affected their learning (Entwistle, 1981). If anything, interest was seen as more important by students in design, while students who were in more business or technical based programs mentioned previous knowledge more frequently.

Attendance can be a large factor that affects student learning. When students are in class they are present to acquire knowledge associated with the subject being learned and if help is needed students can make use of the instructor's assistance. When they are absent, they lose out in gaining that knowledge or one on one attention with the instructor.

In Chi's (1993) study concerning factors affecting attendance and adult education short courses, the study demonstrated that attendance rate correlates significantly with student expectation and classroom environment while attendance rate does not correlate with self-esteem (Chi, 1993). According to Chi (1993) classroom environment is defined as the "personality" of the environment, as opposed to its physical and human aggregate characteristics. The teacher, students, course level, and their interaction, thus leading to distinctive attitudinal and behavioral norms, socially construct the environment.

As observed, Student "F" appeared to experience a form of anxiety when working on an assignment to meet the deadline. After Student "F" turned in his assignment he appeared to be more relaxed and cheerful again. Student "F" was not the only student who appeared to get "worked up" over deadlines. I observed about four other students whose behavior changed when an assignment was due at the end of the class period.

To many students deadlines are seen as a threat to their achievement (Nelson, 1999). Nelson (1999, para. 4) reported these anxieties generally stem from some underlying fear of failure or of being rejected. Worry and anxiety can become a habit that is hard to break and we may become anxious about feeling anxious. On the other hand, some students enjoy deadlines. It is not the

situation itself, but the way we think about it that makes students feel anxious or worried (Nelson, 1999).

Theme Two: Students' Knowledge of Technology Affected Their Learning

During my study I observed that technology played a vital role in student learning. In this theme I discuss the students' knowledge and attitudes toward technology that was implemented during this class.

"It is hard to complete an assignment effectively when you don't know the programs that well," said study participant Student "D". "I get frustrated when I know what I want the design to look like, but because I don't know the tools and functions of the programs, I fail to create it right," said Student "G". "The design programs we work on in class are incredible. There are so many features; so many things you can do within the programs to advance your design," said Student "C". "Technology can be a great tool in education, but when it doesn't work correctly I get very angry. The worst thing to have happen is to spend hours on an assignment and the computer crashes or locks up only to realize that you did not save your work," said Student "L".

Student "G"'s motivation for taking the entry-level design class was a personal interest; she wanted to learn more about design and the software used to create the designs. She had previously worked with Microsoft Publisher

software, but wanted to expand her knowledge of programs because she had an interest in layout design and was devoted to the learning the subject.

Student "B"'s motivation for taking the entry-level design class was to fulfill a degree requirement needed for his major. He stated that he was not very creative, and he was a little intimidated by this class and the work involved. Student "B" appeared as though he could be a reserved student because of the lack of confidence he had about design and about being creative. He did, however, express his pursuit to learning new things and that he was very excited and interested in learning about design.

Student "B"'s approach to learning was reflective of his personality and outlook of education. He was observed as being one who strived to learn as much as he could and appeared to be an enthusiastic learner who enjoyed learning new things.

> On numerous occasions Student "B", and all of the other students, had to print out their assignments and hand them in to the instructor. On this particular day, Student "B" appeared to be preparing to print out his project as the class period was coming to an end and today was the deadline for the assignment he was working on. He sat at his computer station, gathered all of his papers and other materials, and returned them to his school bag. Once he was done cleaning up his workstation he

headed toward the printer to pick up his printout. To his surprise, there was no printout at the printer. He checked the status of the printer and appeared to have a disappointed look on his face. He returned to his computer and printed his assignment once again. This time he hung around the printer to monitor its working status.

Several minutes passed by and Student "B"'s frustration showed as he banged on the printer's buttons and moaned in disgust. He called for the instructor to come help him. "I've been trying to print my assignment out for about 15 minutes and nothing is happening. This is the second time I've tried to print it and it doesn't even seem to be responding." The instructor looked at the printer, told Student "B" that the printer is probably overwhelmed with too many print jobs pending. Student "B" rolled his eyes, appeared aggravated, and returned to his computer.

Aside from the printer, Student "B" was observed having additional problems with technology. He was observed having problems with his zip disk[5].

On one occasion, I observed Student "B" struggling with his zip disk. It appeared that he could not open the disk to retrieve the files located on the disk. He appeared livid as he punched the keys on his

[5] Zip disks are removable storage mediums used for Macs and PCs.

keyboard, trying to get the disk to respond. After he struggled with the disk for several minutes he appeared to have given up and planned on starting over as he opened a blank page in the design program.

When I shared what I observed with Student "B" during an interview, he said,

> "Technology can be such an aid in life to everyone; it is amazing. The computer software programs we are working with are remarkable; I can't believe what we can do with them. The Internet is a great source for researching. But when you run into a technical problem, that is when technology becomes an obstacle. Technology can be a hassle. If you think about it, we depend on technology so much that when it doesn't work correctly we end up aggravated and furious; it is as if we can't do anything without it."

Student "G"'s approach to learning was reflective of her interest in communicating visually and expanding her knowledge of design software. As I observed, she appeared independent, composed, and committed to the course material and its work. Student "G" appeared to be fascinated about learning the fundamentals of graphic design.

On several occasions Student "G" appeared to be frustrated when working on a design. She would draw something on the computer, erase it and attempt to draw it again. Her frustration appeared to take over as she gave up and asked the instructor for help. "How do I draw a heart in this program?" asked Student "G". The instructor identified which tool

would help her create a heart and demonstrated how it worked. While she watched the instructor work with the tool in the program, Student "G"'s face lit up and appeared to be intrigued with what the instructor had showed her.

When I shared what I observed with Student "G" during an interview, she said,

> "I get frustrated when I know what I want the design to look like, but because I don't know the tools and functions of the programs I fail to create it right. Working in new programs is difficult because I don't know its tools or its abilities well enough to produce an excellent design. I feel limited with what I can design because I don't know much about the programs we are using for the assignments."

On one occasion, I observed Student "G" scanning in a photo. She had her "How to Make a Scan" handout, given to her by the instructor, in front of her. She placed the photo on the scanner and made a few clicks with the mouse to activate the scanner. It appeared that Student "G" saved her image on her disk. Once she was finished, Student "G" removed her disk from the computer, returned to her computer station[6], and opened up the disk to find the file. Student "G" was able to open the file, but appeared to have trouble with the photo. She turned and

[6] There were only two scanners in the classroom hooked up to two computers. Students had to share the scanners.

complained to the student on her left. Student "G" closed out of the file, removed the disk from the computer, and returned to the scanner.

When I shared what I observed with Student "G" during an interview, she said,

> "We went over how to scan in class and I understand what the size and resolution is supposed to be for a printed image. I even understand how the scaling ratio works, but I've never worked with a scanner before and had a hard time understanding what to change or adjust to end up with my anticipated product. It is one thing to have to learn the course material, but having to learn new technology is an even bigger matter to learn."

I observed 16 students during this study and it appeared that 11of the 16 students lacked knowledge of the computer design software used to complete the class assignments. During this study 6 of the 16 students appeared to have problems with technology and I observed a change in their attitude because of the troubles. Though technology is an excellent tool for classes and students, 11 students verbally agreed that they felt limited because they did not have much knowledge of the design programs. Six students verbally agreed that technical problems caused them frustration and a change of attitude about learning.

Discussion: Students' Knowledge of Technology Affected Their Learning

The data in this study suggests students' knowledge of technology affects student learning. All of the study participants agreed that technology is an effective tool in student learning, but not knowing or understanding the

technology can cause frustration and difficulties in learning. All of the study participants agreed that the Internet is a valuable tool in researching their assignments. Additionally, they agreed their attitude and understanding of design was affected because of technical problems.

Student "G" became irritated and overwhelmed when she was unable to design what she had in mind. In this incident, technology was seen as a limitation based on the lack of knowledge the student had of the computer design programs.

Schacter (1999) conducted a study on the impact of education technology on student achievement. In this study he found that learning technology is less effective or ineffective when the learning objectives are unclear and the focus of the technology use is diffuse (Schacter, 1999). Schacter (1999) discussed that students in technology rich environments experienced positive effects on achievement in all major subject areas, and students' attitudes toward learning on their own self-concept improve consistently when computers were used for instruction.

Schacter (1999) found that students learn more in less time when they receive computer-based instructions. Schacter (1999, para. 8) reported the "students like their classes more and develop more positive attitudes when their

classes include computer-based instruction. However, computers do not have positive effects in every area in which students were studied."

During the observations that I conducted for this study to understand how students learn about and create designs, computers were used during instruction by the instructor, but only for a few specific demonstrations. Students were observed learning the different computer design programs (Adobe PageMaker, Adobe Illustrator, and Adobe Photoshop) by completing particular assignments used to teach the tools and abilities of each program. Students completed the assignments, but it appeared they were not able to learn everything about the design software programs based on one program assignment.

"As the International Society for Technology in Education (ISTE) points out, technology helps students become deft 'information seekers, analyzers, and evaluators; problem solvers and decision makers; creative and effective users of productivity tools; communicators, collaborators, publishers, and producers'" (Billig, 2003, para. 6). Technology helps students become informed, responsible, and contributing citizens (Billig, 2003). Technology then can be an effective instructional tool for increasing student achievement. In general, ISTE revealed that students' achievement is best enhanced when students first master basic operations and concepts of technology and understand ethical and responsible

use, then begin to use technology as a productivity tool, for communication, for research, and for problem-solving and decision-making (Billig, 2003). Billig (2003, p.12) stated, "Since technology is heavily infused in daily life, students tend to have a wealth of knowledge of its real-world application."

