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Essential Learning Objectives For Graphic Designers, Post Secondary

William Joshua Weaver
North Carolina Agricultural and Technical State University

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Essential Learning Objectives for
Graphic Designers, Post Secondary

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North Carolina A&T State University

A thesis submitted to the graduate faculty
in partial fulfillment of the requirements for the degree of

MASTER OF SCIENCE

Department: Technology Management

Major: Graphic Communication Systems and Technological Studies

Major Professor: Dr. Brenda S. Faison

Greensboro, North Carolina

2012

School of Graduate Studies
North Carolina Agricultural and Technical State University

This is to certify that the Master's Thesis of

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Greensboro, North Carolina
2012

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2012

Dedication

To all present and future graphic designers, may your computers never crash, your clients never complain, and inspirations never leave you.

Biographical Sketch

Joshua Weaver was born on March 13, 1985, in Greensboro, North Carolina. He received his Bachelor of Science degree in Graphic Arts and Imaging Technology from Appalachian State University in 2007. He is a Master's degree candidate for Technology Management at North Carolina Agricultural & Technical State University.

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Abstract

Graphic designers today need to possess a wide variety of skill sets in order to adequately perform their duties. The skill sets include areas of study in Art, Design, Computer Technology, and Print Technology. My goal is to find what learning objectives in these areas and others are essential for a person to become a graphic designer. A need for this arose from an observation of a growing gap between Art and Technology with emphasis on academic setting to professional setting. The reasons for the gap are that the range of knowledge and skills needed by today's graphic designers has increased dramatically, with emphasis on Web technologies. I will conduct a Delphi Study of professionals to find out these objectives from their expert opinions. The results will help to give instructors insight on the basis of what a graphic design curriculum can incorporate and what skill sets are sought after in the professional world.

CHAPTER 1

Introduction

Nature of Problem

Graphic design has grown into a broad spectrum of knowledge and skill sets encompassing vast amounts of information. The importance of identifying the knowledge and skill sets has become a challenge in this field, because of the ever-growing technological advances and demand of employers. In an American Institute of Graphic Arts (AIGA) study (2007a), the Institute “recognized that we needed to better understand the emerging role of designers and to enter into a deeper discussion with educators and design leaders on how to prepare designers for future changes.” Identifying the knowledge that a graphic designer needs to know will, in turn, help educators develop curricula that will better address the needs of current employers of graphic designers.

Graphic design is a way for the modern designer to communicate a message to a wide audience. Graphic design can be defined as a concern in the visual arts for shape, line, two-dimensional images, and typography (Stokstad, 2002). Graphic design can be referred to as the process by which the message is communicated or the product that is generated. The common practices in graphic design are identity and branding, websites, publications, advertisements, packaging, and motion graphics. These practices within graphic design all have skill sets that are associated with art, design, and technology. An individual must acquire skills and knowledge in these areas while in a post-secondary study to become an effective and proficient graphic designer. AIGA states in an article about the “Designers of 2015” AIGA study (2007a):

The communications design profession and practice have evolved dramatically over the past 20 years. During that time, we have seen the most successful practitioners progress

from being “makers of things,” trained within the dimensions of finite outcomes, toward becoming conceivers of strategies, communicating complex messages clearly and considering the many ways in which those messages are received by audiences over time. The designer of today is collaborative and multidisciplinary, and must become even more so in the years ahead.

Brief History of Graphic Design

The origins of graphic design date back to even before the practice existed, to the development of movable type in the Fifteenth Century. While the invention of movable type was made by Pi Sheng in 1040 AD, the invention of the process of printing and publishing books with the method of combining the printing press movable type, oil based inks, and cast metal type is most attributed to Johann Gutenberg (Meggs & Purvis, 2006). This new technology made possible the mass production of printed material on a never before seen scale and replaced techniques that had come before it, such as block printing and hand copying (Eskilson, p. 14, 2007). The practice of “graphic design” was left to the printer for approximately 380 years, until the term graphic design was actually established in the 1920’s, when a push for a more aesthetically pleasing literature was wanted. Although the profession of graphic design is difficult to place a time stamp on, the general consensus, according to Eskilson (2007), of the advent of graphic design is when the task of designing printed material was separated from the task of printing it (p. 29). This early history of graphic design shows the start of the paradox into which the profession was placed. While technological advances created the profession, the separation of tasks (design and print) was being established. So, as the designer separates himself/herself from the production, the knowledge and connection between creation and production of that design is separated.

From 1920 to the present, styles in graphic design have mapped the way in which the field of graphic design has taken. Styles ranging from Art Nouveau, De Stijl, Bauhaus, Swiss, Postmodernism, Grunge, and Technology. Each style brought forth by an artist or group of artists, who felt the field was lacking in aesthetic choices and wanted to broaden the field. While the advantages of broadening the field far outweigh the disadvantages, the knowledge of the graphic designer must also broaden. The knowledge expansion into different styles requires the question of finding the importance of looking at past styles and building upon them and in what context that importance is placed in the overall knowledge of the graphic designer.

Through the history of graphic design, technology has been a partner of the designer ranging from ink and paint applied by hand with pen and brush, to today's ink and paint applied by machine. Steady developments in technology have been at the forefront of a graphic designers' success through 2D computer programs such as Adobe Creative Suite (Photoshop, Illustrator, InDesign, Dreamweaver, Flash), to 3D software such as 3D Studio Max, Maya, and AutoCAD. Also developments in printing press technology such as Offset Lithography, Flexography, Digital printing, computer interfaces such as Mac and Windows, mobile devices such as smart phones, laptops, tablets, and easier accessibility to these items through the Internet and Wi-fi areas has led to the broadening and success of the graphic designer. As technology changes, so too must the knowledge of the graphic designer. Both must keep up with current trends, including knowledge in current practices in Web technologies and printing technologies (Perkins, 2010).

Rationale

Since the field of graphic design has become so broad with the emergence of mobile devices and the steady increase in Internet usage, the emphasis on the technology has become

overwhelmingly apparent for the graphic designer. “American artists have embraced the Internet as a creative and inspiration-enhancing workspace where they can communicate, collaborate, and promote their work. They are considerably more wired than the rest of the American population” (Madden, 2004). The graphic design field has become so broad, with a consensus in job description of skills needed being: artistic ability, extensive computer knowledge, Mac and Windows knowledge, print production knowledge, online media knowledge, different Internet coding languages (HTML, CSS, MySQL, PERL, etc.), teamwork and problem solving skills. The need for an integration of traditional Art and Design knowledge and the latest technological advances is greater in post-secondary education, now that business professionals are facing a challenge in finding qualified employees. The overwhelming amount of knowledge needed by job descriptions posted by these businesses, has caused more graphic designers to become niche artists, which means they only focus in one area of graphic design. They chose to be specialists as good illustrators, good animators, good website designers, good programmers, or they are proficient in a single design program out of numerous design programs. There are also graphic designers that have extensive computer knowledge, but who are lacking in design and art knowledge, and vice versa. This limits the capabilities of a designer and also limits a business, because excelling in one area of graphic design would require a business to hire multiple people rather than an individual who can fill the necessary roles. “More than half (53 percent) of business leaders say their companies face a very or fairly major challenge in recruiting non-managerial employees with the skills, training, and education that their companies need, despite an unemployment rate close to 10 percent and millions of Americans seeking jobs at the time of the survey” (Bridgeland, Milano, & Rosenblum, 2011). The study carried out by Bridgeland, Milano, and Rosenblum, shows a gap between America’s higher education and the skills

required by businesses. Graphic designers today need to possess a wide variety of skill sets in order to adequately perform their duties. The skill sets include areas of study in Art, Design, Computer Technology, and Print Technology.

A difficult task of integrating Art, Design, Computer Technology, and Print Technology has been posed to post-secondary education, with a need to define the importance of skill sets in each of these areas.

Purpose of Study

This study is a direct result of several need statements and proposals made by peers as well as articles in the field of graphic design. The need arose from an observation of a growing gap between Art and Technology with emphasis on academic setting to professional setting. The reasons for the gap are that the range of knowledge and skills needed by today's graphic designers has increased dramatically, with emphasis on Web technologies. The purpose of this study is to identify what learning objectives or skill sets are essential for a person to become a successful graphic designer now and in the future.

Research Question

This study addressed one major research question.

1. What do graphic designers need to know and be able to do in order to succeed in the graphic design field now and in the future?

Assumption

The following assumption was made about this study and the circumstances surrounding it.

1. Each expert answered the modified Delphi instruments truthfully.

Limitation

The study was conducted under the following limitation.

1. The sample size and location of qualified experts is based on a sample of convenience. The researcher attempted to identify and contact enough experts to make an adequate modified Delphi study.

Delimitations

1. The study did not discuss curriculum with regards to budget, resources, and personnel.
2. The participants in this study were delimited to professional graphic designers.
3. The study was delimited to three rounds of a modified Delphi instrument in order to encourage added variables and comments and to achieve agreement.
4. The sample surveyed is limited to the number thirty, but this number is adequate for a modified Delphi study given that all participants were qualified as experts.

Defined Terms

Typography – The setting and designing of text (Johansson, Lundberg, & Ryberg, p.452, 2007).

Art Nouveau –A decorative design style with the characteristic of organic plant-like line that is free from root or gravity and fluid in nature (Meggs & Purvis, p.194, 2006).

De Stijl – A design movement that took place in the Netherlands in 1917, which sought universal laws of equilibrium and harmony for art (Meggs & Purvis, p.299, 2006).

Bauhaus – A design style and school which sought a new unity of art and technology to solve visual and practical problems of industrialism (Meggs & Purvis, p.315, 2006).

Postmodernism- A movement in graphic design characterized by several different styles from approximately 1970 to the present (Meggs & Purvis, p. 266-267, 2006).

Photoshop – The most common image-processing program for professional use, from Adobe (Johansson et al., p. 439, 2007).

Illustrator – Vector-based illustration program from Adobe (Johansson et al., p. 431, 2007).

InDesign – Well established layout program from Adobe (Johansson et al., p. 431, 2007).

Dreamweaver – is the industry-leading Web authoring and editing software (Adobe, 2012).

Flash – is the industry-leading authoring environment for producing expressive interactive content (Adobe, 2012).

3D Studio Max – is integrated 3D software for modeling, animation, rendering, and compositing (Autodesk, 2012).

AutoDesk Maya – Animation software with end-to-end creative workflow for modeling, animation, rendering, and compositing (Autodesk, 2012).

AutoCAD – A 3D modeling and architectural program (Autodesk, 2012).

Offset Lithography – Printing technique where the image carrier transfers (offsets) the print ink onto a rubber cylinder, which then transfers the ink/print image to paper (Johansson et al., p. 437, 2007).

Flexography – A direct printing technique. The print areas are elevated compared to the non-print areas usually the image carrier is rubber or plastic (Johansson et al., p. 426, 2007).

Digital printing – Printing press that prints information directly from a computer without printing plates (Johansson et al., p. 422, 2007).

Hypertext Markup Language (HTML) – Markup language used for the appearance and content of Web pages (Johansson et al., p. 429, 2007).

Cascading Style Sheets (CSS) – A presentation language used with HTML for Web pages (Vodnik, p. 26, 2011).

MySQL – An open source relational database management system (Sheldon & Moes, 2005).

PERL – Practical Extraction and Report Language is a scripting language commonly used for Web servers (Sheldon & Moes, 2005).

Forestry Stewardship Council – is an independent, non-governmental, not for profit organization established to promote the responsible management of the world's forests (Wilson, 2000).

Renaissance – A period of time which began in the fourteenth and fifteenth centuries in Italy, when classical literature of ancient Greece and Rome was revived. Also a period of time of great art and architecture revival (Meggs & Purvis, p. 94, 2006).

Rule of Thirds – A photography technique where the field of view is separated into a 3x3 grid and the main object or focus lies on the 4 points of intersection of the grid (Elam, 2004).

Cubism – A movement in design characterized by moving away from natural form where figures are abstracted into geometric shapes and planes and classical norms are broken (Meggs & Purvis, p.248, 2006).

Futurism – A movement in design characterized by testing ideas and forms against new realities of scientific and industrial society. The movement is characterized by bold forms and colors, often using sound as an influence in placement of shapes and type (Meggs & Purvis, p. 251, 2006).

Dada – A movement in design that reacted against World War I, claiming to be anti-art and had a strong negative and destructive element. The movement concerned itself with shock, protest, and nonsense (Meggs & Purvis, p. 256, 2006).

Surrealism – A movement in design that sought to be more real than real life. This movement explored the world of intuition, dreams, and the unconscious (Meggs & Purvis, p. 262, 2006).

Expressionism – A movement in design characterized by depicting subjective emotions and personal responses to subjects and events (Meggs & Purvis, p. 263, 2006).

Serif – Structural details on the ends of letters found in Roman fonts (Johansson et al., p. 446, 2007).

Sans Serif – A typeface family without serifs (Johansson et al., p. 445, 2007).

Supergraphics - bold geometric shapes of bright color, giant Helvetica letterforms, and huge pictographs spanning walls, bending corners, and expanding from floor to wall to ceiling (Meggs & Purvis, p. 467, 2006).

Vernacular design – Artistic and technical expression broadly characteristic of a locale or historical period (Meggs & Purvis, p. 481, 2006).

Bitmap – The digital information, which describes a digital image or page using ones and zeros (Johansson et al., p. 415, 2007).

Pixel – Abbreviated from Picture Element. The smallest visual component of a digital image or monitor (Johansson et al., p. 439, 2007).

Responsive design - A Web layout that can adapt to whatever device the viewer is using to access the site, desktop, laptop, tablet, or smart phone.

Extensible Hypertext Markup Language (XHTML) –an HTML system for tagging text files to achieve style formats on Web pages (Johansson et al., p. 429, 2007).

Point Size – Typographical term for line spacing, measured from base line to base line (Johansson et al., p. 440, 2007).

Leading – in Typography, is the distance between baselines of successive lines of type (Johansson et al., p. 432, 2007).

Tracking – Adjustment of character spacing, expanding and condensing in a text piece or line (Johansson et al., p. 451, 2007).

Kerning – Narrowing or widening the spacing between two letters (Johansson et al., p. 432, 2007).

Opentype – File type for fonts that can contain a very large number of typefaces compatible with Macs and PCs (Johansson et al., p. 437, 2007).

Truetype – File type for fonts not based on Postscript (Johansson et al., p. 450, 2007).

Postscript type 1 – The first version of the page description language Postscript. There are also level 2 and 3 (Johansson et al., p. 440, 2007).

Highlights – The light parts of an image.

Mid-tones – Tones in the images between the lightest and darkest (Johansson et al., p. 435, 2007).

Shadows/lowlights – the darkest parts of the images (Johansson et al., p. 434, 2007).

Compression – Recoding and sometimes reducing the information content of a file so that it takes up less memory (Johansson et al., p. 419, 2007).

Resolution – Describes the density of information in a digital image (Johansson et al., p. 444, 2007).

RAW format – Some digital cameras can store images in raw format. This means that all of the original information from the camera's image sensor is stored in the image file (Johansson et al., p. 443, 2007).

Lempel, Ziv, Welch (LZW) – Loseless compression method named after the researchers who developed it. LZW is usually used for TIFF formats (Johansson et al., p. 434, 2007).

ZIP - a file compression program (Johansson et al., p. 454, 2007).

Joint Photographic Experts Group (JPEG) – A compression method for images that entails some loss (Johansson et al., p. 432, 2007).

Dots per inch (dpi) – The number of exposure points per inch, indicates the print resolution of an image setter or printer (Johansson et al., p. 423, 2007).

Exposure – Illuminating paper, film, or a plate with light in order to transfer an image (Johansson et al., p. 425, 2007).

Color theory - the practical use of color mixing and the visual impacts of color combinations.

The Pantone Matching System (PMS) – based on combinations of nine different colors primarily used for spot colors (Johansson et al., p. 440, 2007).

Cyan, magenta, yellow and black (CMYK) – A subtractive color system used in four- color printing and four-color printers (Johansson et al., p. 4418, 2007).

Additive color mixing – When an individual is actually adding of RGB light in order to create new colors (Johansson et al., p. 71, 2007).

International Color Consortium (ICC) – a group of soft and hardware manufacturers in the graphics industry working to find a common color management standard (Johansson et al., p. 430, 2007).

CIELAB – Commission Internationale d’Eclairage, the international commission created color system based on a standard observer (Johansson et al., p.418, 2007).

ICC profile – A standard for describing the color characteristics of scanners, monitors, printers, proofs and prints (Johansson et al., p.413, 2007).

Vector – Images based on outlines composed of short, straight lines (Johansson et al., p.452, 2007).

Portable Document Format (PDF) – a file format created by Adobe from a program Acrobat Distiller (Johansson et al., p.439, 2007).

Encapsulated PostScript (EPS) – A file format for digital images and illustrations that manages both object and pixel based images (Johansson et al., p.425, 2007).

Adobe Illustrator (AI) – Illustration program from Adobe (Johansson et al., p.430, 2007).

Photoshop format (PSD) – Image file format saved in Adobe Photoshop (Johansson et al., p.442, 2007).

Tagged Image File Format (TIFF) – A common image format (Johansson et al., p.450, 2007).

Graphic Interchange Format (GIF) – A file format in index mode mainly used for the Web that contains up to 256 colors (Johansson et al., p.428, 2007).

Portable Network Graphics (PNG) – Image format, which extends the functions of the GIF format (Johansson et al., p.440, 2007).

Film production – After exposure, the image on a film is developed and fixed using chemicals (Johansson et al., p.426, 2007).

Interquartile range – a measure of variability, based on dividing a data set into quartiles, and finding the middle fifty percent by subtracting quartile one from quartile three, finding the middle fifty percent (Rubin, 2010).

CHAPTER 2

Review of Related Literature

Introduction

The broadening of the field of graphic design has been both a blessing and a curse for the graphic designer. While advances in technology have made many aspects of the field of graphic design possible, new knowledge and skill sets have also accompanied these advances. The graphic designer today must integrate knowledge from a variety of subjects ranging from art, computer technology, printing press technology, Web technology, problem solving, humanities, and communication. AIGA stated in its study of the “Designer of 2015” (2007a):

As the contexts in which communication occurs become more diverse, designers need to experience meta-disciplinary study as well as training deeply in specific disciplines. They must understand the social sciences and humanities in order to understand the content they are asked to communicate and they must understand how to work collaboratively with other knowledge and practice specialists.

This idea illustrates the vastness of knowledge that the field of graphic design encompasses. Also, a question that arises is, what is the level of importance of these subjects to the success of the graphic designer? The theories to solve the question continue to evolve in an ever-changing environment of graphic design.

State of the Profession

Discussing the current state of graphic design can be difficult given there are many aspects to this multi-disciplinary field. Since many graphic designers come from different foundations; it is important to take every perspective into consideration. Eskilson (2007) gives the perspective of how different styles progress through the years leading up to and beyond

postmodernism into a state of confusion. “The first generation of postmodernists was united by the thrill of breaking the rules of the International Style, but this iconoclasm played itself out in the 1990’s. Are there really any rules left to break?” (p. 421). Eskilson (2007) asks the question, “if postmodernism has ended, then what has replaced it” (p. 241)? He answers his own question by stating that some have found purpose as political activists and there is a rise in more designers producing work that speaks to society and cultural issues such as global warming and the HIV/AIDS epidemic. There are also many efforts by corporations to have more global design campaigns, that is, campaigns that can be used in more than one social, economic, cultural, or ethnic region. This is a separation from the thought of design being a format made usually for a specific audience or demographic in mind.

Neylan (2011) discusses in a webinar series with Girling, *Artefact*; and Toma, *Adobe*, the state of graphic design in the perspective of bridging the gap between digital and analog design practice. She summarizes the webinar with seven terms, complication, democratization, commodification + devaluation, education, exploration, articulation, inspiration. Complication speaks to the task designers face today when the products or the communication, which they are designing, is being viewed in a variety of mediums that are known or unknown to the designer. Designers have to be able to design once for a variety of devices (books, periodicals, mobile phones, laptops, desktops, tablets, and various screen sizes). Democratization talks about the technological innovations becoming so rapid and easily accessible, that anyone can now be a designer. Education and exploration refers to a need for design education to seek new technologies and processes to expand one’s skills over a broad range of subjects and not a specialized set of knowledge as once thought. Articulation speaks to having the designer be able to expand his/her vocabulary and communicate over a variety of subjects. And lastly, inspiration

talks about creating a confluence of people and resources to continually inspire and be inspired by designers and a variety of other disciplines. Neylan (2011) summarizes this webinar by stating:

Technology is radically changing the way we design and designers need to keep up with these changes. It is and we do. But design as a recognized field is a relatively young discipline, and with the exception of typography, spawned in large part by the industrial age. So historically speaking, has there ever been a time when designers have not had to respond quickly and nimbly to change? Has there ever been a time when design stood still? Alexey Brodovitch and Bradbury Thompson had to keep up with rapidly evolving printing and color reproductions technologies in order to produce their revolutionary magazine layouts. Charles and Ray Eames were constantly exploring the boundaries of materials science, evidenced in their iconic furniture designs and equipment for the U.S. military. Being a designer means being a technologist.

The graphic design profession from the perspective of the printer is one of keeping abreast of the new processes and technology in print production. Graphic designers need to concern themselves with developments in “green” practices and the advancement of digital processes. “Green” practices are efforts made by printers to employ more environmentally sustainable processes through their industry. This is done through recycled papers, Forestry Stewardship Council (FSC) paper, waterless printing, soy based inks, and utility management processes. In a study conducted by WhatTheyThink’s Economics and Research Center, “the top green practice that U.S. commercial printers said they had implemented was to “promote recycled papers as better than ‘typical’ papers,” which had been cited by 30 percent of all respondents” (Busch, 2009). The study also stated that, “the percentage of companies that gain

special green certifications from independent organizations has risen from 15 percent to 22 percent” (Busch, 2009). The graphic designer, keeping these things in mind, is part of the chain in informing clients on these issues as many graphic designers are in charge of the specifications of printed pieces. These specifications include, size, paper, and process used to print the material.

Digital processes are on the rise in the printing industry. At 2010’s International Printing Machinery and Allied Trades Exhibition (IPEX), the floor plan was 26% conventional printing and 38% digital (Saunders, 2011). Ink-jet processes and quality are advancing to become a front-runner in certain types of printing, with sheet-fed and web-fed presses. With the advancement of these processes, the graphic designer now can keep jobs “in-house,” rather than outsourcing them to printers who specialize in prepress graphics. This technology helps graphic designers proof their work, and graphic designers are able to mockup printed pieces in specification.

Skill Sets and Knowledge

Knowledge used in graphic design is based in the history of graphic design and in the fundamentals, principles, and elements involved in graphic design. Skill sets included in the field of graphic design are typography, photography, layout, drawing, and craftsmanship. Skill sets of a technical nature involved in graphic design include computer knowledge, various computer program skills, print production, and press technology. There are also skill sets in communication and marketing.

History of Graphic Design

Graphic design history provides knowledge of past designers and their works to current graphic designers. By studying previous works of art and design, graphic designers build a

“library” of knowledge from which to pull to produce their work. Past great artists have generated their work by studying previous masters’ works. Rembrandt studied Leonardo Da Vinci’s Last Supper for years before he created his famous Last Supper painting (Stokstad, p. 34, 2002). This practice is the same for a graphic designer. He or she will study a previous person’s work or various works from different artists to create his or her own work. Since the idea of graphic design is to communicate a message, the designer must think of things associated with that message, gather them together and put them on display in a clear concise way, so that the viewer can interpret and understand the message the designer wishes to convey. A more focused way of learning that this practice associates closely with graphic design is learning the history of graphic design. Education in this field can give the graphic designer knowledge in the different processes and styles within graphic design throughout the years. This knowledge will be important to graphic designers as they develop a professional career by studying how other graphic designers, past and present, effectively conveyed their messages within the work.

With the invention of movable type by Pi Sheng in 1040 A.D., the field of graphic design slowly started to take shape. The process of movable type and paper moved slowly into Europe around the time of the Renaissance. This provided key elements in book production, which was growing in demand during the time. The process of printing was slowly improved upon during the Renaissance with illustrations from woodblocks and copper plate engraving. Different elements and principles of design started to become more apparent when more and more printed books became available. Typesetting and illustrations were usually separated tasks performed by the printer and illustrator respectively. The use of different typesets and techniques of engraving and illustrating increased during this time. Printing spread to major commerce and economic areas in Europe and made its way to North America in 1639 (Meggs & Purvis, p. 115, 2006).

Graphic design experienced many changes, as did many fields, during the Industrial Revolution (18th and 19th Century). With the ever-growing demand for graphic communication, technology made increased production possible by driving down unit costs. During the 19th Century, the specialization of the factory system was introduced to graphic design. Earlier the tasks of the printer involved typesetting, page layout, and actual production of the book or broadsheet. This was now no more. Tasks were split between designer and production. This provided many changes in the field of graphic design. Ranges of typography greatly increased. Photographic printing and color lithography expanded from the wealthy to everyone in society. It is an interesting fact to note the separation of tasks between designer and printer. Technology was a reason for the split in tasks, and today technology is a reason for the tasks or knowledge coming back together.

With the development of lithography in 1796 by Senefelder, printed pieces were able to be produced cheaper and did not rely on raised or incised plates to produce an image. Lithography works on the principle that oil and water do not mix. The Boston School of Chromolithography improved upon the lithographic process. In 1846, Richard M. Hoe invented the rotary lithographic press, which could print six times faster than the normal lithographic press. This process was used to create much more vibrant color images than ever before and created a whole new practice and capabilities in the field of graphic design. With the process of printing becoming cheaper, a rise in advertising design occurred. One of the most famous magazines came from this era in graphic design with Harper's Magazine and the other variations stemming from the Harper brothers (Meggs & Purvis, 2006).

As technology has influenced the way in which graphic design is created and seen throughout its history, so too have the different styles within graphic design history. The Arts

and Crafts movement which occurred approximately from 1860 to 1910, showed a return to fine craftsmanship with a focus in book design. The design during this time used extremely ornate design resembling filigree to provide design unity. Emery Walker, founder of the Doves Press, “considered book design similar to architecture, for only careful planning of every aspect—paper, ink, type, spacing, margins, illustration, and ornament—could result in design unity” (Meggs & Purvis, p. 172, 2006). William Morris, friend and inspiration of Walker, formed the Kelmscott Press in 1891. Morris developed a design attitude that called for “workmanship, truth in materials, making the utilitarian beautiful, and fitness of design to function” (Meggs & Purvis, p. 173, 2006) were adopted by future generations who sought to unify art and industry.

Art Nouveau was a style that came about in the late 19th and early 20th Century characterized by organic, flowing, sinuous lines usually from flowers or leaves. Art Nouveau presented the new design principle of unifying decoration, structure, and intended function. The most familiar works in Art Nouveau come from French designers Chéret, Grasset, Toulouse-Lautrec, and Mucha. Art Nouveau led into the Twentieth Century and evolved with the help of Frank Lloyd Wright and the Glasgow School. Wright embraced a more organic philosophy of design that the part is to the whole just as, the whole is to the part. Wright used a combination of curvilinear and rectilinear spatial organization in his architecture and graphic design. The Glasgow School was a group of four individuals that brought together an architectural structure with fantasy-like images combining organic and rectilinear shape and design.

Peter Brehrens was a major figure in graphic design during the first decade of the Twentieth Century. He brought about typographic reform, adopting a more sans-serif style and using a grid system to determine space and layout of a design, which is still used today. His style was a contradiction to the ornate and flowing type that was dominating the time period.

The structure and design of Behrens typefaces were hugely successful in book and job-printing typography. Behrens is most noted for his work as the artistic advisor at Allgemeine Elektrizitäts-Gesellschaft (AEG), where he created a style of bringing together neoclassicism and commonsense objectivity. This style is associated with classic forms of harmony and proportion from Greece and Rome with pragmatic emphasis on technology, manufacturing processes, and function, where artistic interpretation was subordinate to purpose (Meggs & Purvis, p. 238, 2006). Behrens apprentices would later go on to develop movements of their own, most notable the Bauhaus movement.