Though technology is highly implemented in today's society, where the Internet may be a way of life for some, many students find learning to use technology daunting. Students who are not familiar with technology can feel left behind (Russell, 1996). Special attention needs to be given to ensure students learn without loosing self-esteem and without dropping out all together.

Russell (1996, para.8) reports that Kolehmainen (1992) suggested computer anxiety might have negative effects when learning new technology because of a resistance to change or lack of knowledge.

> "If this is so, it may be important to identify for learners a relevant purpose for learning, which reflects and reinforces their current values. Involving students in a relevant task where the technical processes are merely a means to an end, may lead to overcoming computer anxiety earlier" was also reported by McInerney (1994, p. 47). This author suggested that researchers focus on "building confidence and a sense of personal control in a non-threatening learning environment, individualized if necessary" (McInerney , 1994, p. 47).

It appears the processes of learning to use computers can cause a decrease in self-esteem. Russell (1996) reports that when learning new technologies, some students without extensive computer experiences are afraid of damaging

equipment. Others, in hindsight, enjoy this challenge and continue to capably move beyond this stage. Most students find working with others is extremely valuable for providing moral support. Apart from peer support, learning new technologies requires extensive technical positive encouragement according to Russell (1996).

Student "B" became frustrated with the printer and the zip disk when they failed to work properly. Because of the failure of technology Student "B"'s attitude changed from to being productive to being lazy. In this incident, technology was seen as a problem based on the technical problems the students experienced. Technology can be an excellent aid in everyday life, but when problems arise, it may become a serious dilemma. When technical problems occurred in class the students appeared to experience a couple of emotions: extreme frustration when there appeared to be no logical explanation for things going wrong and annoyance about the amount of time wasted.

Access to new technology includes problems with obtaining and maintaining hardware and software, as well as scheduling the use of the technology (Hunter, 1998). All too often, equipment is difficult to set up, and often breaks down. Hunter (1998) says this is clearly the case with computers that crash due to hardware and software conflicts. Despite the frequency of such problems, the vast majority of universities do not hire full time computer staff.

Theme Three: Students' Acquired Knowledge Affected the Creation of Their Designs

During my study I observed that students' acquired knowledge about design affected the creation of their designs. In this theme I discuss the fundamentals, principles and elements the students utilized to produce their designs. I also discuss what the participants believed made an effective design, why a good design was important, and what they believed influences today's designers.

The class project the students were assigned, and what I observed, was a poster design. In a sense, all posters are designed to sell something–a cause, a craze, a car, concert tickets–and often there is a story behind their creation. Students were to design a poster that would be serious, significant and of social relevance. The design size required was 8.5 inches by 14 inches. Students were to work in the PageMaker[7] design program for layout and type, the Illustrator[8] program to adjust any line art or logos, and the Photoshop[9] program to adjust photographs.

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[7] PageMaker is an Adobe design program used for primarily for layout.
[8] Illustrator is an Adobe design program used to produce original graphics, logos, and other various arts.
[9] Photoshop is an Adobe design program used to adjust, crop, color correct, or manipulate photos.

Throughout the study, I observed the course content taught to students by the instructor about the basics of design and the elements and principles that accompanied design. What do the students believe is needed for an effective design?

Student "E"'s motivation for taking the entry-level design class was to fulfill a degree requirement needed for his major. He said that he had no previous knowledge of or experience with design and was a little nervous because he didn't know what to expect from the class. He was observed as a reserved, independent learner who appeared to practice the bare minimum to get through the class.

Student "E"'s approach to learning was reflective of his lack of interest in the subject. As I observed, he appeared independent, distant, but lacking in work ethic. Student "E" appeared to learn through experience and visual learning.

> I observed Student "E" applying course content information to his design, and noticed that he began by doing some research on the Internet to find the right photograph. It appeared as though he was searching for something to do with oceans or lakes. He let out a moan, threw his head back and stared at the ceiling. It appeared as if Student "E" was frustrated in his researching for a photo. Student "E" returned to his computer and

to the Internet. It appeared as though he was looking for a new image for a new topic. The image he chose was an illustration of a forest. After saving the image to his computer he placed it on a blank page in PageMaker. He positioned the image slightly above the center of the page and added a thick black boarder around the photo. He then created a headline that appeared way too large above the photo, and a subheading underneath the photo along with contact information. He added a brilliant red background color to the design, printed it out and walked over to the instructor. He handed her his design and said nothing. She took a look at it and said, "You have too many elements competing with one another. You either need to make the headline smaller or the photo smaller because right now they are competing for attention." Student "E" appeared to agree with the instructor as he nodded his head up and down. He returned to his desk and made a few more adjustments on his design.

When I shared what I observed with Student "E" during an interview, he said,

> "My first idea was to do something with marine animals, but I couldn't find the right photo so I decided to change my idea. I looked on the Internet for photos and found one on a forest. Once I found that photo I chose to do my poster on forests and wildfires. I wanted to keep the design simple and direct. The photo didn't really grab my attention at

first so I decided to insert a red background to make the design more visually appealing."

During the interview with Student "E", I questioned what he believed to be the strongest element of design and what makes a design an effective one. Student "E" thought about it for a moment, looked at his poster and said,

"I think the strongest element in a design is the photograph or text (if there isn't a photo). I think that pictures create a connection with people and grab their attention more than text does. I believe that an effective design is one that stands out from its competitors and produces results; that's the only way one would truly know if it is an effective design."

When asked if he would do anything different to his poster he said,

"I think that the design is good, but it needs the right audience. There are no forests or wildfires around here and therefore this message won't be too appealing to the people of the community. I like my design. I think it's very strong and powerful, just like wildfires."

I then asked Student "E" if he believed there were factors that influence designs in general. He replied, "Yeah, I think technology influences today's designs, along with current events, different audiences, and other designs. Pretty much everything."

Student "J"'s motivation for taking the entry-level design class was of personal interest, and noted that she was also taking the class for elective credits. She was observed as appearing to be a calm and focused learner who enjoyed the class very much.

Student "J"'s approach to learning was reflective of her interest in the subject of design. As I observed, she appeared to be intelligent, nice, and devoted to learning graphic design.

As Student "J" worked and pieced together her design, it appeared that she knew what her idea and message was going to be. She searched the web researching several different photographs until it appeared that she found the perfect one she was looking for. Student "J" chose an image that was strong and filled with emotion. Once she saved the image, she opened up her design program and placed the image on the blank page. I observed Student "J" experiment with several designs with different positions of the photo, different angles, all of which created a different mood. It appeared that she came to a conclusion as to where she was going to place the image on the page. Based on this observation, Student "J" appeared to pay close attention to the angles she was creating within her design. The photograph was of a human, blurred enough to give you a silhouette of a person, who was facing her right side. Student "J" appeared to take advantage of the direction the photo created and positioned her text next to where the photo's supposed eyes would be; creating direction. Once she was done creating her first draft, Student "J" asked the instructor for her advice. "Do you think this is good, or what

should I do differently?" The instructor looked at the design and appeared to be impressed by the student's work. "This looks really good (Student "J"). I would consider eliminating some of the space between the headline and the subheading so that they are more connected; other than that, I think it is an excellent design."

Student "J" kept the colors very simple within her design: blue, purple and black. The poster, overall, consisted of a photograph, a headline and sub-headline, and contact information. The fonts she chose were contrasting, yet simple.

Student "J"'s approach to learning was reflective of her interest in communicating visually and expanding her knowledge of design software. As I observed, she appeared independent, composed, and committed to the course material and its work. Student "J" appeared to be fascinated about learning the fundamentals of graphic design.

When I shared what I observed with Student "J" during an interview, she said,

> "I got the idea right away and jumped on the Internet to find a photo for my design. My poster was about breast cancer awareness. It informed women that it was important to get checked out more than once a year. I was looking for a strong visual photo that was dynamic, yet simple. I was very happy with the image I chose. The image was a silhouette of a naked woman who was looking down to her right. The instructor taught us to keep our designs simple (KIS) so that it was clear to the audience what the

> message was. I kept the headline short and bolded it to grab the reader's attention. The subheading gave a little more information about the message and contact information was provided for any further questions. I chose the colors, black, blue and purple, because they were emotional to me and they are not colors associated with the feminine body that much. I thought it would grab the reader's attention, as well."

During the interview with Student "J" I mentioned that she appeared to feel strong about grabbing the reader's attention in her design, but wanted to know what else was important to her about her design. She explained,

> "The first thing I wanted to accomplish was grabbing the reader's attention, the second was to convey an important message to a specific audience. The issue I chose was a very serious matter for all women and I wanted the design to be dark and professional looking to convey this serious message."

While interviewing Student "J" I asked her what she thought of first when she was creating her design. Student "J" replied,

> "I first read about the requirements needed for the assignment, so that I didn't forget anything. I wanted the design to be interesting, and attention-grabbing. I thought about the message I wanted to convey and then started doing some research to find the photograph. Everything else was just kind of trial and error. I did, however keep in mind the rule of thirds, which I displayed quite nicely I think."

When asked if she would do anything different to her poster Student "J" responded,

> "I personally am very happy with my design. I know there is always room for improvement with every design, so I maybe would change the way the contact information is laid out; I would arrange it differently so it gets more attention."

I asked Student "J" if she believed there were factors that influence designs in general. She said,

> "Oh, I think there are a lot of factors that influence today's designs such as: fashion, pop culture, politics, the media, sexual appeal, society and even culture. I think my poster was somewhat influenced by a personal reason. My aunt had just been diagnosed with breast cancer and this triggered the idea of my poster. The design was influenced from another ad I had seen in a magazine."

I observed 16 students during this study and it appeared that all 16 students used acquired knowledge to create their poster designs. Though the students acquired the course knowledge in different ways, 16 students verbally agreed to use the course material in class to produce their designs.

Discussion: Students' Acquired Knowledge Affected the Creation of Their Designs

The data in this study suggests that students' knowledge affects the creation of their design. All of the study participants agreed it is important to have a strong design so that it grabs the attention of its audience. All of the study participants agreed that photographs are a dynamic element in design. Additionally, they agreed that there are several factors that can influence a design.

To gain insight into how much students actually understand, and what they have learned by working the problems, the students need to discuss the evolution of their ideas as they work on assignments (Koker, 1996).

The learning outcome from a particular course or particular assignment has surrounding layers of influences: from the student's prior knowledge and the student's approach, to the task in hand. The student's approach will be influenced certainly by the nature of the medium, but also by the logistics–of the hardware, how it is arranged in a room, whether the accompanying notes are available, whether there is sufficient time allotted, and how many are in the class (Laurillard, 1997). Other influences are by how they view the teacher–as supporter or hindrance, as controlling or facilitating–and also by what they think the assessment of this task will be. Additional factors such as whether the students get a mark for it, how much it will count, and what they have to do to get a good mark influence a student's understanding and learning. The students' approach is influenced to some degree by their own motivation in the subject (Laurillard, 1997).

Tang (2002) believes although it may be difficult to ascertain the validity of student self-reported strategies used in projects, the visual results of the assignment can still provide the basis for appropriate intervention. It is proposed that intervention aiming at helping students understand design requirements should adopt a metacognitive approach where students are given a chance to reflect on their current practice, recognize more desirable alternatives, and actually practice using the strategies designed to produce a more analytical

response. Tang (2002) reports that Biggs & Collis (1982) believed the intervention program needed to encourage content and design analysis and problem representation at a relational level prior to content inspection. Paying attention to detail of the assignment should be encouraged to produce a more focused search, and most importantly the program needs to emphasize the shift of responsibility from teacher to student to allow them to continue the strategy both independently and in assessment situations (Tang, 2002).

Cherry (2001) reports the purpose of studying Gestalt is to gain a better understanding of the underlying principles that structure composition. This understanding enables the designer to skillfully construct a composition that is more engaging to the audience.

"Gestalt" is German for "form; shape; pattern; configuration; or the way a thing has been placed or put together" (Cherry, 2001). Gestalt is also the name for a 20th-century school of psychology that studies perception. The primary rule for Gestalt is that "the whole is different from the sum of its parts." The essence of the whole cannot be surmised from an analysis of its parts (Cherry, 2001, para. 4).

According to Cherry (2001), the opposite of Gestalt is atomism. Atomism is a focus on the importance of the deconstruction of the whole and the analysis of fundamental elements to gain a greater understanding of the whole. Put

them together and you can kind of get a grip on what you are doing. Understand the parts. Understand the whole. Understand the relationship between the parts as they construct the whole. Understand that the whole has a new and separate identity from the totality of the parts. "Looking at the elements of a composition, if they work together to create a unified aesthetic is said to possess "good Gestalt," according to Cherry (2001, para. 6).

Having already interviewed the students at the beginning of the study and observing them for six weeks, I had a good notion of what they learned, but needed to verify my perceptions by asking them questions about their designs to see if what I perceived was accurate. I had assessed the students' poster designs (See Appendices J, K, L, M) to verify what they had learned. The mark of a good assessment is that it not only provides information about what the students know, but it challenges the students to develop deeper understanding (Volkmann, 2003).

Student "E" appeared to have grasped what is entailed of a good design, based on what was taught in class. His design, too, contained all of the elements: lines, strong photo, color, text, a strong message, balance and direction. But it was not as effective as Student "J"'s design. When interviewing the other students about creating their designs, I asked them if they believed their own designs were effective. Forty-four percent of the students revealed that their

designs could be stronger and with more time they could have improved them a little more.

Student "J" appeared to have grasped what is entailed in a good design, based on what was taught in class. Her design incorporated all of the elements: lines, strong photo, color, text, a strong message, harmony and direction. When interviewing the other students about creating their designs and what they thought were the most important elements. Ninety-three percent said that grabbing people's attention and conveying a clear message were the most important things that make designs effective.

Assessment is a task that challenges students to share their thinking about the concepts being explored (Volkmann, 2003). This sharing provides opportunities to the teacher to detect growth and to students to construct evidence-based explanations.

Summary

In Chapter IV, three themes emerged in this study: 1) students' approaches to learning affected their learning, 2) students' knowledge about technology affected their learning, and 3) students' acquired knowledge affected the creation of their designs. Data supporting each theme and discussion of the literature relevant to each theme was provided.

make pg. 90

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

The purpose of this study was to understand how students learn about and create entry-level graphic designs. There were 16 students and one teacher that participated in the research. In the study 15 of the 16 students were juniors or seniors and one student was a sophomore. The participants had different approaches to learning, different attitudes about technology, learning about graphic design, and were working toward different degrees.

Qualitative methods were used to study the college learning experiences of the participants. The triangulation method, used to check and establish validity in research studies, included participant observations, interviews, and document analysis. The observations and interviews focused on students' approaches and attitudes toward student learning, knowledge and attitudes of technology, and students' acquired knowledge to affect the creation of their designs. The data analysis focused on whether or not there was conformity regarding the apparent themes.

Participants' stories were told using a format that provided the reader with the following information: (a) background, (b) students' motivation, (c)

approaches to learning, (d) observations, (e) discussions of learning styles, (f) knowledge of technology, and, (g) acquired knowledge of graphic design. Following the background information, observations and project analyses of the students was noted. Three themes emerged during the research. The themes are listed and summarized as follows.

Theme One: Students' Approaches to Learning Affected Their Learning

This theme was reinforced by the literature on student learning preferences through observation and interviews. The learning modalities (visual, auditory, and kinesthetic) described by each student and additional factors appeared to affect student learning.

Student "A" and Student "B" both considered themselves visual learners. Student "C" and Student "K" considered themselves auditory learners. Student "D" and Student "L" considered themselves kinesthetic learners. All of the study participants agreed that they learn class material using different methods, i.e. visual, auditory and/or kinesthetic, at different rates, and by combinations of modalities. Additionally, the participants agreed that the learning methods were not *as* successful if they were not interested in the subject being studied.

During the interviews the participants expressed they had different approaches to learning. All participants were observed asking questions and contributing to discussions in class. Whereas Student "A"'s learning style was

observed as more visual and auditory, Student "B"'s learning style was observed as more visual and hands-on. Student "A" was observed as a pleasant, yet serious, dedicated learner and Student "B" was observed as outgoing, determined, and enthusiastic to learn as much as he could.

Student "C" was observed as sociable, determined, and curious to learn as much as he could. He appeared to be a more auditory and hands-on learner. Student "K" was observed as outgoing, and a good listener. He appeared to have a positive attitude about the subject, and appeared to be a self-determined student who was interested in learning what interested him. Student "C" believed strongly that learning experiences while growing up could shape how you learn as you get older. Student "K" believed he could recall information better if he could hear it, therefore he read out loud or discussed questions or ideas with other students.

Student "D" was observed as friendly, inquisitive and an independent learner. During the observations Student "D" appeared to be a more active learner. Student "L" appeared to be self-sufficient and positive because of his attitude during class. During the observations Student "L" appeared to learn through experience and physical activity. Student "D" believed, quite strongly, that she learned and retained information best when she was an active learner.

Student "L" believed he learned through experience and physical activity, i.e. he learned from teaching others what he knew.

Additional factors were demonstrated to affect student learning. Student "E" and Student "F" confirmed different attitudes while learning about graphic design. Student "E" was observed as a reserved, independent learner who appeared to practice the bare minimum to get through the course. He expressed that he had no interest in learning design and therefore, put forth little effort on his assignments. Student "F" was observed as a confident, determined learner eager to tackle on new projects. He expressed great enthusiasm and interest throughout the entire study, though he would have his days of frustration as well. Student "F" appeared aggravated when a deadline was approaching and knew he was running out of time to work on his assignments. All of the study participants agreed that their interest in design, attitude about learning design, attendance, classroom environment, and project deadlines had an effect on how a student learns. The feedback received from the participants regarding this theme was supported by data analysis.

Theme Two: Students' Knowledge About Technology Affected Their Learning

This theme was supported by the literature on technology's effect in a classroom. Though technology was seen as a primary tool used in the class, technical problems would occur causing students' to become frustrated and

annoyed. Students' knowledge and attitudes of technology were discussed with reference to literature.

Student "G" and Student "B" were observed experiencing limitations regarding educational technology. Student "G" was observed as witty and charming, and she appeared to engage the material in class. She had some previous experience with computer design programs but expressed that she felt limited because of her lack of knowledge about the programs used in this course. This limitation affected her attitude and she appeared irritated several times during my observations. As mentioned earlier, Student "B" was outgoing, determined, and enthusiastic to learn as much as he could. He was observed having technical problems with the printers. These technical problems appeared to upset him and the more the problems occurred the more upset he got.

All of the study participants agreed that technology was an effective tool in learning graphic design. They also agreed that not knowing or understanding the technology caused frustration and difficulties in learning. The study participants agreed that the Internet was a valuable tool in researching their assignments. Additionally, they agreed that technical problems affected how students learned because of the lack of knowledge students possessed, and their attitudes toward student learning. The observations, interviews and project

analyses received from the participants regarding this theme supported my interpretation of the data.

Theme Three: Students' Acquired Knowledge Affected the Creation of Their Designs.