With the emergence of modern art during this time, many new styles were used in graphic design, Cubism, Futurism, Dada, Surrealism, and Expressionism. The attitude in Cubism pushed designers to look at space relationships differently and experiment with geometric shapes in a new way. Futurism was led by an Italian poet, Filippo Marinetti, in 1909. His poems were depicted using just a few colors and multiple typefaces arranged in space in a chaotic manner to give emphasis where it was needed. He rejected the use of uniform and grid like systems and developed a nonlinear dynamic composition approach. This shows the attitude in design of knowing when and when not to break the “rules” of design, which is often a common occurrence in this field. Dada was a movement that rebelled completely against all tradition, to gain complete freedom artistically. Dada influenced graphic design by taking typography out of its traditional usage to the concept of using it as visual elements and shapes, not just language (Meggs & Purvis, p. 262, 2006). This usage of typography would be the catalyst in many logo designs where letters are used both for their shape and representation of a business or product name. Surrealism’s biggest contribution to design was giving the designer the ability to use his or her intuition and to visualize his or her imagination and express that on

substrate. Expressionism gave designers a way to express parts of the human condition and the environment. Color theory and form techniques also advanced and would later become a foundation in the Bauhaus movement (Meggs & Purvis, p. 266, 2006).

With the onset of World War I, the field of poster design hit a high point with emphasis on support and activism on both sides. During this time period, the public was introduced to iconic figures for armed forces recruitment: James Montgomery Flagg's poster design of Uncle Sam saying, "I Want YOU" for U.S. Army recruitment and Great Britain's counterpart by Alfred Leete calling for Britons to join the country's army. Germany had its own posters that depicted strong visual elements implying a master race. These three poster designs are important in understanding the use of propaganda in design and the important role the graphic designer has to the audience. Also during this time designers were influenced by the modern movements and used different techniques such as collaging and cubism in their poster designs (Eskilson, 2007). Due to Germany's excellent print technology and art training institutes, graphic design was pushed forward greatly, and new avenues of design sprang up rapidly causing these many movements.

During the summer of 1917, a movement known as De Stijl was taking place in the Netherlands. De Stijl, like many other movements, sought to find universal laws of equilibrium and harmony (Meggs & Purvis, p. 299, 2006). Designers during this time used flat color of geometric shapes, usually squares or rectangles, divided by solid black lines in order to organize space. Also during this time, designers applied these concepts to typography by removing all curved lines and used rectangular blocks to form letters. In addition, mainly sans serif fonts type was used. This movement was a charge forward in asymmetrical balance where a grid was

implied. Red was often used to counter black in works during this time and also symbolized revolution.

Bauhaus was a school in Germany from 1919 to 1933 in which advanced art and design movements were explored and applied. The goal of Walter Gropius, founder of the Bauhaus School, was a new unity of art and technology to solve visual and practical problems of industrialism. The Bauhaus School sought to solve problems that continue today in graphic design and in academia, a unity of art and technology. The school workshops were organized as master, journeyman, apprentice, and taught by an artist and craftsman. Bauhaus developed many techniques including a new unification of photography and typography. These techniques were used in poster design to enlarge, distort, highly expose photos, and also to create contrast with bold typography. In 1926, the Bauhaus magazine began publication (Meggs & Purvis, p. 315, 2006). These magazines were a vehicle for ideas and techniques taught at the school to be revealed to the public. During this time, Herbert Bayer, a professor of typography at the Bauhaus School, designed a universal sans serif typeface that was clear and simple. He omitted capital letter case and experimented with text justification and letter spacing (Meggs & Purvis, p. 316, 2006). Bars, points and rules of strong color were used to organize and create unity in Bayer's designs. These techniques are still important for designers to understand that images are not always needed to create emphasis or organization on the page. The Bauhaus school ended in 1933 due to the rise of the Nazi party and onset of war. In 1961, Bayer wrote a poem entitled "homage to Gropius:"

for the future / the bauhaus gave us assurance / in facing the perplexities / of work; / it
gave us the know-how to / work, / a foundation in the crafts, / an invaluable heritage of
timeless principles / as applied to the / creative process. / it expressed again that we are /

not to impose aesthetics/ on the things we use, to the structures we live in, / but that purpose and form must / be seen as one. / that direction emerges when one / considers / concrete demands, / special conditions, / inherent / character / of a given problem, / but never losing perspective / that one is, after all,/ an artist, / the bauhaus existed for a short / span of time / but the potentials, / inherent in its principles / have only begun to be realized, / its sources of design remain / forever full / of changing possibilities (Meggs & Purvis, p. 319, 2006).

This poem eloquently describes the graphic designers' purpose charging them with the task of problem solving as well as being aesthetically careful in their work.

Many of the developments concerning modern art and Bauhaus influence in graphic design were not accessible to the mainstream. Jan Tschichold applied techniques of the time to basic, everyday design problems and introduced these techniques to printers, typesetters, and designers on a much larger scale (Meggs & Purvis, p. 319, 2006). Tschichold's work deals with using typography to create asymmetry on a page. He emphasized the idea that a dynamic force should be present in the design and type arrangement and alignment should follow accordingly to that force. During this time, many new typefaces were introduced that today are most widely used, Gill Sans, Futura, Times New Roman, being a few. Also during this time a new way of creating a map using more of diagrammatic interpretation rather than geographically correct was created to simplify the use of a map. Photography was used more and more in design pieces often with experimentation in scale with regards to foreground and background images.

With the onset of World War II, many of the influential designers of Europe fled to the U.S. bringing with them the modern arts movements taking place in Europe. These new

techniques were seen on magazine covers, such as Harper's Bazaar, demonstrating use of sans serif typefaces and varied image cropping and structure. Bayer, being one of the most famous designers that moved from Europe, and his associates published the World Geo-Graphic Atlas in 1953. Bayer assembled massive amounts of information on resources, economics, climate, and sociology to develop a comprehensive way to design and visually communicate diagrams and most importantly geographic locations (Meggs & Purvis, 2006).

A significant movement in graphic design developed in the 1950's called the International Typographic Style. This movement was significant for two major reasons: the first being, the visual characteristics of the movement. The International Typographic Style was a unity of design using asymmetrical organization on a mathematically constructed grid. The style also used objective photography and copy that presented these two in a clear and factual manner, unlike the exaggerated visual aspects of propaganda and commercial advertising. The second reason this movement was so significant was the attitude developed by the founders of this style. They defined design as a socially useful and important activity. Personal expression and eccentricity was thrown out, for a more universal and scientific approach to design and problem solving. The goal was to visually communicate important information to different components of society (Meggs & Purvis, p.356, 2006). This attitude and movement was vastly important to regions in which multiple languages were spoken. This more systematic and universal design style could be used to communicate through language and cultural barriers.

During the International Typographic Style era many new typefaces were created that are in mainstream use today. Adrian Frutiger developed the Univers typeface; this typeface family was comprised of twenty-one sans-serif fonts. Univers 55 was the medium basic book type and the range extended to Univers 39, which was light and extra condensed, to Univers 83, which

was extended and extra bold (Meggs & Purvis, p. 361, 2006). The Helvetica typeface was developed in 1957 by the Haas type foundry (Craig, p. 85, 1999). The Helvetica typeface is one of the most recognizable and used typeface in the world today with many variations, one of which being Neue Helvetica developed in the 1980's. Hermann Zapf, a famous German typeface designer, developed three key fonts during this era, Palatino, Melior, and Optima.

Graphic designers during this time used these typefaces to achieve a universal design aesthetic, with clearly displayed fonts often times running vertical with distinct contrast to the background. Type and images were arranged according to a mathematical grid so information was clearly accessible to any viewer.

During this time, the U.S. was experiencing a new design movement led by the New York School of designers. Emphasis in design was placed on open expression, novelty of technique and originality of concept (Meggs & Purvis, p. 374, 2006). Paul Rand, one of if not the most influential American designers, was one of the pioneers of this style of combining personal expression and solving communication problems. Rand is most notable for his logo design, but also made contributions to magazine and editorial design. Another extremely influential designer during this time was Saul Bass. Saul Bass took the principles of the New York School to Los Angeles, where he created many memorable movie posters and images. Bass frequently used simple designs, mainly with a single dominant image to communicate his message to the audience (Meggs & Purvis, p. 379, 2006). During this time, magazines and other publications were established to fill the need of "well designed" American periodicals. Esquire and New York Magazine were developed to accompany Fortune, Vogue, and Harper's Bazaar. Two most notable magazines on the field of graphic design were established during this time,

Print and Communication Arts. These two magazines played a major role in defining the profession of graphic design and its standards even today (Meggs & Purvis, p. 388, 2006).

Saul Bass and Paul Rand played crucial roles in the major design movement of corporate identity. Corporate identity includes logo design, which became popular with businesses to easily communicate to the public who they are and be recognizable and distinguishable marks on the consumers' minds. Saul Bass designed logos for Continental Airlines, AT&T, Dixie, Girl Scouts of the USA, Geffen Records, Minolta, Rockwell International, United Airlines, United Way, US Postage, and Warner Communications to name a few. Paul Rand designed logos for IBM, UPS, Enron, Westinghouse, ABC, and Steve Jobs' NeXT. Chermayeff & Geismar Associates were a design firm that created logos for Chase Manhattan Bank, Mobil Oil, Time Warner, NBC, and Rockefeller Center (Meggs & Purvis, 2006).

One of the most influential poster designers appeared on the scene during this time, Milton Glaser. Glaser adapted to the creative field of graphic design, constantly reinventing himself through his career. He designed iconic posters and record albums for such clients as Bob Dylan, Poppy Records, and the School of Visual Arts. Glaser experimented with different techniques such as silhouettes, illustration, and photography (Meggs & Purvis, 2006).

Postmodern design was a movement started in the 1970's that can still be seen in design today. Postmodern design is characterized by three major directions, the early extensions of the International Typographic Style, new-wave typography, and the over-the-top mannerism of the 1980's (Meggs & Purvis, p. 466, 2006). Supergraphics was a term coined during this time to describe techniques used in graphic design. Supergraphics are bold geometric shapes of bright color, giant Helvetica letterforms, and huge pictographs spanning walls, bending corners, and expanding from floor to wall to ceiling (Meggs & Purvis, p. 467, 2006). The idea behind this

design technique was to bring life to an otherwise dismal, uninteresting architecture or environment. In 1974, Wolfgang Weingart produced *Typografische Monatsblätter* magazine. This magazine was a layered collage with overlapping images and using numbers and arrows to guide the viewer through the page instead of traditional left-to-right and top-to-bottom sequencing (Meggs & Purvis, p. 471, 2006). Weingart explored a new process with this piece involving multiple film positives and stacked masks that exposed with careful registration to produce one negative, which was taken to the printer. Meggs states about Weingart: “Weingart advocates the ‘Gutenberg approach’ to graphic communications: Designers, like early typographic printers, should strive to stay involved in all aspects of the process (including concept, typesetting, prepress production, and printing) to ensure the realization of their vision” (p. 472). This quote directly relates to the purpose and philosophy behind this study. During this time in the US, a retro movement was taking place, with many instances in book-jacket design. Vernacular design is the paraphrasing of earlier commonplace graphic forms of past decades and relates to retro design. This can be seen even today with sports teams referring to a past decade and design of uniforms.

The digital age completely revolutionized graphic design into what we know it as today. During the 1980’s, graphic design experienced a tremendous tool with the introduction of the personal computer, an Apple computer. The first Macintosh displayed graphics at 72 dots per inch (dpi), a huge accomplishment of the time. Also, users could interface with the computer through the use of the mouse. The use of the mouse let the user work creatively rather than in computer programming language. Apple released software for word processing, drawing, and painting. Early fonts were bitmapped and controlled by a matrix of dots. Adobe Systems Postscript was developed to enable printers to output text, images, and graphic elements, and

determine their location on the page (Meggs & Purvis, 2006). With the development of graphic design applications such as Adobe Photoshop and QuarkXPress, magazine and layout design went through revitalization during the 80's and 90's. Periodicals became easier to design and produce on much larger scales with the use of computers and print technology advancements. With the increase and accessibility of new technology to the public, graphic design saw a surge of new designers. The door was now open for anyone to use the tools of a graphic designer, which was a blessing and a curse. The public was flooded with imagery and design that at times was exemplary and at other times poorly conceived. In the early 90's, the World Wide Web was introduced to the public, giving a whole new arena to graphic designers. The Internet gave designers a medium to produce work and have it seen by millions of viewers instantly. This also gave new fields to the graphic designer in interactive design and Web design. New typefaces also became abundant and available for designers. This would prove to also carry negatives in that anyone could now produce fonts and put them on the Web for use. Most typefaces today are said to be poorly designed and only mere copies of previous fonts with a slight change or augmentation.

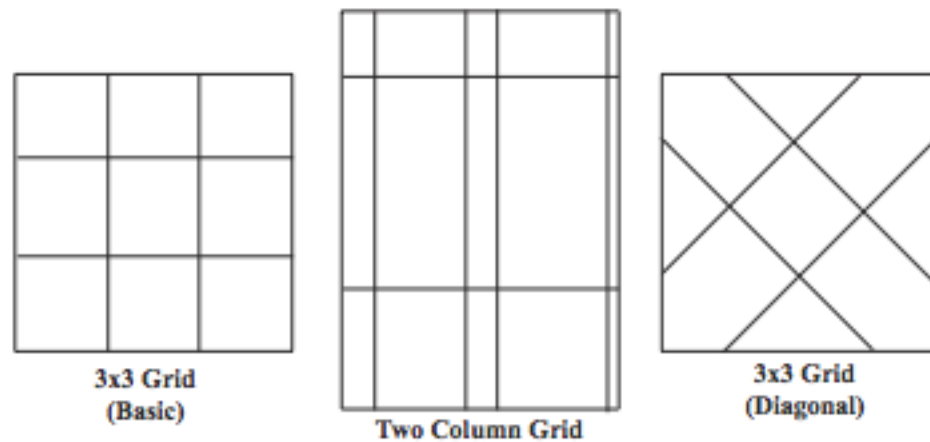
Graphic design history is invaluable to the graphic designer. Concepts, styles and processes from the past are constantly being used in today's design work. The history also shows the balance the graphic designer has played in the art and technology fields, being a mediator, in ways, of the two. By studying past styles and processes, the graphic designer is given a library of knowledge in which to use and build upon. Paul Rand states, "experience in the workplace and a thorough knowledge of the history of one's specialization are indispensable" (Jupert, p. 413, 2006).