This theme was supported by the literature on understanding and acquiring course material discussed in class to help students create their designs. Through observations, interviews, project analyses, and literature review I verified that students' acquired knowledge affected their learning and ability to create effective graphic designs.

Student "E" and Student "J" were observed demonstrating similar design skills with the knowledge acquired in class. As I observed, Student "E" appeared independent, distant, but lacking in work ethic. Student "J" was observed as a calm and focused learner who appeared to enjoy the class very much. She appeared to be intelligent, friendly, and devoted to learning graphic design. Both Student "E" and Student "J" appeared to grasp what was involved in a good design, based on what was taught in class. During interviews, 44 percent of the students revealed that their designs could be stronger and with more time they could have improved them. When asked what they thought were the most important objectives of graphic design, 93 percent of the study

participants said that grabbing people's attention and conveying a clear message was significant to creating effective designs.

Conclusions

Learning

Two aspects of this study were the learning styles and attitudes of students, and the impact they can have on student learning. Students generally favored one mode (visual, auditory, kinesthetic) of learning rather than all three. Learning styles in combination with one another were demonstrated to be a stronger learning strategy that allowed students to adapt to the instructor's teaching style. This research was an indication that a student's learning style affected their learning.

This study also indicated that additional factors affected student learning. Student attitudes were affected when students appeared to lack interest in the subject being taught. Because of a lack of interest, the student's effort to learn and participate was less.

Classroom environment appeared to affect participant learning. Students' attitudes appeared to be affected by the atmosphere of the classroom. The classroom appeared neat and organized, music played in the background, and the students appeared to be comfortable during the observation period. The

participants who placed a great deal of emphasis on deadlines appeared to experience anxiety, which affected their attitudes and/or participation.

Technology

Another aspect this study conveyed was that students' knowledge about technology affected their learning. Although the Internet was a valuable tool for researching assignments, the study participants agreed that technology problems affected student learning and attitude toward learning.

This research suggests that technology may be an effective tool in how students' learned, but not knowing or understanding the technology caused frustration and difficulties. In computer-enhanced courses students experience positive effects on achievement in all major subject areas, and students' attitudes toward learning can independently improve consistently when computers are used for instruction. Technology, then, could be an effective instructional tool for increasing student achievement. In the information age where the Internet is a way of life for some, many students find learning to use technology daunting. Attitudes about new technology can create negative effects when learning the new technology causes a resistance to change or lack of knowledge.

This study indicated that when technology problems occurred in class the participants experienced emotions of frustration and annoyance. They became

frustrated when there was no logical explanation for things going wrong and annoyed about the amount of time wasted.

Acquired Knowledge

Another aspect this study conveyed was that students' acquired knowledge affected the creation of their graphic designs. The study participants agreed that there were several factors that influenced designs. The learning outcome from a particular course or particular assignment had surrounding layers of influences–from students' prior knowledge and their approach, to the task at hand. The students' approaches were influenced to some degree by their own motivation in the subject. Demonstrated in the study, I gained insight about what students understood and what they learned by discussing the evolution of their ideas.

According to Volkmann (2003) assessment is a task that challenges students to share their thoughts about the concepts being explored. This study indicated that when students discussed their work with me they explained their understanding of design. Understanding the underlying principles that structure a composition enable designers to skillfully construct a composition that is more engaging to the audience. This sharing provided opportunities for me to detect acquired knowledge and for students to construct reasonable explanations.

Recommendations

The following recommendations are provided to college teachers and students who teach or learn graphic design in the classroom. The recommendations are also relevant to higher education administrators, and to business and industry personnel.

1. Evaluations of student learning preferences can improve teacher-student relationships and affect positive learning.
2. The use of student learning preference evaluations should be encouraged and accepted as a positive teaching and learning tool.
3. Students have to consider the teacher's approaches to teaching and adapt them to their own method of learning.
4. Teacher's and students' perceptions of learning methods used in the classroom should be assessed, respected, and valued.
5. Evaluation of students' knowledge about technology can address which students need more attention in learning the programs.
6. Student knowledge about technology should be assessed and considered when assigning projects and when using computer programs.
7. Teacher and student perceptions of technology used in the classroom should be assessed, respected, and valued.

8. Assessments must be made in order to understand if students are learning what is being taught.
9. Students need to assess their own work to better understand graphic design.
10. Administrators must support teachers and students by providing access to new educational technologies and computer design programs, thus keeping up with business and industry.

Recommendations for Further Study

In this thesis I have examined the way students learn about and create entry-level graphic designs. This research was completed to understand how students learn about designing, though there were many other factors concerned with understanding how students learn about and create their designs that could be explored. For example, much more study is needed on the various learning approaches of students and how students acquire knowledge to create their designs. Researching more entry-level classes with various teachers would allow a researcher to compare and contrast ideas making the study more credible. Another facet of this study that could be researched is the location of the students during the class. Does the classroom environment, even where a student is seated, have any affect on how a student

learns and understands the material presented by the teacher? The possibilities to expand on my research exist and are numerous.

As I end the process of writing my research, I am reminded of how important this journey has been. Having graduated with a graphics degree I remember when I was first introduced to graphic design. It was exciting to learn the elements, principles, and rules of design, not to mention the computer programs used to create the designs. As did some of the students in this study, I also felt overwhelmed and frustrated at times.

At the beginning of this research, I remember walking into the classroom for the first time, nervous, but excited. I remember how effective the process of observing, interviewing and gaining valuable feedback from the participants was. During the observations and interviews I remember thinking that I could relate to the study participants' learning approaches, attitudes, knowledge of technology and knowledge of acquired material. The relationships with the participating students and teacher were both constructive and gratifying. It is intriguing to learn how designers come up with their ideas and how they create their designs.

This research has changed me in various ways, but most importantly it has made a significant impact on how I think about designers. Every time I look at a magazine or brochure I am reminded of the importance of graphic design. I

am reminded of how important it is to learn and understand the fundamentals, principles, elements, and tools used to learn and create graphic designs. Because of this study, I believe I am a better designer, striving to learn more about design and how designers create their designs.

APPENDICES

APPENDIX A
Participant Consent Form

Reference #: _____

Information and Consent Form

The purpose of this study is to understand how students learn about and create entry-level graphic designs.

Principle Investigator: Jacalyn Urbaniak | _____
Master of Science | Department Technology
_____ | _____ | jaciu@hotmail.com

Good Day! My name is Jacalyn Urbaniak and I'm a graduate student in the Master of Science program at the _____. My research interests include various aspects of design, especially graphic design, and teaching and learning of design. The purpose of this study is to try and understand how students learn and create designs for print and electronic design production. The primary aims of the proposed research study will be to fortify the curriculum development at the _____, thus advance students' future academic and career potential, and strengthen economic development in _____.

You are invited to participate in this research that will benefit educators in learning more about how students choose designs, about developing and assessing curriculum, and about professional development opportunities—thus furthering knowledge.

The research will be conducted at _____, room 235 in the Department of Technology 212 class: Principles of Graphic Design and Layout at the _____. A visit will be made to the Technology 212 class to verbally inform the students of the upcoming research study. After reading through the "Information and Consent Form" with the students, the signed forms will be collected and recorded (participation being voluntary), and distribute a list of questions to interview them. The participants will be interviewed to gather their basic knowledge of design, their interest in the subject of design, and any experiences he or she may have had with print or electronic design production. Once the data is collected from the interviews, the researcher will attend six class periods to observe the instruction and action that goes on during the class. After completing the observation, the researcher will observe and analyze an in-class design project. The in-class project is one that is assigned and required by the instructor. The project is to design an advertisement that informs or tries to persuade the reader about a controversial issue. When the project is complete the investigator will analyze the data and field notes and conduct an exit interview to clarify and/or confirm the initial questions, observations and data analysis.

Every precaution will be taken to ensure that there are no risks involved for you. The results of this study will be confidential, and the number assigned to you will be known only by the investigator to identify the data. There will be no way to identify you as a subject. All records, including consent forms, field notes and interview data, will be kept separately and in a safe place in my home where only I will have access to them. They will not be used for any other purpose than this research and will be destroyed three years following the completion of the study. Participation is voluntary you may discontinue participation from the study at any time. Whether or not you participate in this study will in no way reflect your relationship with the _____.

Research participants will not receive monetary compensation for their participation in this project. In addition, you will not incur any expenses related to your participation in this research.

The investigators involved will be available to answer any questions or concerns you may have about this study. You may contact the principal investigator by calling Jacalyn at _____, or the investigator's advisor by calling _____ at _____. If you have any other questions or concerns, please call the Office of Research and Program Development at _____.

You will be given a copy of this form.

Upon request, you will be informed of the findings of this study.

I have read all of the above information and willingly agree to participate in this research explained to me by Jacalyn Urbaniak. I understand that I may discontinue participation at any time without prejudice, that all of my questions have been answered and that I am encouraged to ask any questions that I may have concerning this study in the future.

_____

Participant's signature Date

I have discussed the above points with the subject. It is my opinion that the subject understands the benefits, risks and obligations involved in participation in this study.

_____

Investigator's signature Date

APPENDIX B
Student Preliminary Interview Questions

Reference #: _____

Preliminary: Interview Questions
The purpose of this study is to understand how students learn about and create entry-level graphic designs.

Complete each of the following questions regarding your knowledge of design, interest in the subject, and experiences you may have had with print or electronic design productions.

1) What year are you classified at the University of North Dakota?

2) What is your major?

3) Why are you taking the Technology 212 class: Principles of Graphic Design and Layout?

4) What is your definition of design?

5) What is your interest in design?

6) As a designer, what do you think of when creating a design?

7) What experiences have you had with print or electronic design productions?

8) What factors do you believe influence today's designers?

9) What do you believe makes a design an effective one? (example: design principles, balance of elements, colors, copy, etc.)

10) Why do you believe a good design is important for print and electronic design productions?

11) When creating a design, what do you see to first when preparing for your design?

12) What frustrates you the most when creating a design?

APPENDIX C
Student Final Interview Questions

Reference #: _____

Exit: Interview Questions
The purpose of this study is to understand how students learn about and create entry-level graphic designs.

Complete each of the following questions regarding your advertisement design project. Explain your answers in detailed sentences. Attach a printed copy of your final ad design.

1) What is the message of your advertisement?

2) Do you believe your ad is an effective and strong advertisement? Why?

3) When starting this project, what was your first idea for the design? If there was a change, why did you do so?

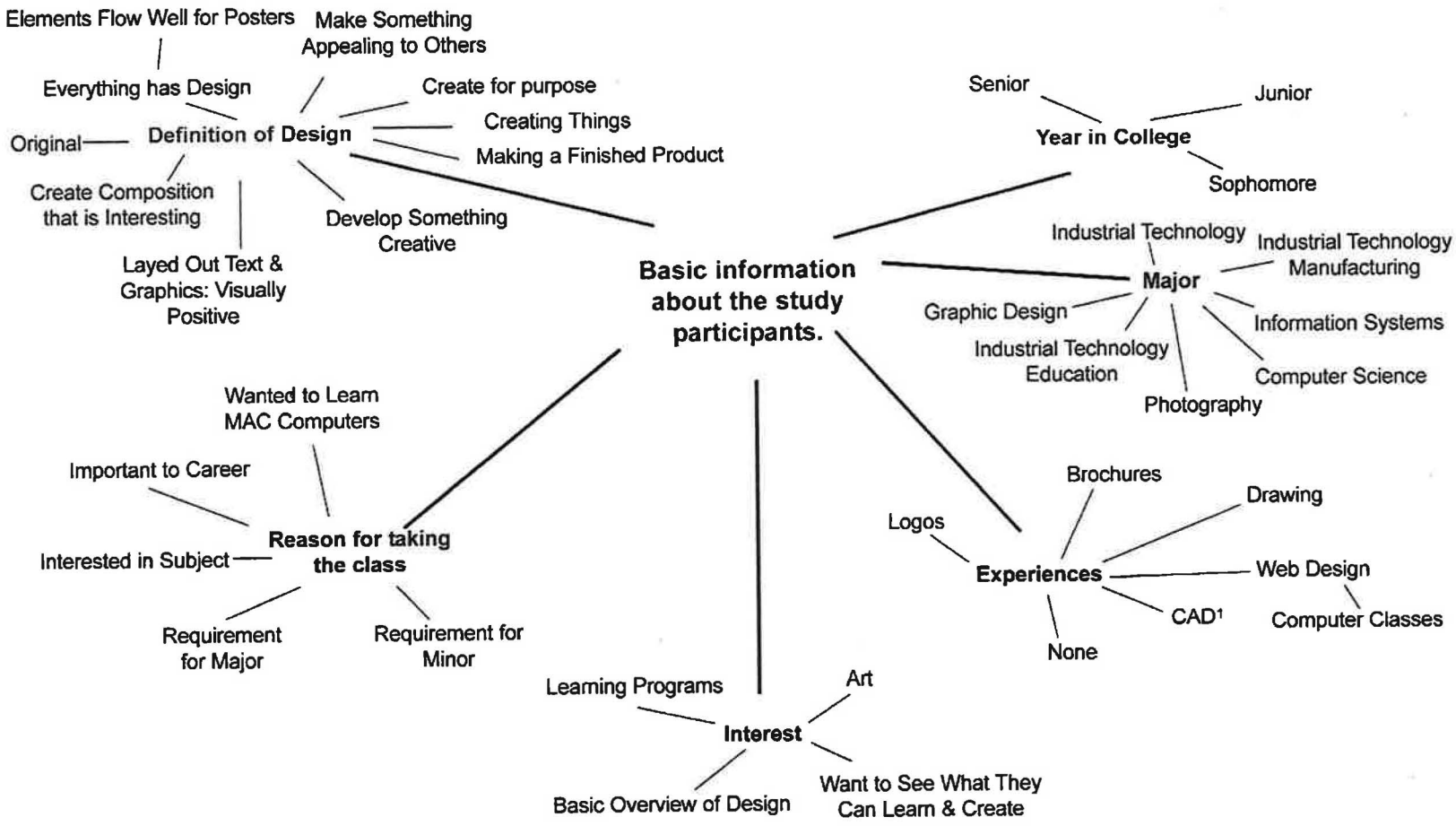
4) What design principles or elements did you incorporate in your design?

5) Why did you choose the final design that you did?

6) What factors helped you to form/assemble your final design? (For example, materials discussed in class (principles, elements), ads previously seen on the subject, personal preference, working with others) Be specific.

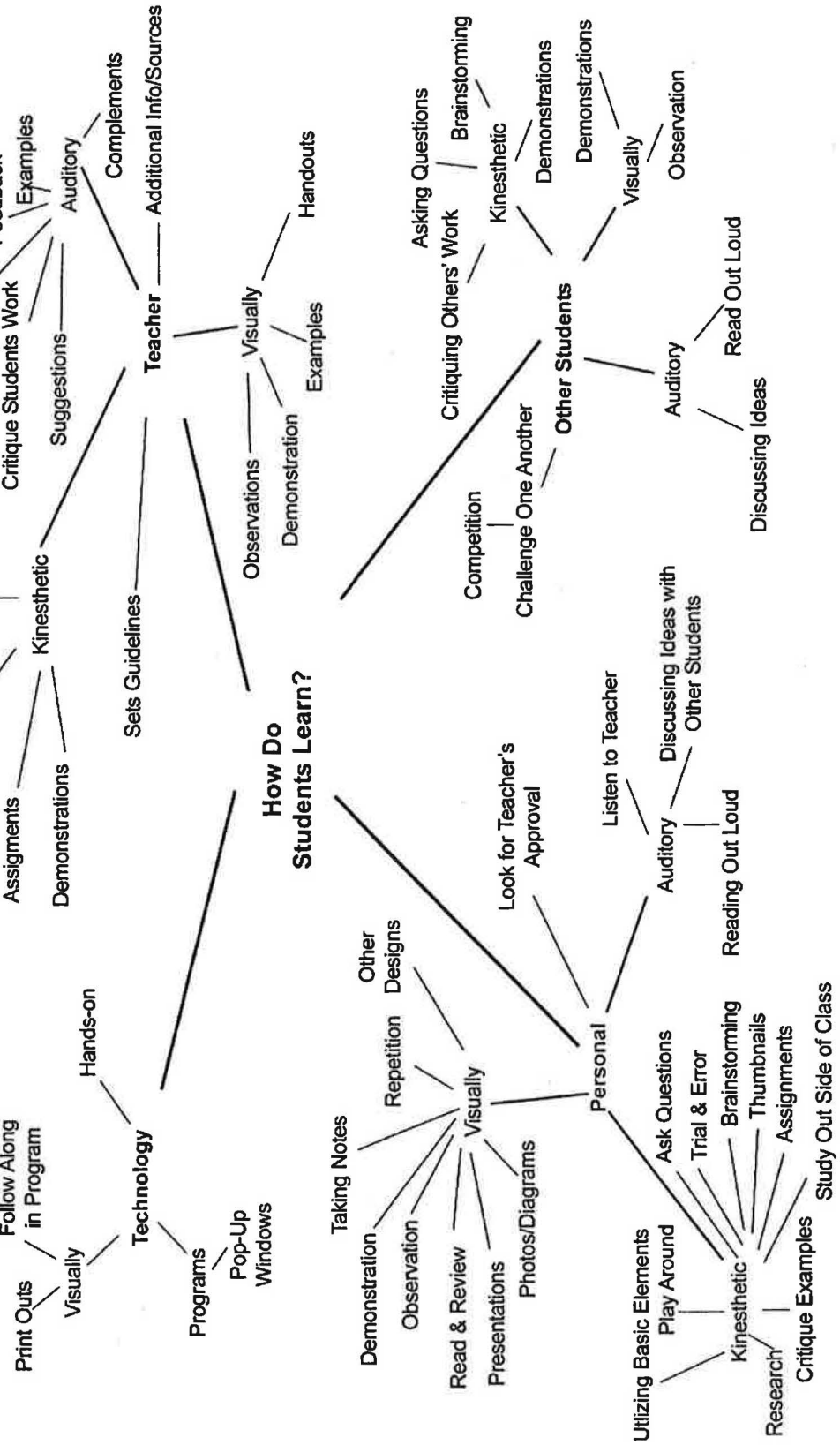
7) What did you enjoy or dislike about this project?

8) If you were to do the project over, what would you do differently with your advertisement?