Skill Sets in Design

The elements and principles of design are fundamental for a graphic designer. The elements of design are line, shape, direction, size, texture, color, and value. The principles of design are balance, gradation, repetition, contrast, harmony, dominance, and unity (Lovett, 1999). The principles of design can serve as a questionnaire to a graphic designer as they are producing a piece of work. Graphic designers must ask themselves if their work is balanced, if not, there must be a good reason why not, or the client or viewer will be thrown off and the message of the designer will not be conveyed properly. If gradation and repetition are used in a piece, is it used properly and is it the right technique to be used for their message? Contrast is used to draw a viewer in and to give focus where focus is needed within a piece by juxtaposing opposing elements. Harmony is used to provide a sense of peace within a work by placing similar elements together. Dominance is used to make certain elements stand out or create a hierarchy within a piece. This is done in many ways like using different size text, different fonts, different colors, to make an element stand out on the page. This technique is often used alongside contrast within a piece to create emphasis where it is needed.

Layout Design

The principles of design are used when a designer creates a layout. Layout design is the process of arranging graphic elements on a page. Layout design is also described as the overall design of a page, spread, or book, including elements such as page and type size, typeface, original images, illustrations and the arrangement of titles and page numbers. Arranging these items requires a structure or “blueprint” to create a harmony, flow, and consistency when dealing with more than one page. Grid systems can be used in order to guide the designer on where key elements of the design should go. Figure 1 shows three common grid systems in graphic design.



(Elam, 2004)

Figure 1. Grid Systems

The basic 3x3 grid allows the designer a wide range of possibilities of arranging elements on the page. Grouping of the elements is vital to layout design. When elements on the page are grouped, the visual message is given in a clear and efficient way by developing a visual relationship. By grouping similar and dissimilar elements a rhythm and repetition is created (Elam, p. 10, 2004). Negative space on a page is the empty space that is not occupied by elements of typography, line art, or images. When elements are not grouped on a page, more instances of negative space exist on the page, which to the viewer can appear chaotic and unorganized. By grouping elements, negative space becomes fewer and bigger creating a more cohesive layout (Elam, p. 11, 2004). When using the 3x3 grid, the rule of thirds corresponds to the layout of elements on the page. The rule of thirds suggests that at the four intersecting points within the composition lie the points of most importance and focus (Elam, p. 13, 2004). Following this rule allows the graphic designer to place elements of importance in these areas. Another way of placing important elements on the page is the theory of the “S” or “backwards S”. This theory suggests that the eyes of the viewer follow an “S” pattern when looking over a page. The viewers’ eyes will end up in the bottom right or bottom left corner, so the most

important element is placed there. Often in design the information of location, price, date, and time are placed in this position. This technique is also used in magazine and newspaper layout to place advertisements or photography.

Layout programs allow the graphic designer a tool to create designed pieces such as advertisements, brochures, books, flyers, and folders. The two most common layout programs are Adobe's InDesign and QuarkXpress. These two programs are the industry standard and will ensure a printer or client can easily receive the designer's work. Using these standards is essential in order to view or produce the piece in the way in which the designer has planned.

Web and Mobile Layout Design

Web design and layout is vastly different than with print layout. In Web layout the units of length are based in pixels (px). About five years ago, the basic dimensions for a Web layout were approximately 800x600 px. This has now changed with the more widespread use of widescreen monitors and increased screen dimensions. There is still some debate over just what dimensions a graphic designer should make a website, but a consensus is approximately 960x640 px. There is also a movement within Web design to make the design a responsive design, meaning the Web layout can adapt to whatever device the viewer is using to access the site, desktop, laptop, tablet, or smart phone. So, when designing this way the website can be scaled proportionally from approximately 320px to 1200px wide. This is accomplished through cascading style sheets (CSS) coding. CSS acts like a blueprint for hypertext markup language (HTML). CSS acts like a formula for how the HTML will act on the website. CSS outlines spacing, color, size and font issues with everything that is involved on the website. HTML is the publishing language for the World Wide Web. While this may sound like a standard coding language, the same website can be designed and the HTML can look extremely different from

one designer to the next. Solutions to this problem are currently being addressed in the research and implementation of HTML5. HTML5 is being established to answer problems in the coding of websites and to implement a standardization in website coding language. This is needed due to the rise in application use and development given the increase of different platforms. These issues will be an ongoing task for computer programmers and website designers which is a specialization of the graphic designer. Since the Internet is in ways a “free” way to advertise, more graphic designers are being asked to have Web design and interactive knowledge in job descriptions. So, with basic page layout and design, Web layout and design is becoming more prevalent a task for the graphic designer, which requires both an artistic background in the formal elements and principles of design, along with the technical aspects of coding and computer programs.

Typography

Typography is the art and technique of arranging type, type design, and modifying type. This skill covers one of the two basic elements of a page and layout design, the other being graphics. The use, arrangement, and style of type help, just as much as graphics, to convey the message of a graphic designer. Arranging of type involves the selection of typefaces, point size, line length, leading, tracking, and kerning (Samara, 2007). When selecting a typeface, a graphic designer must be aware of the readability and legibility of the typeface. These terms, to some, mean the same but are used in tandem to cover all aspects of character and function of a typeface. Knowledge of what typefaces need to be applied in a design helps to convey the message of a graphic designer professionally. Serif and sans serif are two basic categories of typefaces used in creating a layout. Manipulation of type is a useful skill in creating visually exciting elements on a page. By changing and arranging typefaces, a graphic designer can create

a shape or graphic out of letters. Line length and tracking are used differently depending on what publication or effect he/she is going for. In newspapers for instance, type is full justified to create a uniform and easy to read structure. The space between individual letters or kerning is not always uniform from font to font, so care must be taken in adjusting to create a professional and uniform font. Graphic designers must be aware of how to use type to their full advantage to create designs that are visually appealing and readable to the viewer. The terms used today in typography adjustment are derived from early typesetting and printing techniques. The term leading, referring to spacing between the lines of text, has its origin in early printing when skinny pieces of lead were used to increase the space between lines on a press or typesetter. Also, many of the typefaces used today were named after their originator or families that were heavily involved in printing and graphic design. The font Didot, for example, is named after a prestigious printing family in Europe that practiced for over two centuries (Jupert, p. 76, 2006). Other examples of fonts named after printers or their designers include Garamond, Baskerville, and Gill Sans.

Typography is essentially the essence of graphic design in terms of where the profession started. As discussed earlier in the history of graphic design, many typefaces have been generated over the years, whether it is by hand or digitally crafted. There is debate today concerning the over-saturation of typefaces from which the designer may choose. With typefaces easily generated, in theory, by the increasing access of design software to the public there is much concern over the care taken in the process of designing typefaces. Many have stated that designers today do not concern themselves with precedents in design and care of typefaces, and simply add to or take away from existing typefaces and rename them (Jupert, 2006). So, with this concern the graphic designer must not necessarily stick to the “classic”

typefaces, but be aware of the features and distinctions in typefaces. Some questions that designers need to ask themselves are:

Does the typeface work with the overall theme?

Is this typeface readable?

Does the typeface have uniformity?

Is the typeface all caps or all lowercase, or does it have both upper and lowercase?

Does the uppercase correlate to the lowercase?

Is the kerning and line spacing uniform throughout the typeface?

Along with these questions, the designer must decide on how to lay typefaces out on the page.

One general rule concerning typefaces is that a designer should not use more than two or three typefaces on a page, depending on the application. While this is a good rule, instances, such as if the design piece is intended to be a fine art piece, this rule can be thrown out.

When selecting typefaces, the designer should keep aware of the kind of typeface that is used. Windows and Macs use different typeface languages and can cause problems when sending work to another computer. There are a number of different types of files for storing fonts such as Opentype, Truetype, and Postscript type 1 (Johansson et al., 2007). Typefaces can have a similar name, but have a different file type, which can cause problems when moving from machine to machine. It is standard practice to send any fonts used with the document when moving from computer to computer and especially when sending to a printer. One way to work around having font issues, is to “create outlines” of typefaces used in the design. This treats type as if it were a drawn shape rather than a font, so no issues will arise from missing fonts or different fonts being placed automatically.

Photography

Photography is a skill that helps a graphic designer in several ways. Since images are one of the key components in a design layout, being able to distinguish between good photography and poor photography becomes useful knowledge to the designer. This knowledge gives the designer the ability to place the correct image to convey the message or statement that is intended. The ability to perform photography gives the designer a resource that would otherwise be outsourced to another individual or agency. Often times a graphic designer will be called to art direct a photo shoot, so knowledge of how to arrange a photo becomes important, so this process can be done efficiently. Being able to arrange a photo or being able to notice a photographic opportunity helps the graphic designer train their eye for design and layout. Understanding the composition of a photograph also helps to train the eye of the graphic designer. Understanding the direction of the light source and shadows along with the perspective of an image allows the graphic designer to use these elements in the entire layout of the piece. Good photos consist of a nice range of tones. The three tones to consider in a photograph are the highlights, mid-tones, and shadows. High contrast images often have high values in the highlights and shadows region with very low values in the mid-tones, if any. High contrast is not always needed, which is a pitfall of the emerging graphic designers, that feel high contrast images make the piece more interesting. While this thought may have some validity, a truly good photo has a wealth of mid-tones along with highlights and shadows. This means there is a multitude of color in the image and a slower variation in color.

Some of the more technical aspects in dealing with photography are the use of digital images and image editing. Since digital photography is becoming more of the norm according to the professionals, understanding of file formats, compression, and resolution become important.

When digital images are taken with a digital camera, the photographer can decide whether or not to convert the image to traditional red, green, blue (RGB) color palette or leave the image in the RAW format. RAW format is an image mode that has all the information the sensor within the camera that took the picture received when the picture was taken (Johansson et al., 2007). This allows for a lot more color information and vividness of color that the graphic designer can use and edit. Compression is an issue with image editing programs that deals with file size and color information. Images are compressed in order to send or make memory available on whatever device the graphic designer is using. Image files can become very large so this feature is handy in allowing your device to run smoothly and quickly. The three most common compression types are Lempel, Ziv, Welch (LZW), ZIP, and Joint Photographic Experts Group (JPEG). LZW and ZIP are lossless compression types, which means they do not lose any color information. JPEG is a lossy type of compression, which means as the file is reduced, more color information is lost. This may sound like a risk for the graphic designer but JPEG compression can be set to a certain amount of information lost, which in the least values, color information lost is not visible to the naked eye (Johansson et al., 2007). The resolution of the image refers to the quality of the image value. Resolution has three variables that the graphic designer needs to consider, pixels per inch (ppi), dots per inch (dpi), and lines per inch (lpi). The higher each of these values are the higher the quality of the image. Images used on the Internet are usually 72 or 96 dpi, while images for print are usually 300 dpi or above.

Many of the techniques and terminology in the photographers' dark room have made their way into design programs, most noticeably Adobe's Photoshop. Techniques such as dodging, burning, exposure, and masking have all come directly from the dark room to the

design program. Traditional photography skills are not detrimental to a graphic designer's success, but the skills are a valuable tool in the arsenal of a graphic designer.

Drawing

Drawing is a valuable skill to possess as a graphic designer. Developing drawing skills takes time and practice in various mediums. The ability to draw gives a graphic designer a tool to translate and build ideas on paper before going to a final substrate. Thumbnail drawings are often used to form ideas and get placement together in a layout before going to another medium. Illustration is used in graphic design at times instead of photography to give a personal touch to the design. Drawing provides skills that translate on to a computer, which is now one of the main tools of a graphic designer. With the introduction of styluses and tablets, drawing can now translate directly to illustration programs. With the use of a stylus and tablet, the graphic design can draw directly on the screen and have it be created in real time on the program. This saves valuable time for the graphic designer, which would otherwise be spent recreating a drawing or scanned image by tracing. One of the tools that directly relates to drawing in some of the design programs is known as the Pen tool. The Pen tool allows the graphic designer to make and manipulate lines to create outlines or trace an image. The Pen tool also allows the user to create a precise selection and is often used to create a clipping mask in Adobe Photoshop.

Color

Color is essentially the way humans perceive light at different frequencies (Johansson et al., p. 69, 2007). Color theory is the practical use of color mixing and the visual impacts of color combinations. Understanding color and the uses of color is of great importance to the graphic designer. Color can provide the mood and be a significant part of the message the graphic designer is trying to get across. The Pantone Matching System (PMS) is a way for printers to

identify and use spot colors. PMS is used when colors are hard to reproduce in the standard four-color print process (Johansson et al., p. 75, 2007). A good method to determining color palettes or schemes is to use a Pantone swatch book. A Pantone swatch book is a book that contains values of color and the amounts of cyan, magenta, yellow and black (CMYK) they contain. These values let the graphic designer make the specific color they want to use in a four-color system and are a way to translate the color for the printer to use. It is important to note that not all Pantone colors can be recreated using the CMYK system. Spreading out a Pantone book can help the graphic designer see the relationships of colors and identify a specific type of color such as a type of blue. Printers use the three primary printing colors of CMY to produce ink. This method of using CMYK is called subtractive color mixing (Johansson et al., p. 72, 2007). Often companies will have a signature color or set of colors that identify who they are. It is important for the graphic designer to establish this color in the design and pass along the color profile to the printer. The printer will mix or order the ink and use it specifically for that piece. Many companies specify an exact type of ink and color, such as Coca Cola and their signature red (Eldred, p.139, 2001).

Red, green, blue (RGB) is known as additive color mixing. Additive color mixing got its name from the fact that the graphic designer is actually adding RGB light to a mix in order to create new colors (Johansson et al., p. 71, 2007). Monitors and TV screens use this method of color adding to produce colors because the light sensors in the human eye are red, green, and blue cones. With the RGB system the graphic designer is able to create 16.7 million different color combinations (Johansson et al., p. 72, 2007). There is a problem with this system though. The RGB system is not a universal standard in the sense that any color produced using the system will look the same on different monitors. Often monitors are calibrated to a degree or to

a certain printing source to allow for more accurate color production from monitor to printed piece. This is essential in print production because the colors are changing color systems, RGB to CMYK.