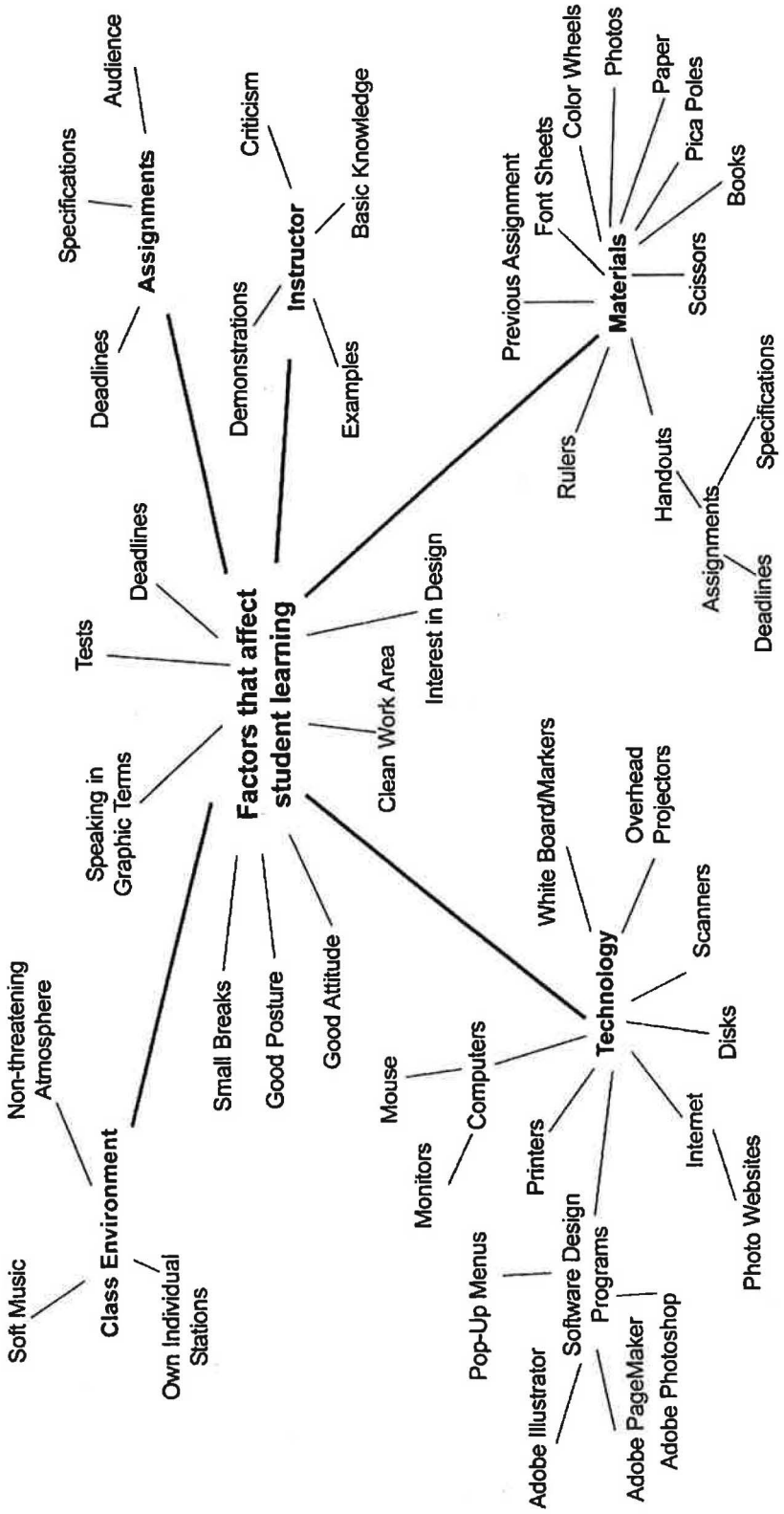


[1] Computer Automated Drawing

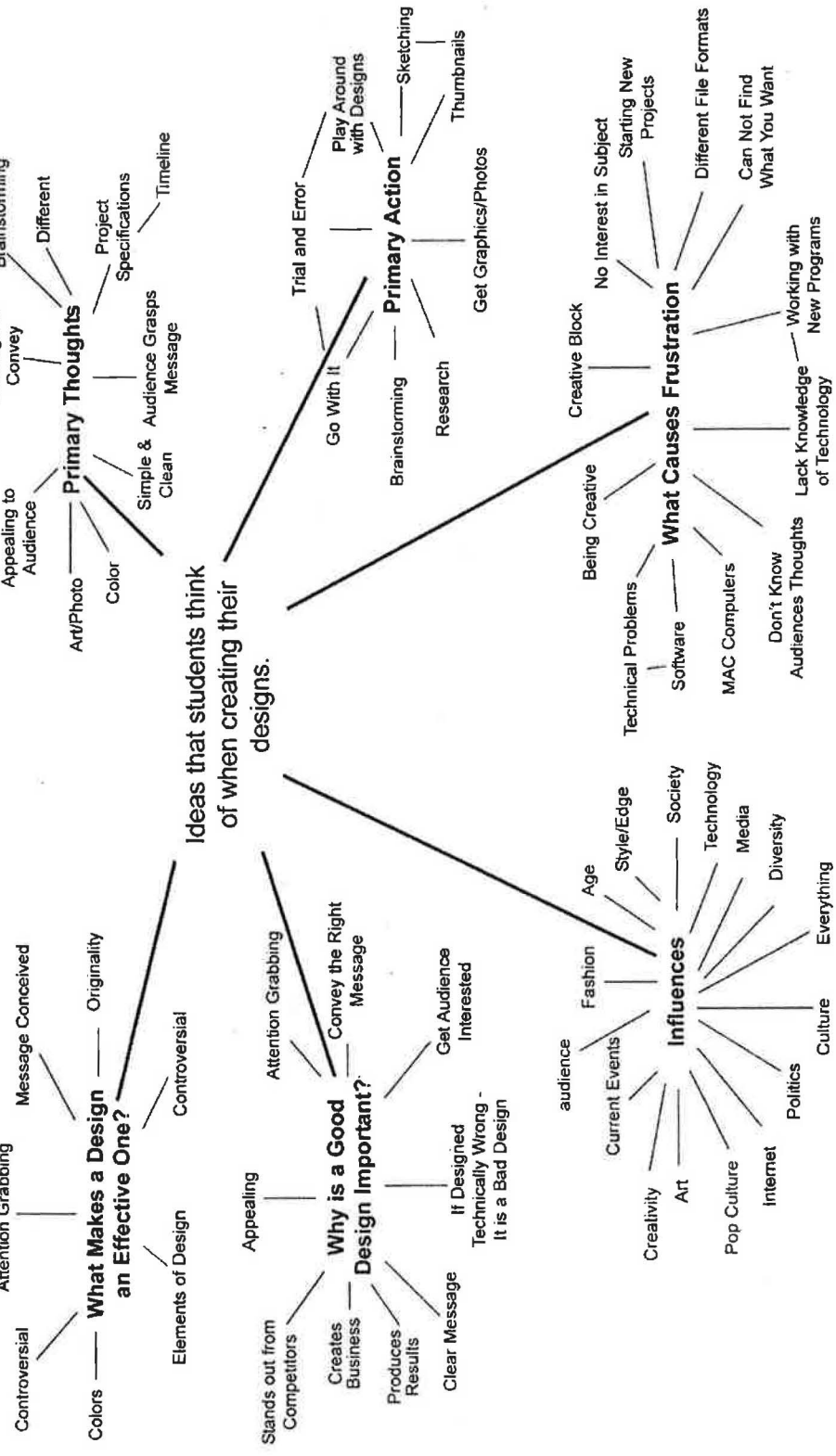
Appendix E
How students learn design



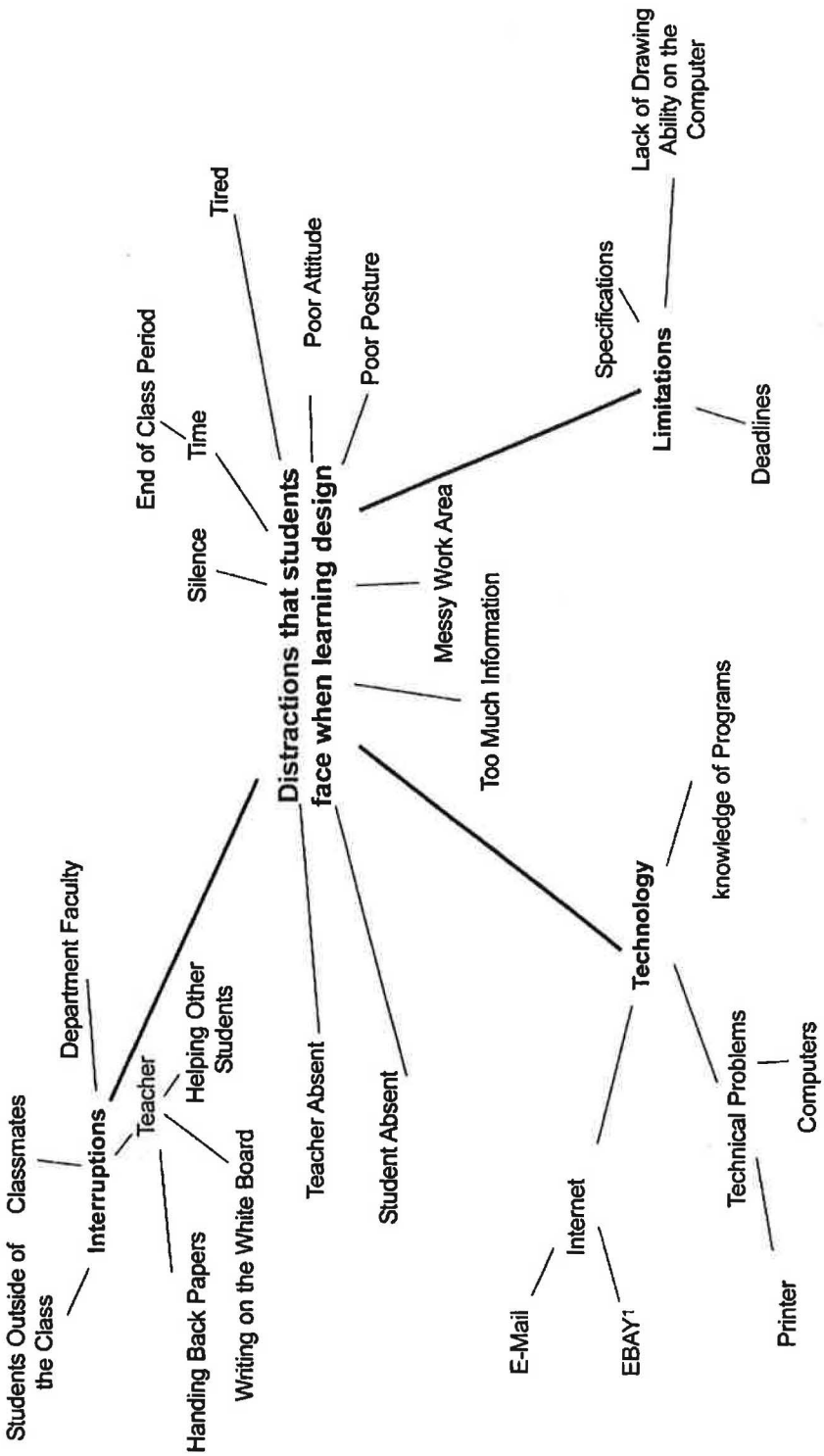
Appendix F
Factors that affect student learning