The standard for color management is known as the International Color Consortium. The ICC is based on three different elements, CIELAB, ICC profiles, and software Color Management Module (CMM). CIELAB is the device-independent color space, which is the only means of describing colors precisely. ICC profiles are correction tables for measuring characteristics and defects of certain devices such as, scanner, monitors and presses. CMM calculates color conversions between different color spaces using the values of the ICC profiles (Johansson et al., p. 84, 2007). This is essential to the graphic designer to understand that what is created on one monitor or device is not necessarily going to look the same as another device. Working with the ICC system gives the graphic designer the ability to create and produce what is created with little to no change when moving from device to device or from monitor to print production.

Craftsmanship

Craftsmanship can be defined as work performed by a knowledgeable individual that is consistently of high quality. Gaining skills in various art mediums gives the graphic designer the ability to use various tools when designing work. Learning craftsmanship comes with actually going through the process of developing an idea, communicating it well, and seeing it through the production process. A graphic designer learns the skills needed in the process to accomplish a job that is of high quality. When this is done consistently at a high level, the success of the designer is great monetarily and spiritually. The process of creating is what drives a graphic designer to produce work and can be fulfilling. The graphic designer is essentially a visual

communication problem solver. He or she has the task of communicating a message through images and text to the intended viewer in order to get a response. Recently, designers are becoming more involved in the marketing of products and ideas, combining forces with their clients, to decide direction, message, and demographics that their product would best benefit.

Skill Sets in Technology

The skill sets within design are translated by the graphic designer with the use of technology, so design and technology must work in unison to produce a piece of work by the graphic designer. The graphic designer must come up with the idea, create the piece, and produce that piece so others can view it. Historically and today, technology gives an invaluable tool to the graphic designer to create and produce their work. Since this profession began, technology has played an integral role, along with art and design, in the work of the graphic designer.

Computer Programs

Computer design programs allow graphic designers to produce design and layout to communicate the message of a company or product. These programs allow the graphic designer to use the skill sets within design. Computer technology changes at a rapid pace. Minor updates to software and hardware have become a monthly occurrence with major updates becoming an annual occurrence. A graphic designer must stay current with these technological changes since the computer is the main tool that is used to produce the end product or final design. The graphic designer must have extensive knowledge in computer design software including, Adobe Photoshop, Illustrator, and InDesign. Photoshop is an image editing software program used to manipulate and convert images. Photoshop is a pixel-based program, which means images are created using small squares of color to produce an image. With Photoshop, the graphic designer

can correct color, fix damages to photographs, convert color systems and add and subtract from images. Images can be made-ready for the Web or for print. “Mastering Photoshop is a process, not an event. No matter how much you know about the program there is always more to discover. Professional artists stumble onto new techniques virtually every time they use the program” (Poysick, p. XVIII, 2005). Illustrator is essentially a drawing program. Illustrator is a vector-based program, which means it uses mathematics in order to determine shape and value, essentially the distance between two points. The graphic designer can make and manipulate two-dimensional and three-dimensional art using Illustrator. The graphic designer can manipulate text most preferable in Illustrator. Illustrator is preferred because it is a vector-based program and resolution is not an issue. Type within Photoshop is pixel-based, which causes resolution to suffer when resizing and with manipulation because of the inference the computer has to accomplish when determining color information. Illustrator is also preferred when creating and developing logos for this same reason. Often logos are placed on a number of different substrates and are sized differently according to those substrates. InDesign is a layout program. InDesign is used to create the final product for much of the graphic designers’ work, such as posters, letterheads, resumes, books, magazines, and advertisements. These programs have become the standard in design and layout software used universally by designers and printers alike (Perkins, 2010).

Each of these three programs has tools and menus that generally work the same. There are some exceptions to this such as the Lasso tool in Photoshop and the Lasso tool in Illustrator. Each is used for selection, but the Lasso in Illustrator is used for shapes and items created in Illustrator, not images brought into Illustrator. Understanding how these programs can be used

together and how they operate moving a piece of work from program to program is essential to the workflow of the graphic designer.

File types are an important aspect to computer programs and production of work created by the graphic designer. There are many different file types and each operates in a different way. Object graphics are logotypes, news graphics, and illustrations. File types that are used for object graphics are Portable Document Format (PDF), Encapsulated PostScript (EPS), and Adobe Illustrator (AI). PDF files can include pixels, typeface, and curved objects. PDF is a semi-universal file format that can be used and also edited in various programs. EPS file format can be used for object based graphic, but the format contains limitations such as it does not retain all the editable features and the file format is different in Mac and Windows systems. AI is the native file format for Adobe Illustrator. The only drawback to this file format is it cannot be used by all layout software, but since InDesign has been established as a standard in layout programs this is no longer a problem. File formats for pixel-based images are Photoshop format (PSD), Tagged Image File Format (TIFF), EPS, PDF, Joint Photographic Experts Group (JPEG), Graphic Interchange Format (GIF), and Portable Network Graphics (PNG). PSD is the native format for Photoshop and can handle most color modes. TIFF is an open image format that can be smaller in size but cannot handle clipping paths or halftone screen information. EPS and PDF files act the same in pixel-based objects. JPEG is a compression method for images but the compression type is lossy. GIF and PNG file formats are used for Web-based graphics. PNG graphics cannot support animation while GIF format can (Johansson et al., 2007).

Understanding how these file formats operate when moving from program to program allows for easier workflow and avoids headaches when files do not act properly. One instance that often comes up is when logos created in a program have a transparency layer and are moved to a

layout program the transparency is filled with white. This can be avoided by using the native file format of the program or by an option in the process of saving the file that retains the transparency layer.

Knowledge is also needed in Web design and animation programs such as Adobe Dreamweaver and Flash. Dreamweaver is a program that the graphic designer uses to lay out and code a website, primarily in HTML. Flash is a program that adds animation and interactivity to a website. Often on the Internet, users are bombarded by advertisements of all sizes and small videos of products that a graphic designer creates. Since more advertising and graphic design is moving towards the Internet and mobile devices, learning how to create websites and online graphics has become an advantage for the graphic designer and also these skills are now been required in job descriptions.

Other programs designers use might include 3D animation software, such as 3Dstudio Max and Autodesk's Maya software. These software applications are a specialization of the graphic designer, but can be very useful in creating images for posters, interactive ads for Web, or features on a website.

Adobe products have started to update each year with a newer version of their software suite; their current software suite being Adobe CS5, with an update just occurring labeled CS5.5 (Adobe, 2010). Staying current with new features offered within software updates falls on the graphic designer. These new features will give the graphic designer the ability to perform their tasks more easily and effectively in shorter amounts of time. Management of computer skills and knowledge is important in creating a workflow that uses time effectively (Pride, Hughes, & Kapoor, p. 503, 2002).

Print Technology

Print technology is vital knowledge for the graphic designer. Without print technology most of the graphic designer's work would remain virtual, that is to say on screen. Print knowledge allows the graphic designer to know how to form their design to be manufactured or finally produced. A graphic designer needs to know how, where, what, and how many pieces are being printed. This knowledge is essential for production of work. The graphic designer is often in charge of determining the specifications of a printed piece. This means the graphic designer will need knowledge of printing processes, paper, and inks. The designed piece often determines what printing process, paper, and ink will be used to carry out the job specified. If brochures were needed, the process would often be offset lithography or digital. The paper would be a certain weight and often times partially or fully made from recycled materials. Depending on the printing process and press, paper is either sheet-fed or web-fed, web-fed is a roll of paper rather than individual sheets (Wilson, p. 100, 2000). This knowledge will determine the amount of signatures that will be printed. A signature is a full sheet with several printed pieces that will be cut and folded later to form a full printed piece. Education in these processes is vital to understand cost of a finished printed product.

Print technology is ever changing. Printing processes like flexography, lithography, and digital printing have moved closer and closer to automation. These processes are being simplified so printing can become more efficient and less costly. Fifteen years ago many of the pre-press processes were thrown out because digital technology could do these processes more efficiently and effectively. The use of typesetting, film production and exposure have all been substituted out for digital processes (Stock-Allen, 2010). It is important to understand these advances in printing because a graphic designer is usually working on a deadline. Knowing the

processes helps the graphic designer plan according to the time constraints. Since these processes have moved closer to automation, more time is given to the graphic designer to create and produce their idea.

The main issue in print technology for the graphic designer is retaining color quality from computer screen to print. As discussed in the Color section, the ICC color system is used to determine color values between devices. Often the graphic designer will go on press checks to check the progress of a printed piece and to examine the color of that piece. This is when changes can be made to the piece if colors are not correct or if there was a mistake made in the creation of the document.

Related Research

While the field of graphic design has adapted over the years to the ever-changing technology, within the last five years there has been a rapid influx of new media and ways to communicate visually. This poses a problem for the graphic designer and educators in the study of graphic design. The graphic design field was once a reserved section of design left to those educated in specialized art programs. Today with the ease of accessibility to design software and relatively lower costs than in the past to printing and technology, anybody with a computer can generate a type of graphic design. This idea should not be confused with giving that individual the title of a graphic designer. Knowledge in only one discipline of graphic design, whether it is design, technological, or humanities and problem solving, does not qualify an individual as a graphic designer. The idea of only having one of these skill sets leads to a lot of poorly designed and conceived graphic design. Many experts have discussed this with the introduction of new, free fonts on the Internet that are inconsistent and just a remake of another font with a subtle

change. While there are numerous books and blogs written giving opinions on this topic through the years, most consist of only one viewpoint: practical, artistic, or technical.

Adobe and American Institute for Graphic Arts (AIGA) began a study in 2006 to evaluate the field of graphic design and to see where the field is heading. The study consisted of 2,500 “of the profession's best thinkers-educators, observers of the field and AIGA members” (American Institute for Graphic Arts [AIGA], 2007a). The study identified essential competencies that will be needed in various fields that the graphic designer will need. According to AIGA study (2007b), the key competencies, in order of importance, which will be needed by a graphic designer are:

Ability to create and develop visual response to communication problems, including understanding of hierarchy, typography, aesthetics, composition and construction of meaningful images

Ability to solve communication problems including identifying the problem, researching, analysis, solution generating, prototyping, user testing and outcome evaluation

Broad understanding of issues related to the cognitive, social, cultural, technological and economic contexts for design

Ability to respond to audience contexts recognizing physical, cognitive, cultural and social human factors that shape design decisions

Understanding of and ability to utilize tools and technology

Ability to be flexible, nimble and dynamic in practice

Management and communication skills necessary to function productively in large interdisciplinary teams and “flat” organizational structures

Understanding of how systems behave and aspects that contribute to sustainable

products, strategies and practices

Ability to construct verbal arguments for solutions that address diverse users/audiences; lifespan issues; and business/organizational operations

Ability to work in a global environment with understanding of cultural preservation

Ability to collaborate productively in large interdisciplinary teams

Understanding of ethics in practice

Understanding of nested items including cause and effect; ability to develop project evaluation criteria that account for audience and context

While the AIGA study provided a wealth of information on where the graphic design field is headed, this study will identify further those skill sets needed within design and technology that the graphic designer will need to be successful. This additional information provides educators insight into what subjects within design and technology should be discussed in order to create successful graphic designers. A major trend discussed in the AIGA study (2007c) was “Designers must be able to draw on experience and knowledge from a broad range of disciplines, including the social sciences and humanities, in order to solve problems in a global, competitive market of products and ideas.” So, there is recognition of the broadness of knowledge needed in the professional graphic design field.

Summary

The related literature on the field of graphic design is plentiful with a wide variety of perspectives. Graphic design history proves intimate knowledge of the field of graphic design featuring various styles and technological achievements through the years. With the introduction of computer technology in the 1980’s, and the World Wide Web in the 1990’s, the field of graphic design has changed rapidly. Identifying essential skill sets in graphic design becomes a

challenging task and a necessity in an ever-changing field. Success in the field of graphic design depends on knowing and understanding these essential skill sets, as indicated in item 4 of the 2007 AIGA study.

CHAPTER 3

Methodology

Design of the Study

A modified Delphi study was used to identify the essential learning objectives of a post secondary graphic designer. A modified Delphi study was used because it was deemed the most efficient way to get a panel of experts in graphic design to develop a consensus regarding what is essential in the graphic design curriculum. The Delphi study or method refers to a:

A forecasting approach that uses a panel of experts, whose identities are typically kept confidential from one another, to respond to a sequence of questionnaires. After each round of responses, individual opinions, edited to ensure anonymity, are shared, allowing each to see what the other experts think. Seeing other experts' opinions helps to reinforce those in agreement and to influence those who did not agree to possibly consider other factors. In the next round, the experts revise their estimates, and the process is repeated, usually for no more than two or three rounds (Evans, p. 238, 2010).

The study will consist of three rounds of 32 Delphi instrument items concerning essential learning objectives or skill sets for graphic design. In round one, participants were asked to rate the importance of an item on a five-point scale. Comments and suggestions will be strongly encouraged and after the first round, items may have added. Items may be eliminated if there is a consensus reached on an item regarding it being rated as unimportant. An item may also be eliminated from the list if consensus is never reached across all three rounds of the Delphi study. In Round two, participants will be shown their responses compared to the other participants and asked to either retain or change their responses to agree with the consensus. Items may have also been added and participants will rate and comment on those items. Items are retained when the

expert panel reaches consensus on an item being important. Round three, participants will be asked again to change their rating to the majority or retain their original rating and justify why they are retaining it. The interquartile range was used for a statistical measurement. The interquartile range is the range of ratings within the middle fifty percent. In this study, an interquartile range of one or below was desired for agreement or consensus from the participants. Once a consensus is found, the essential learning objectives will be listed in order of importance.

Research Question

The following question is the basis for the study:

What do graphic designers need to know and be able to do in order to succeed in the graphic design field now and in the future?

Since the literature review has presented the broadness of the field of graphic design, the question is relevant to discuss with current experts in the field of graphic design.

Sample

A modified Delphi study is used to survey a panel of 30 experts in the field of graphic design. The sample size and location of qualified experts is based on a sample of convenience. However, because participants are experts in the field, the sample size for Delphi studies is less important than it is in traditional survey research (Hsu & Sandford, 2007). The researcher attempted to identify and contact enough experts to make an adequate modified Delphi study expert panel. The sample surveyed is limited to the number 30, but this number is adequate for a modified Delphi study given that all participants were qualified as experts. An individual must meet certain criteria to be qualified as an expert in graphic design. Experts will be individuals that have ten or more years in the field of graphic design, an Associate's or Bachelors degree in graphic design or equivalent field of study, and the title of Art Director or equivalent title related

to the field of graphic design. Individuals who are currently professors or educators will not be considered for this study in order to avoid bias regarding their own graphic design curriculum. According to Ericsson, Krampe, & Tesch-Römer (1993), individuals in various fields produced their best work and performed the most effectively and efficiently after ten years in their respective fields (p.363-406). Cross (2004) states of experts:

Clearly, part of the development of expertise lies in the accumulation of experience.

Something that distinguishes experts from novices is that the experts have been exposed to a large number of examples of the problems and solutions that occur in their domain.

But a key competency of an expert is the ability mentally to stand back from the specifics of the accumulated examples, and form more abstract conceptualizations pertinent to their domain of expertise. Experts are believed to be able to store and access information in larger cognitive "chunks" than novices can, and to recognize underlying principles, rather than focusing on the surface features of problems (p.427).

Individuals will be qualified as experts before being asked questions regarding essential learning objectives of a graphic designer. The sample will consist of freelance and corporate graphic designers. The qualifying questions on the first round survey will be:

Qualifying Questions

What is your current title and place of business?

How many years of professional graphic design experience do you have?

What is the title of your degree and from what institution did you receive your degree?

Are you currently or have you been a freelance designer or corporate designer or both?

The participants and responses will be kept completely confidential.

Measurement Instrument

The essential learning objectives or skill sets will be rated by importance on a five-point scale; one being of least importance and five being of most importance. The statistical measure to show the majority response, and eventually consensus is related to central tendency.

“Measures of central tendency provide estimates of a single value that in some fashion represents “centering” of the entire set of data” (Evans, p. 44, 2010). The central tendency in this study is found using the interquartile range. The interquartile range is the range of values of a frequency distribution between the first and third quartiles or the middle 50 percent. The interquartile range, given the five-point rating system employed on this study, is one or less. This method is being used to show a consensus amongst participants in this study.

Data Collection

Once the participants were identified and qualified as experts, three rounds of Delphi instrument items were used to collect data. Three rounds of items are typical for this type of modified Delphi study. Essential knowledge/skill sets were then put in order of importance at the conclusion of round three.

Round one items consisted of 32 essential learning outcomes that each participant would rate in importance. Round one items can be seen in Appendix C. Round one allows the expert panel to individually rate items and establish comments about their rationale for the ratings. This will provide a baseline for the individual to compare his or her ratings to the median rating of the majority. Round two questions have two purposes: one, to compare the participant’s individual rating of an item to the other participants’ ratings of the item. This would give the participant a chance to change his or her rating if he or she chooses to do so. The range in which the middle 50 percent of participants rates an item will indicate a majority opinion about the importance of

an item. The other purpose of round two questions is to initially rate any new item that participants have indicated need to be included. Round three will have similar purposes as round two, to compare individual ratings to the other participants and to rate new items that participants have indicated need to be included. When consensus is reached about an item being unimportant, that item will be dropped from the instrument. Three rounds will help to provide a consensus or agreement in the group of experts over the importance of the different skill sets within graphic design. See Appendix C for the Round One instrument.

Validity and Reliability

The 32 Delphi instrument items regarding the essential learning objectives or skill sets of a graphic designer have been reviewed by a jury of experts, who did not participate in the actual study to establish face validity (do the questions appear to measure what they are intended to measure). The purpose of the review was to improve any items. Also comments and essential learning outcomes added after round one of questioning will be included in round two and their validity will be established by the participants' ratings and by virtue of the fact that the panel members qualified as experts.

It should also be noted that the study intends to gather a consensus from graphic design experts, so opinions may vary. Comments from participants will add validity to the study by modifying the instruments where needed.

Timeline of Study

The study began on October 27, 2011, after validation of Delphi instrument items by a jury of experts. Then individuals were asked to participate in the study and qualified as experts. Round one questioning is sent out and participants are given approximately one week to respond. Round one is analyzed and round two is sent to the participants and they are given approximately

one week to respond. Round two is analyzed and round three is given to participants and they are allowed approximately one week to respond. The total process takes approximately 6 weeks to complete. After completion of the modified Delphi study, analysis and interpretation was conducted.

CHAPTER 4

Findings

Modified Delphi Study

With regards to the qualifying questions, participants' experience in the field of graphic design or related field averaged 18.73 years. The range of years experience is 32-10=22. Over 150 people were contacted to be participants. Thirty-two individuals agreed to participate in Round 1 of the Modified Delphi Study. The majority of participants were freelance graphic designers. All participants had at least 10 years of experience. All participants also received a two or four-year degree in a graphic design or graphic design related field. Table 1 shows different demographic topics of interest:

Table 1

Demographic Information

Topic			
Years of Experience	10, 12, 13, 14,15,16, 18, 19, 20, 22, 23, 25, 27, 30, 32		
Degree Type	# of 2 Year: 4	# of 4 Year: 24	# of Both: 4
Job Type	# of Company: 2	# of Freelance: 4	# of Both: 26

Round 1

In Round 1, participants were asked to identify and rate in importance those graphic design skill sets/knowledge that students who study graphic design or related field in a post secondary institution should gain prior to graduation. Participants were also asked to comment on items, add any new items and rate any new items they added. An explanation of the scale on which to rate each item is provided in Table 1.

Table 2

Explanation of Ratings

In all three rounds of the study, the instrument asked participants to rate an item on a five point Likert scale. The ratings are described below:	
1.	Least Important: Not necessary for a graphic design curriculum.
2.	Less Important: Less than necessary for a graphic design curriculum.
3.	Important: Necessary for inclusion in a graphic design curriculum.
4.	More Important: Essential for inclusion in a graphic design curriculum.
5.	Most Important: Most essential for inclusion in a graphic design curriculum.

The interquartile range (IQR) was used as the statistic for central tendency of rating responses and an IQR of 1 was determined by the researchers to indicate consensus on an item (Wicklein, 1993). The middle fifty percent of responses was used as the majority rating for each item. Twenty-eight participants were deemed qualified as experts by the qualifying questions. Twenty-one out of 32 items achieved consensus after Round 1.

Round 2

In Round 2, participants were provided with their own ratings per item respectively from Round 1, were provided the ratings that fell within the IQR per item, were asked to rate items with the majority (within the IQR) or to justify why they did not join the majority, reword newly added items, provide comments. Only 27 of the 28 Round 2 instruments were returned. An IQR of 1 or less represents consensus on an item's rating. Consensus was lost on Item 10, and consensus was gained on Item 26 of the original 32 items. Eleven items were added after Round 1, for a total of 43 items to rate in Round 2. Twenty-nine items achieved a consensus after Round 2. No items were dropped after Round 2 due to a lack of consensus on a low rating.

Round 3

In Round 3, participants were provided with their own ratings per item respectively from Round 2, were provided the ratings that fell within the IQR per item, were asked to rate items

with the majority (within the IQR) or to justify why they did not join the majority, and to comment on any item. Please refer to Appendix A for rounds 1, 2, and 3 analysis.

Table 3

Consensus Items.

Item #	Skill Set/Knowledge
1	Understand the elements of graphic design; line, shape, direction, size, texture, color, and value.
2	Understand the principles of graphic design; balance, gradation, repetition, contrast, harmony, dominance, and unity.
3	Understand drawing techniques, including different mediums such as pencil, ink, and charcoal. Know how to draw to construct concept.
4	Understand graphic design history in regards to the evolution of the field in graphic design styles and graphic design technology.
5	Know the history and the applications of typography.
6	Know Advertising and Marketing; types styles, etc
7	Differentiate high quality design from poor quality design.
8	Develop the ability to problem solve
9	Develop the ability to work on a team as a team leader and team member.
10	Know the design process.
11	Understand layout design for printing and for Web.
12	Knowledge of printing design software such as Adobe Photoshop, Illustrator, and InDesign and working with this software in combination with each other.
14	Know file types (.jpg, .tif, .psd, .pdf, etc.), their operation, advantages, and disadvantages of each.
15	Understand photo composition.
16	Understand photography dark room techniques, traditional and digital.
18	Understand 3D animation software, such as Autodesk's 3Dstudio Max and Maya.
22	Know how to construct a book portfolio and digital portfolio
23	Understand entrepreneurship with regards to the business aspects of freelancing.
24	Understand the operation of a graphic design company or organization.
25	Know uses of various Internet activities, such as social networking, for self-promotion.
26	Know printing applications for various substrates and ink types.
28	Know how to listen, write and speak effectively (good communication skills).
29	Know current trends in the graphic design field
31	Learn how to conceptualize design that follows a strategy
32	Learn design as a solution to solving real world problems Through an internship or class with actual clients, products, or a company.

Table 3 Cont.

33	Understanding of culture, where it has been and where it is going.
34	Learn how to give constructive input on design work
35	Learn how to manage other designers/creatives
36	Know how to conceptualize with a copywriter to solve design problems
37	Learn CMS tools (Wordpress, Joomla, etc.) and how to design using them
39	Strong, effective production skills as well as design
40	Understand client needs, and deliver on time.
42	Learn about licensing of images, music, video, etc. for resources for design work.

Item 18 reached a consensus, but the consensus was a rating of Less Important, while all other consensus items rated an Important or better rating.

Consensus Items in Order of Importance

The following items had an IQR of 0 and had a median rating of 5 (Most Important):

- Understand the principles of graphic design; balance, gradation, repetition, contrast, harmony, dominance, and unity.
- Develop the ability to problem solve.
- Knowledge of printing design software such as Adobe Photoshop, Illustrator, and InDesign and working with these software in combination with each other.
- Know how to listen, write and speak effectively (good communication skills).
- Understand client needs, and deliver on time.

The following items had an IQR of 1 and had a median rating of 5 (Most Important):

- Understand the elements of graphic design; line, shape, direction, size, texture, color, and value.
- Know the history and the applications of typography.
- Differentiate high quality design from poor quality design.
- Develop the ability to work on a team as a team leader and team member.

- Know the design process.
- Understand layout design for printing and for Web.
- Know file types (.jpg, .tif, .psd, .pdf, etc.), their operation, advantages, and disadvantages of each.
- Understand photo composition.
- Know how to construct a book portfolio and digital portfolio.
- Learn how to conceptualize design that follows a strategy.
- Learn design as a solution to solving real world problems, through an internship or class with actual clients, products, or accompany.
- Learn how to give constructive input on design work.
- Know how to conceptualize with a copywriter to solve design problems.
- Strong, effective production skills as well as design.

The following items had an IQR of 1 and had a median rating of 4 (More Important):

- Understand drawing techniques, including different mediums such as pencil, ink, charcoal. Know how to sketch and draw to construct concept.
- Know Advertising and Marketing; types styles, etc.
- Understand entrepreneurship with regards to the business aspects of freelancing.
- Understand the operation of a graphic design company or organization.
- Know current trends in the graphic design field.
- Understanding of culture, where it has been and where it is going.
- Learn how to manage other designers/creatives.
- Learn about licensing of images, music, video, etc. for resources for design work.

The following items had an IQR of 1 and had a median rating of 3 (Important):

- Understand graphic design history in regards to the evolution of the field in graphic design styles and graphic design technology.
- Understand photography dark room techniques, traditional and digital.
- Know uses of various Internet activities, such as social networking, for self promotion.
- Know printing applications for various substrates and ink types.
- Learn CMS tools (Wordpress, Joomla, etc.) and how to design using them.

The following item had an IQR of 1 and had a median rating of 2 (Less Important):

- Understand 3D animation software, such as Autodesk's 3Dstudio Max and Maya.

CHAPTER 5

Discussion

There were numerous comments posted in the Rounds 1, 2, and 3 instruments, which show the expert opinions of the participants on the outcomes of each item. These comments were listed on each of the Round 2 and Round 3 instruments. Please refer to Appendix B for comments from round 1, 2, and 3 instruments.

Consensus Items

As of Round 3, there are several consensus items that provide reinforcement of the importance of skill sets/knowledge that graphic design students should acquire while in a post-secondary institution. The researcher defined groupings based on concept. Groupings are Design, Formal Concepts, Technology & Production, Professional World, Self-promotion, and Communication.

Items in the Design group are: Items 1, 2, 4, 5, 6, 7, 10, 11, and 31. Each design group item was rated More Important to Most important. A summarization of comments in support of these items include the following:

1. Understand the elements of graphic design; line, shape, direction, size, texture, color, and value.
 - This is core knowledge that many seem to forget these days, using the computer as a crutch rather than a tool to implement the above.
 - Color theory is very important—it is good to have when backing up a proposed color scheme.

The panel rated this item with a median rating 5 (Most Important). The panel suggests that this item is the base structure of design and design theory. The elements of design give an individual the foundation one needs in understanding design and what designs incorporate.

2. Understand the principles of graphic design; balance, gradation, repetition, contrast, harmony, dominance, and unity.
 - As you become more experienced and view a lot of great work (and compare yours to it), you will absorb this. It may however be helpful to learn some terminology for when you are explaining or defending your work.
 - Critical knowledge. Same as the elements of design.

The panel rated this item with a median rating of 5 (Most Important). The principles of design, along with the elements of design, are the two main foundation items in design. These two items are universal to all art disciplines, not just graphic design. These items provide a starting point of understanding of what is incorporated in a design and why the elements of design are used to bring out principles of design. The terminology used when discussing the principles of design, give the student an appearance of intelligence and understanding of design when discussing their design to a client or audience.

4. Understand graphic design history in regards to the evolution of the field in graphic design styles and graphic design technology.
 - History is always good to know.
 - Important to become a more complete designer.