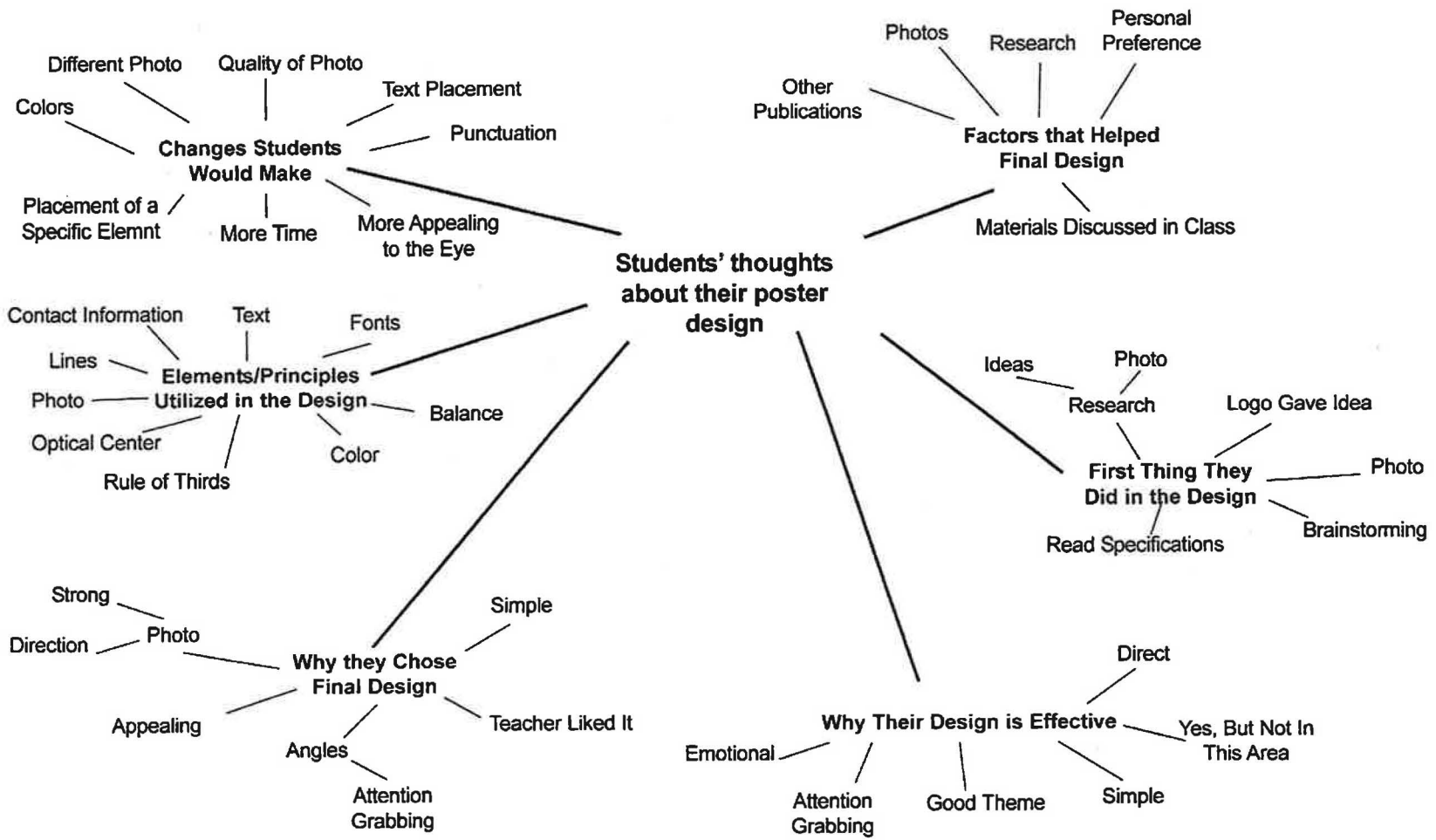


Appendix G
Creating a Design

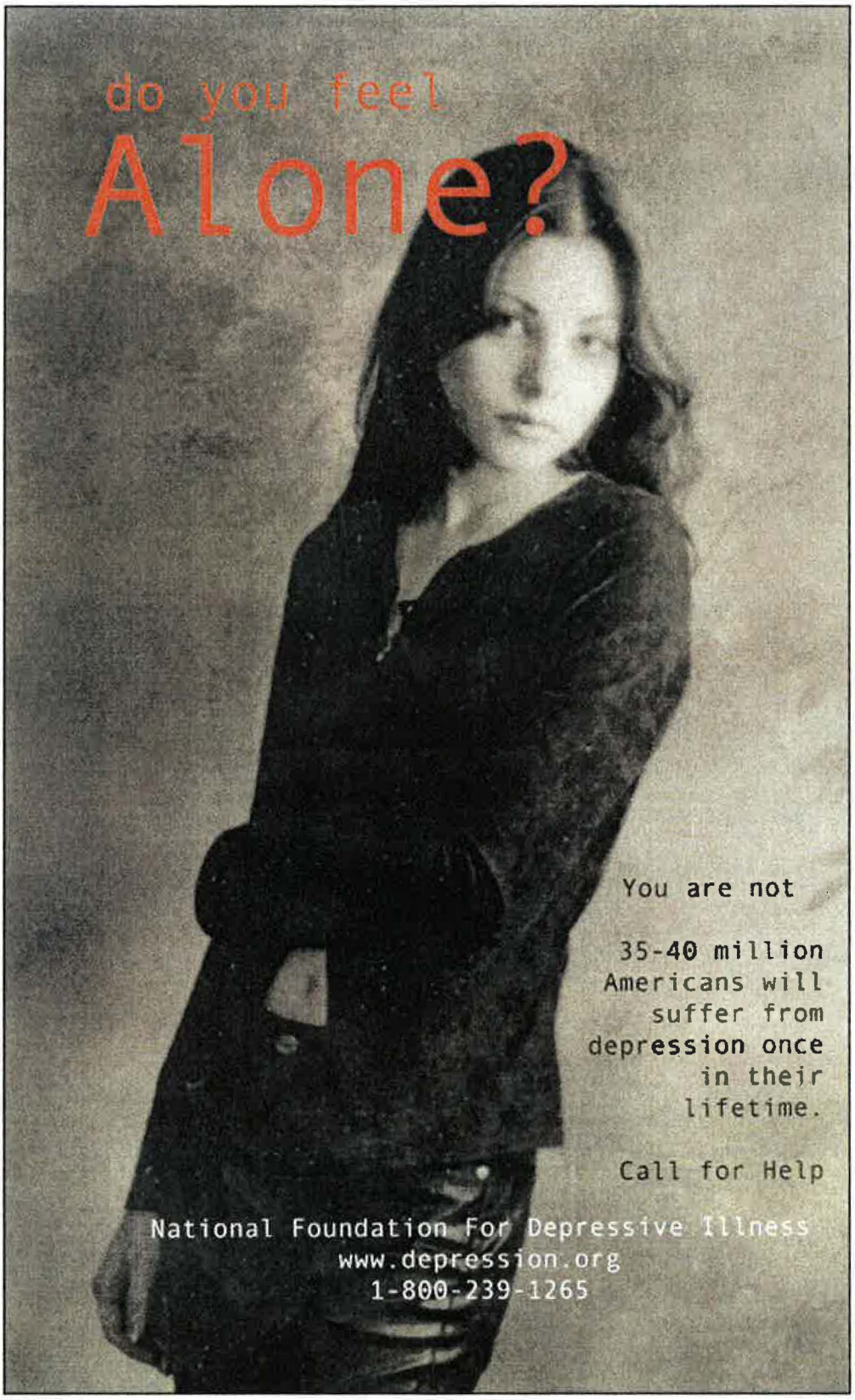


Appendix H
Distractions

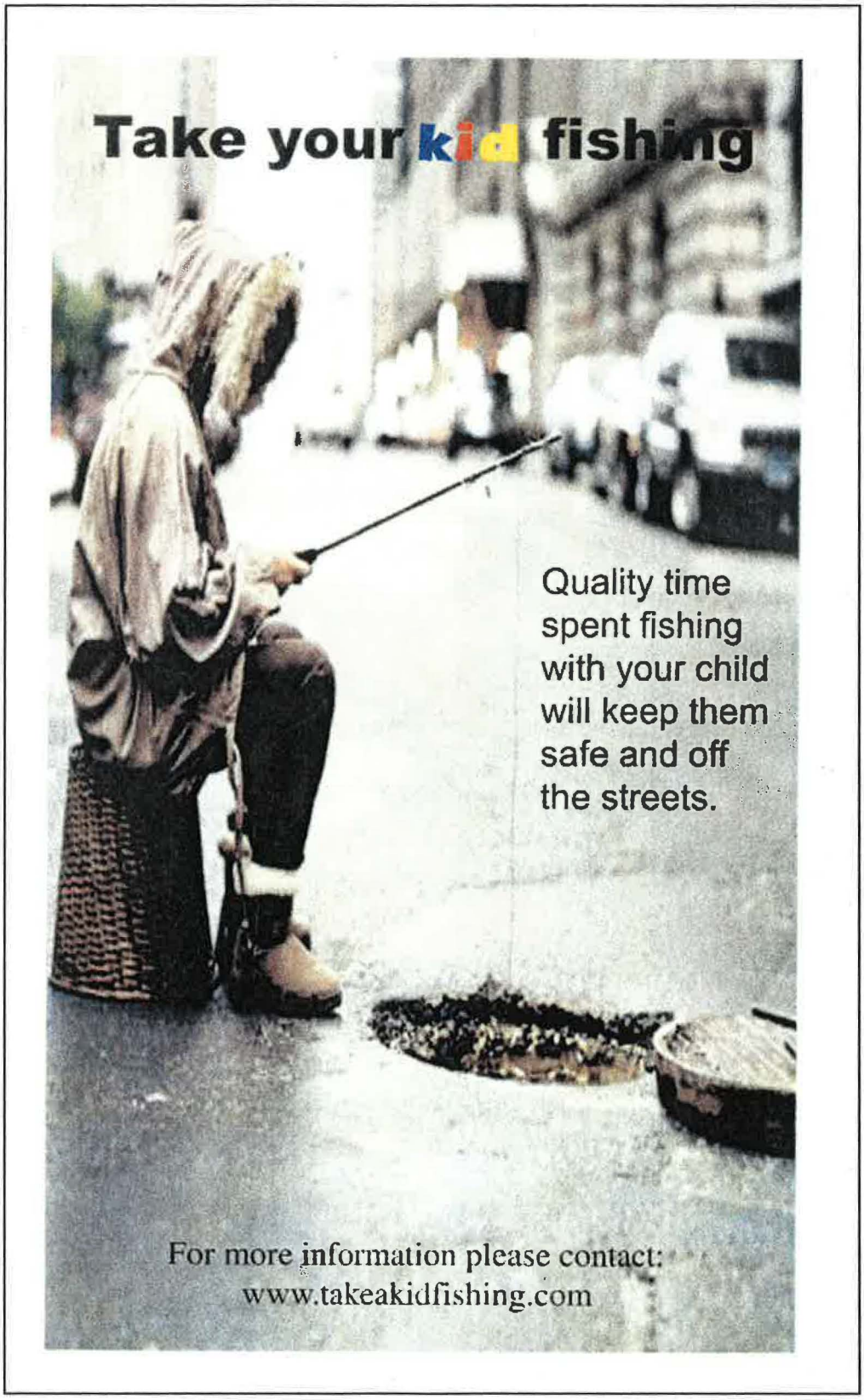



Students' thoughts about their poster design
Changes Students Would Make
Different Photo
Quality of Photo
Text Placement
Colors
Punctuation
Placement of a Specific Elemnt
More Time
More Appealing to the Eye
Factors that Helped Final Design
Photos
Research
Personal Preference
Other Publications
Materials Discussed in Class
Elements/Principles Utilized in the Design
Contact Information
Text
Fonts
Lines
Photo
Balance
Optical Center
Color
Rule of Thirds
First Thing They Did in the Design
Ideas
Photo
Research
Logo Gave Idea
Photo
Brainstorming
Read Specifications
Why they Chose Final Design
Strong