The panel rated this item with a median rating of 3 (Important). This item gives the designer a wealth of knowledge about the field of graphic design. The panel suggests that knowing where design has been and the events in graphic design history that have influenced the field, helps to

create a more complete designer. The designer can gain an understanding of styles throughout history and use those styles to inspire later work. It is also interesting to note that graphic design and styles are often influenced by social and economic events occurring during the same time as certain design movements. An example of this is World War II and propaganda design.

5. Know the history and the applications of typography.

- Critical knowledge. Everyone should watch the documentary Helvetica.
- Typography is vital. Maybe not the history as much as the application, the new applications allow for so many bad habits.

The panel rated this item with a median rating of 5(Most Important). Typography is major component of graphic design. The panel feels this is crucial to design. The application of typography, the ways and styles of typography that are implemented, are vital in producing high quality design. There are pieces of graphic design that are nothing but typography, so it is of great importance that a graphic design student have a strong understanding of typography.

6. Know Advertising and Marketing; types, styles, etc.

- You need to know about different types of advertising and marketing. Your designs will change depending where it is going to be used. Example: a B2B environment vs a B2C environment.
- It will be important to distinguish the differences between various types of agencies/marketing firms to determine the best fit for yourself. Know the name of the agency too. Do not just like a commercial or a print ad. Know who did it. Then figure out how they agency got the client to agree to it.
- You have to know the terminology.

The panel rated this item with a 4 (More Important). The panel suggests that the graphic design student needs a strong understanding in the markets of each design is made for. A participant gives the example of a business to business (B2B) environment and a business to consumer (B2C) environment and how they differ in terms of how a design is constructed and implemented. The panel also suggests on understanding the difference in agencies and their clients in order to find the best fit for a graphic designer. The graphic designer should apply himself or herself at an agency or firm where he or she can bring the most value and where their particular skills are most needed. It is also important to the designer to understand what strategy and designers from a particular firm executed the design work and what ideas were used to implement the design to the audience. Knowing how the product is used and seen is vital knowledge to a graphic designer producing designs for that product.

7. Differentiate high quality design from poor quality design.

- If the graphic designer cannot do their work will be the poor quality design. Promise.
- If you cannot identify high quality design then you sure are going to have a hard time consistently producing it! Or be able to convey in words (to a client, etc.) what constitutes an effective design and why it works. Again, you have to be able to back up your designs.

The panel's comments reveal that a vital aspect of producing design work is knowing why that particular design is effective and meets the requirements of the client and audience. Building an understanding why designs work and why they do not help to create and promote good habits in a designer. By using graphic design terminology such as principles, elements, typography, and advertising styles, a designer can assure the client or audience that their design is effective and meets the needs that the client proposes.

10. Know the design process.

- Important to figure out you own individual way to design.

This item gained a consensus in the final round of the modified Delphi instrument. The panel suggests that it is vital for a designer to develop their own unique style and design process. The main comment in non-support of this item was that design does not have a concrete process and that each individual and agency operates differently. The researcher feels that this comment still supports the importance of a graphic design student creating their own unique design process because once that is established a graphic design student then can investigate agencies and markets where that individuals' abilities are most desired. This idea was expressed in comments of support for Item 6, in knowing who and where a design was created.

11. Understand layout design for printing and for Web.

- Important but very easy to pick up and understand.
- Knowing the limitations associated with print production and digital is essential to designing great work.
- These can be two separate disciplines (Web and Print).
- The Web is everything now. I believe that print is not dead, YET.
- Printers hate crappy files.

This item the panel suggests that layout for print and the Web is crucial knowledge to a graphic designer. A graphic design student needs a strong grasp on how to layout a specific design and what is the means on which it will be seen, printed substrate or on screen through the Web. Like the second bulleted comment expresses, knowing the limitations associated in print layout and Web layout is essential to design great work.

31. Learn how to conceptualize design that follows a strategy.

- Strategy may apply to page layout, ads but packaging, not really.
- Crucial. Hard to have a design w/o a strategy.

The panel believes that a strategy is essential to producing a design. Knowing where, to who, and how a design is intended to reach and defining those parameters is essential to producing effective high quality design. The whole purpose of design is to convey a message to an audience in order to compel a reaction and a strategy is the blue print for a design to do just that.

Items in the Formal Concepts group are: Items 3, 15, and 16. Items 3 and 15 were rated Important and Most important respectively. A summarization of comments in support of these items include the following:

3. Understand drawing techniques, including different mediums such as pencil, ink, and charcoal. Know how to sketch and draw to construct concept.
 - Good to not rely solely on the computer.
 - While it is not essential for gaining a career, the ability to communicate my ideas on mediums other than a computer screen is what has set me apart from most of my peers.
 - Drawing ability is the language of a graphic designer. A graphic designer needs to have the ability to communicate their ideas in a visual way....FAST.
 - The ability to draw HAS to be there or the designer is a mute when s/he tries to explain their idea/mental picture.
 - Still important, but not as much these days. Learn to think with a pencil. Build concepts up from sketching.

The panel feels that the skill of drawing a skill that is essential for a graphic designer because the main objective of a design is to convey a message visually. Often graphic design starts with

sketching of ideas and layout structure on paper to form a basis before moving to another medium.

15. Understand photo composition.

- Important for understanding what the different options in Photoshop are for. Photoshop is an essential program.
- Important but if someone understands composition in general, they should understand composition in photography.
- You can have an awesome layout and then the photo was poorly set up and it will change the whole look of an ad or layout.

The panel feels that understanding of photo composition is of importance because one of the main components to graphic design is images. These images need to be constructed well in order to convey the specific message or give the desired overall feeling in a design. Know how to construct photos and elements dealing with composition, allows the designer to determine if an image is right for a design.

16. Understand photography dark room techniques, traditional and digital.

- A crucial skill, as so many images are manipulated in the computer. To know why from basic photography techniques helps in getting to the desired solutions.
- Helps with Photoshop.
- I do not think you necessarily should be able to do it, but understand what can be done so it can be accomplished for your needs is important. Traditional techniques are not essential, but having an understanding of them would benefit the student.
- This is helpful, especially in regards to digital photography.

The panel feels that traditional dark room techniques are important to a designer to understand how elements and tools within Photoshop were created. One element of a graphic designers' job is image manipulation and retouching. Having this knowledge of photography techniques can benefit the graphic design student in making better image adjustments and manipulation.

Items in the Technology and Production group are: Items 12, 14, 18, 26, 37, and 39. All items except Item 18, were rated Important and Most important. Item 18 was rated Less Important to Important. A summarization of comments in support of these items include the following:

12. Knowledge of printing design software such as Adobe Photoshop, Illustrator, and InDesign and working with this software in combination with each other.

- Essential!

The panel feels this item is essential to a graphic designer. Adobe Photoshop, Illustrator, and InDesign are standards in the graphic design world for production. These pieces of software are essential tools for a graphic design student to learn and implement their uses and abilities.

14. Know file types (.jpg, .tif, .psd, .pdf, etc.), their operation, advantages, and disadvantages of each.

- Again, I believe knowledge of the different file types are important, but there are things that most students know from experience and are easy enough to learn about on their own.
- I still do not know as much as I wish I did about these things!

Knowledge of file types is essential to a graphic designer because often specific files are needed for output and transfer of a design. Knowing the advantages and disadvantages gives the designer the ability to create the appropriate file for every occasion and allows work to flow

without resistance.

18. Understand 3D animation software, such as Autodesk's 3Dstudio Max and Maya.

- Graphic design and 3D animation - 2 different disciplines in my book.
- 3D software is becoming very important in package design as a way to show a better representation of a product on shelf.
- If you choose to work in the animation field. Often this is a specialist.

The panel rated this item a median rating of 2 (Less Important). This is the only Item of consensus that received a rating of 2. The panel felt this more so then any other item, that 3D animation software was a specific niche in design and in the grand scheme of design education was not as essential as other items.

26. Know printing applications for various substrates and ink types.

- If you are designing for packaging, understanding limitations of various print methods on various substrates is critical.
- If you choose to work in the print field.
- ABSOLUTELY! Lot can be learned on job.

The panel feels this item is crucial to a graphic designer. If a design is to be printed, knowing what it is going to be printed on is crucial. Different substrates have different qualities that can affect how a design is displayed. An example of this is glossy or matte finish paper. Glossy gives a shine quality to design and produces vibrant color but glossy paper's disadvantage is that it can create unwanted reflections. Matte finish can give not as vibrant color but still quality color to a design without the reflection of glossy paper.

37. Learn CMS tools (Wordpress, Joomla, etc.) and how to design using them.

- This is getting more and more mainstream.

- Yes, I think this can be important if you want to design in a website medium, but this is related to Item 19 & 20.

CMS tools are becoming more prevalent in design because of their user friendliness. These systems are important to the Web and the designer because the designer can give control to a client when information changes with a company or new things need to be added to a website. CMS allows the designer to remove tedious hours off of their workload and focus on the big picture of their Web layout and design scheme.

39. Strong, effective production skills as well as design.

- Need to determine if what you created can actually be produced.
- This is a MUST have. So glad someone added this b/c it is essential to the success of as designer.

Participants rated items dealing with production skills and items dealing with formal design concepts similarly. Design and production skill items were rated Important and a majority were rated Most Important. Item 39, Strong, effective production skills as well as design, had a median rating of Most Important. This is worthy to note because it shows a consensus that formal design skills and production skills are of equal importance.

Items in the Professional World group are: Items 23, 24, 29, 32, 33, 40, and 42. All items were rated Important to Most important. A summarization of comments in support of these items includes the following:

23. Understand entrepreneurship with regards to the business aspects of freelancing.
- Important for freelancing but not the most important trait of a designer.
 - If you know how to operate your own freelance business you will never be out of work. It is also good training for a management position.

- Makes you much better in a team environment in corporate setting.
- Only if you plan to be a freelancer.
- Learn what to charge and Legal aspects.

In this study, a good number of the participants were freelance graphic designers. Learning aspects of running a business, gives the graphic design student vital knowledge in supporting himself or herself by allowing that person to keep working even if he or she is not in a corporate setting. An individual having to manage themselves and their own business gives valuable leadership skills that can be applied to a team scenario or creative department in a corporate setting.

24. Understand the operation of a graphic design company or organization.

- This is important because creative departments are much different than any other department in a company.
- This helps other departments work with us and get the best product possible.
- Its important to set up the organization correctly so that other departments know how you function, otherwise you turn into a production monkey and end up just doing what everyone says with or without a good reason.
- I find it helps to get an understanding of the company structure so as to get a better idea how each co-worker visualizes the creative work that is produced.
- Companies vary.
- Only if you are going to be on your own or run your own studio.

The creative department is different than any other in a corporate setting. Experiencing how one operates and seeing the workflow is beneficial for a graphic design student. Knowing the operation gives the student an easier transition from academic life to professional life allowing

the student better understanding of the field in which they are entering.

29. Know current trends in the graphic design field.

- Should be an ongoing thing.
- Do not be a slave to trends. Know who/what companies are producing this work.

Current trends are a vital piece of knowledge for the graphic designer. With the surge of mobile devices, understanding how a design can be made to fit any screen is becoming a growing responsibility for the graphic designer. Keeping current in a field that depends on new technology and software is vital for the graphic designer in order to work and produce work with minimal resistance and frustration.

32. Learn design as a solution to solving real world problems through an internship or class with actual clients, products, or accompany.

- I do not know why an unpaid internship would necessarily lead to poor jobs. Do not agree with that.
- Work alongside someone who knows what they are doing on your first jobs.
- Usually you always have a boss at first and they will be monitoring you especially since you are new to the field.
- I strongly encourage you to work at a company before going out on your own right out of school!
- Nothing like real world experience.
- Very Important.

Real world experience is invaluable to a graphic design student. Certain aspects of the job can only be learned through experience. Working alongside a professional through an internship can give a graphic design student insight on how the professional graphic design world is and

operates.

33. Understanding of culture, where it has been and where it is going.

- Especially with regards to Design History. You definitely want to explore this so that you know what you are getting into.

The graphic designer's main job is conveying a message visually to an audience. Knowing the culture of which you are designing for, lets that message make a smooth transition from the design to the audience. In other words, speaking the "language" of your audience is vital.

Item 40 only received one comment of its similarity to Item 23 and 28.

42. Learn about licensing of images, music, video, etc. for resources for design work.

- This comes on the job. You do not want to get you or your client in a legal dispute.
- Oh yeah, last thing you want is to get slapped with a lawsuit.

A graphic design student needs to understand the legal aspects of their work, especially when it comes to licensing of images. The graphic designer uses images as a main component of their designs and copyrighted images and licensed images are used especially with branding of identity design. Using logos appropriately and images lawfully prevent the graphic designer from a lawsuit and earning a bad reputation with their clients.

Items in the Self-promotion group are: Items 22 and 25. All items were rated Important to More Important. A summarization of comments in support of these items includes the following:

22. Know how to construct a book portfolio and digital portfolio.

- Your book sells you. It has to look great and speak for itself!
- Both are crucial even if everything is digital these days.
- Cannot get a job without one of the two, preferably both these days.

- More digital and PDF than book.

A portfolio is the first impression that is given by a graphic designer to a client or employer. The graphic design student needs to have a strong portfolio in order to gain respect and show their skills and value to their client or employer in order to receive work. The graphic designer is a salesperson in the respect that they sell themselves or their work.

25. Know uses of various Internet activities, such as social networking, for self-promotion.

- It really helps with regards to finding new employment.
- Networking always helps.
- You need social networking skills for companies as well!
- So popular these days, it would be great to know more.

Often college students are aware of social networking. A graphic design student needs to understand the usefulness of social networking for self-promotion through networking of colleagues and clients. This can lead to further work and builds a respectful reputation within the graphic design community.

Items in the Communication group are: Items 8, 9, 28, 34, 35, and 36. All items were rated More Important to Most Important. A summarization of comments in support of these items includes the following:

8. Develop the ability to problem solve.

- Yes, it can be learned, but if you are already good at it this sets you apart and may be the difference between being hired as a production artist or being hired as a director or manager.
- Important, but somewhat learned over time. Not necessarily in a classroom environment.
- Being a proactive problem solver is a skill that really helps you stand out from the crowd.