Simple
Direction
Photo
Appealing
Teacher Liked It
Angles
Attention Grabbing
Why Their Design is Effective
Direct
Yes, But Not In This Area
Emotional
Attention Grabbing
Good Theme
Simple

APPENDEX J
Poster Design 1

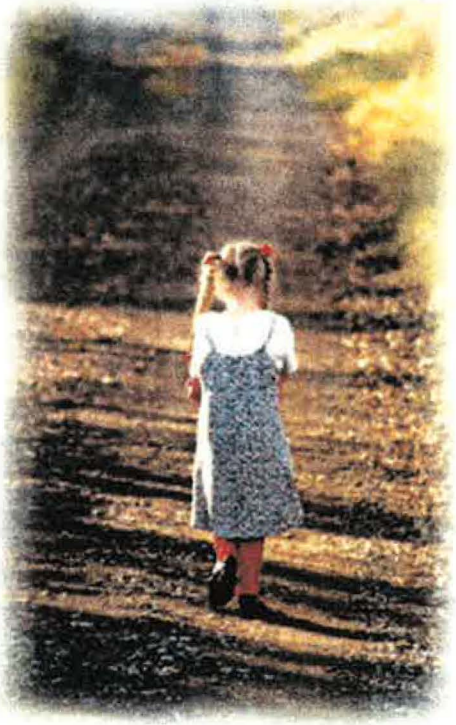


APPENDEX K
Poster Design 2



APPENDEX L
Poster Design 3

Adopt a child



There are no unwanted children, just unfound families. No child should be left without a family.

The National Adoption Center has found adoptive families for more than 19,000 U.S. children.

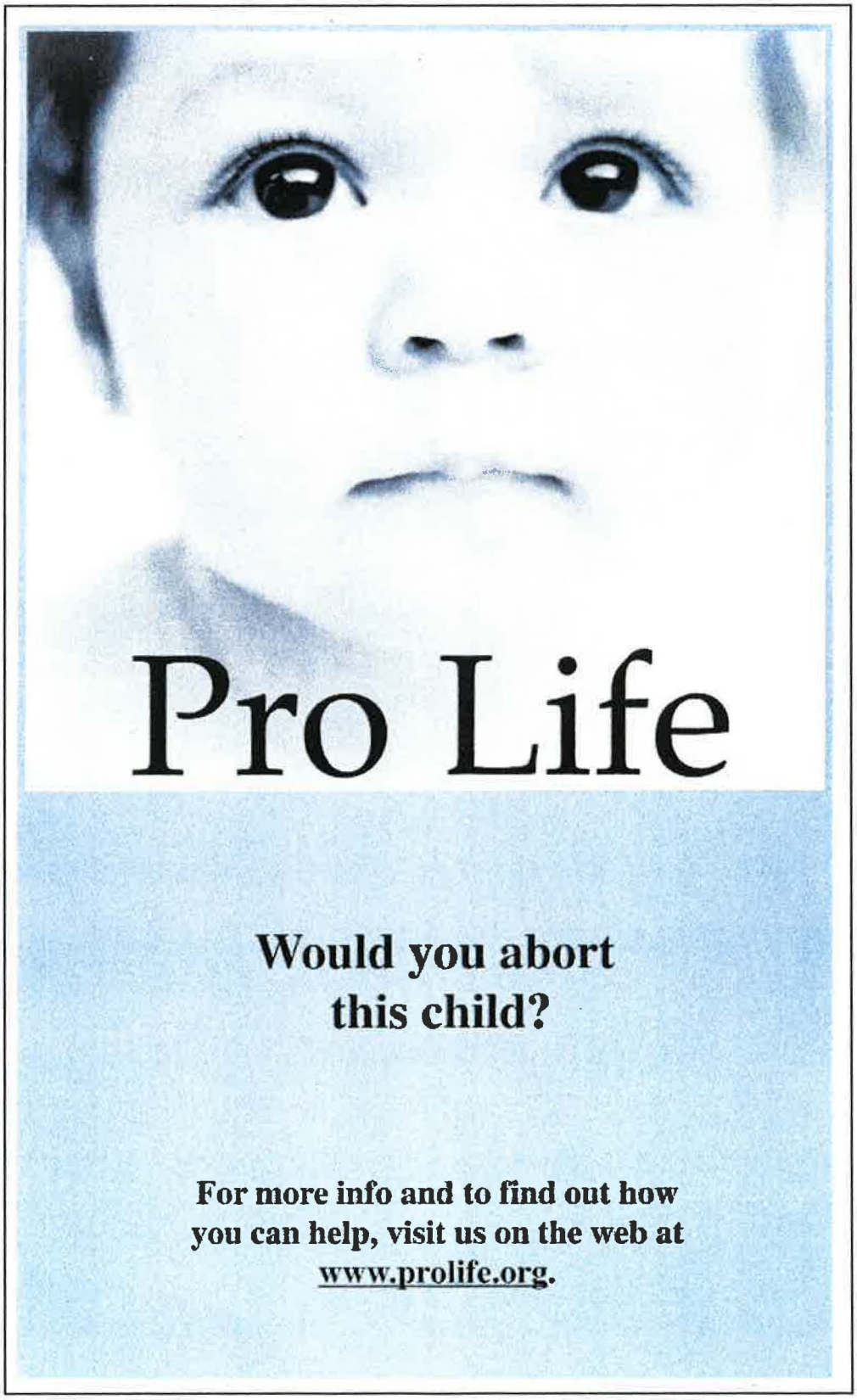
If you are considering adoption please contact the National Adoption Center

www.adopt.org

nac@nationaladoptioncenter.org

1-800-TO-ADOPT

APPENDEX M
Poster Design 4



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