Solve the problem before it is even an issue.

The skill of a problem solver is to a degree what the graphic designer is. The graphic designer is solving, for clients, the problem of conveying a specific message to a specific audience in a visually pleasing way. The panel states that this skill is not just for a graphic design but for all aspects of life, an essential skill.

9. Develop the ability to work on a team as a team leader and team member.

- Team Member and team leader are two different things. I have worked in an environment where everyone wants to be the chief. That created conflict.
- I am a doer and I do it well and efficiently and if I have to I will put in the long hours to achieve the goals. That is not team leadership but essential skills nonetheless.
- This is helpful when working with others, but not always necessary.
- Though it is important to NOT have an ego when designing for a client, or when working in a large company. It is always a compromise.
- In a corporate setting, this is a key to success. Delegate tasks, set goals and meet them.

The panel felt that this skill set is vital to a corporate designer. Often graphic designers work in teams of an Account Executive, Creative Director, and Graphic Designer. Each of these individuals has a specific task in which to accomplish. Good communication is vital to the success of the team.

28. Know how to listen, write and speak effectively (good communication skills).

- Crucial in this field and in life.
- Most important to listen.

This item goes along with several of the items on the modified Delphi instrument. Good communication is essentially the job of a graphic designer. Understanding of how to

communicate effectively allows for smooth workflow of a corporation and relationships between designer and client. The graphic design student can use the skill set throughout his or her life, not just in terms of graphic design.

34. Learn how to give constructive input on design work.

- Usually you do not get to give much input, rather you get to listen a lot.
- Learn how to play well with others.
- Absolutely! If you do not like something, back it up with Why, not just that you do not like it. Not a good enough reason.

Criticism is a large part of the graphic designers' life. Understanding how to take in that criticism to produce excellent work will be the true test of a graphic designer through out their careers. The graphic designer needs to understand why a client or an aspect of their design is not liked or working in order to correct the mistake and produce effective design that meets the clients' needs.

35. Learn how to manage other designers/creatives.

- This is good if you plan on becoming a Creative Director. However, there is a different skill set between the type of personality that a creative director needs and one that a normal art director or graphic designer needs.
- This will certainly be important if your ultimate goal is to become a team manager.
- Hard to teach in school when money is not involved.

This skill set the panel that vital if a graphic design student wishes to one day be a team leader or Creative Director. In these jobs, a graphic designer would delegate tasks and over see work of lower tier graphic designers. Managing of others and delegating of tasks become a major part of a graphic designers' life if they wish to move higher in their career path in regards to a corporate

setting.

36. Know how to conceptualize with a copywriter to solve design problems.

- Usually when working on advertising projects, like print ads, TV spots, etc.
- Thinking in a team is vital to collaboration in the workplace.

Working with a copywriter is, at times, part of the job of a graphic designer. Working well with another person and having good communication between a graphic designer and a copywriter allows the message of a client to be conveyed in the manner of which the client wants.

Collaboration is always a key aspect of the graphic designers' life.

Non-Consensus Items Worthy of Note

There are some items the researcher, himself without 10 years of experience, thought worthy to include in the literature review that did not reach a consensus with the panel because of contrasting opinions. These items are 17, 20, and 21. Item 17 is “Know Web design software such as, Adobe Dreamweaver and Flash.” A summarization of comments in support of Item 17 is:

- I talked recently to many creative directors and art directors. They have all stated how the advertising and graphics industry is changing. They see the vast majority of work in the Web area rather than print. Industry is heading that way.
- Clients now want print and Web from the same designer.

A summarization of comments in non-support of Item 17 is:

- Find your niche and focus your skills on what you want to do best! It is HARD to stay away from the technical side of Web development. We are all designers first.
- Not in the world of packaging. As long as there are products, there will be packaging. They need graphics and they need to be printed. That is the reality of packaging and Web

is ancillary to it.

- Be a Web designer if you want to learn Dreamweaver and Flash. Graphic Designer is different than Web Designer.

It is interesting that a panel member from the packaging industry may not be in support of an item because his or her own field, packaging, does not need that skill. This is seen in the second bulleted item above. The reader should recall that the purpose of the modified Delphi study was to identify by consensus “What...graphic designers need to know and be able to do in order to succeed in the graphic design field now and in the future...” upon graduating from a graphic design program, not a packaging design program. The researcher went back through the data to see if a packaging designer on the panel may have indicated such opinions in other areas of the study, and he found it is plausible that this experts' perspective is that not all individuals pursuing a graphic design education, will be a general graphic designer, rather focus in a specific niche area. The researcher would like to express that students, while in their graphic design education, may or may not focus on one area or niche within graphic design. Item 20 is “Know Internet languages, such as HTML, CSS, and XML.” A summarization of comments in support of Item 20 is:

- Good to know what the programming can and cannot do so that you create designs that can translate over to the Web and be exactly as you designed them.
- Industry is heading towards this.

A summarization of comments in non-support of Item 20 is:

- However, not necessary to know how to code it yourself. (This comment relates to first comment in support of Item 20).
- Internet languages have zero bearing on packaging design.

- If you choose to work in this field. Often Web developers handle this.

It is interesting that some participants felt a graphic designer is a different profession than a Web designer, although many felt if one could not do both Web design and print design, an individual would be limiting himself or herself and his or her business. Participants expressed in the data collection process via email that the current need of a designer is to be both a print and Web designer. If a graphic designer is both, the designer has more value as a freelancer and in a corporate setting. Item 21 is “Know the printing processes of Lithography, Flexography, Gravure, Serigraphy (Screen Printing), and Digital.” A summarization of comments in support of Item 21 is:

- My specialty is package design, so that is why I rate it most important.
- It can be great design but, if it does not meet the requirements of the process in which it will be printed, it is useless. Even worse, the client was sold on a concept that cannot be produced.
- Know the limitations of each process.

The comment that is in non-support of Item 21 is:

- Only if you choose to work in this field.

It is of interest that even though there was non-consensus with this item on printing production processes, there was consensus on having good effective production skills (Item 39). Comments made for Item 39 were similar to Item 21, in that the overall opinion was no matter how good a design was, if it cannot be produced, it is useless.

CHAPTER 6

Recommendations

The following recommendations will be of interest to graphic designers, graphic design educators, technology educators, technology and graphic design administrators, and technology and graphic design students.

1. Infuse graphic design programs (including technical programs of a graphic arts nature) with selected instrument items based on importance.
2. Provide professional development in areas of the selected items, so educators can implement those items into their curricula.
3. Use the findings to further enhance graphic design and technological programs.
4. Provide students a "map" on which items they should focus on in order to become a successful graphic designer.

Implementation of Selected Knowledge/Skill Sets into Graphic Design and Technology Education

Implementation of items based on importance found by this study can be accomplished through various techniques. These suggested techniques can be useful to educators in graphic design related classes. It is important for the reader to know that implementation of items is not limited to these techniques. Items rated with an IQR of 0 and had a median rating of Most Important can be implemented through constant reinforcement of knowledge/skill sets. The principles of design can be implemented in a curriculum by introducing students to the principles of design and then reinforcing them through projects and in critique sessions throughout the students' graphic design education. With regards to Item 8, Develop the ability to problem solve, by giving students design problems to solve outside of a textbook or step-by-step

instructions, develop the ability of student to problem solve on their own. Students learn to use all their resources, pulling from various sources in order to solve problems. This develops independent thinking, which is essential in the workplace. Cross (2004) states in his study that the difference between experts and novices in design is experts use all of their resources pulling from different fields and knowledge to solve problems.

Item 12, knowledge of printing design software such as Adobe Photoshop, Illustrator, and InDesign and working with the different software in combination with each other, this item can be implemented through constant use throughout a students graphic design education. These programs are tools like any other tool such as a paintbrush or pencil, to produce design work in a professional environment. With regards to Item 28, know how to listen, write and speak effectively (good communication skills), this item can be implemented through the use of critiques on every project. Critiques allow students to develop presentation skills in order to describe their work or process in which they used to solve design problems. This process also allows the student to listen to constructive criticism and allow an educational environment where passing and failing is not as much as an issue as learning. Critiques also allow the student to learn good public speaking skills and how to address different speaking environments. With regards to Item 40, understand client needs, and deliver on time; this item can be implemented through specific projects and firm deadlines. Projects with regards to this item can be scenarios in which students receive instructions based on make-believe clients. The instructor can act as the client to give instruction and criticism like a real world scenario. Delivery on time can easily be accomplished through strict deadlines on projects with extremely little flexibility.

Items rated with an IQR of 1 and had a median rating of Most Important can be implemented through constant reinforcement of knowledge/skill sets. The elements of design

can be implemented in a curriculum by introducing students to the elements of design and then reinforcing them through projects and in critique sessions. It is important to add that the principles and elements of design should be introduced early and often in the career of a student. With regards to Item 5, know the history and the applications of typography, this can be achieved by having a class devoted to typography where formal typography and digital typography are discussed and applied. Item 7, Differentiate high quality design from poor quality design, can be accomplished by giving examples of high quality design and poor quality design. Class discussion is extremely useful on understanding why designs "work" and why they do not. Item 9, Develop the ability to work on a team as a team leader and team member, can be achieved through assignment of group projects. Group projects build team skills and allow students to learn different phases of a project and the duties those phases entail. It is worthy to note that many accreditation committees often ask institutions if their students are working in teams/groups and presenting in front of an audience. Item 10, know the design process, can be implemented by giving examples of different types of workflow. This can also be implemented by giving real world experience discussions from the instructor or professional graphic designers. With regards to Item 11, understand layout design for printing and for Web, this can be implemented by designing a class that addresses layout specifically. Projects can be given that address different design layouts such as periodicals, packaging, brochures, tabletops, posters, folders, and other promotional materials. A separate class can address Web layout. Item 14, know file types (.jpg, .tif, .psd, .pdf, etc.), their operation, advantages, and disadvantages of each, can be addressed simply by reading the advantages and disadvantages in a textbook such as Johansson's, Lundberg's, and Ryberg's (2007) book, *A Guide to Graphic Print Production*, and then working with different file types on projects. Item 15, Understand photo composition, can

be implemented by having a course in photography. In this course composition and elements of a photograph can be discussed to create understanding of good photography. After all, images are a main component of graphic design along with typography.

Item 22, know how to construct a book portfolio and digital portfolio, can be addressed in a senior seminar class. In this class, students can gather work they have done through their college career and address needs of creating their portfolio. This class can also address building a personal website for an electronic portfolio since this is becoming more of a way employers use to see an individuals' work. Item 31, learn how to conceptualize design that follows a strategy, can be accomplished with various projects that require research on the students part to come up with a theme and strategy for a product. Research is invaluable to the designer and often easier to do when in school because of the resources made available to the student. Item 32, Learn design as a solution to solving real world problems, through an internship or class with actual clients, products, or accompany, can be accomplished by designing a senior level class like it was a design agency. By giving students roles like, account executive, creative director, art director, production artist, students can learn the real world environment of a design agency by carrying out projects. This can be improved by having actual clients, perhaps form campus organizations, that require design and production work for various events and programs. Item 34, learn how to give constructive input on design work, can be addressed in formal critiques after each project. These critiques teach students to think on their feet and address criticism in a professional manner. Item 36, know how to conceptualize with a copywriter to solve design problems, can be addressed by creating projects in pairs where one student acts as a copywriter and one the designer for a product advertisement. Item 39, strong, effective production skills as well as design, can be implemented by designing several classes in production types. These

classes can emphasize the necessity for both high quality design and production, not just one or the other. Items rated with an IQR of 1 and had a median rating of More Important can be implemented through semi-constant reinforcement of knowledge/skill sets. Item 3, understand drawing techniques, including different mediums such as pencil, ink, charcoal and know how to sketch and draw to construct concept, can be implemented by having a designated class in drawing concepts or requiring sketches as a preliminary step to all projects. This will enhance drawing skills and teach students to establish thoughts before going to the screen or production without adequate brainstorming and research. Item 6, know advertising and marketing; types, styles, etc., can be addressed in curriculum by discussing different types and styles in classes and possibly also in a senior seminar class. Discussing these different types and then requiring projects of that certain style or type can reinforce this knowledge. Item 23, understand entrepreneurship with regards to the business aspects of freelancing, Item 24, understand the operation of a graphic design company or organization, and Item 42, learn about licensing of images, music, video, etc. for resources for design work, can all be addressed in a class designed primarily for the graphic design business aspect. This class can address these topics and open a discussion like environment for how to implement and run a graphic design company and handle the trials of being a freelance graphic designer. Item 29, know current trends in the graphic design field, and Item 33, understanding of culture, where it has been and where it is going, can be addressed in a senior seminar class or a standalone class where research on topics that are currently going on in graphic design world is the main objective. This can give students invaluable knowledge and understanding of what it is to be a successful graphic designer.

Item 35, learn how to manage other designers/creatives, can be implemented by having group projects in classes where an individual assumes a leadership role as a creative director and other designers are managed by that individual.

Items rated with an IQR of 1 and had a median rating of Important can be implemented through semi-constant reinforcement of knowledge/skill sets. Item 4, understand graphic design history in regards to the evolution of the field in graphic design styles and graphic design technology, can be addressed by having a class designed solely on graphic design history where styles and technology are discussed. Item 16, understand photography dark room techniques, traditional and digital, can be addressed in a formal photography class that discusses traditional and digital photography. This can be the same class where photo composition is discussed. This class can show students the traditional dark room techniques that led to a lot of Adobe's Photoshop innovations. Item 25, know uses of various Internet activities, such as social networking, for self promotion, this subject is one that students have a good grasp on, when it comes to social networking. The topic that needs to be addressed is networking in a professional manner. This topic can also be addressed in the graphic design business class where Item 23, 24, and 42 are discussed and implemented. Item 26, know printing applications for various substrates and ink types, can be implemented by having a designed class in substrates and inks that addresses this topic. Item 37, learn Content Management Systems (CMS) tools (Wordpress, Joomla, etc.) and how to design using them, can be addressed in a Web design class. The researcher felt it was worthy to mention, while Item 20, know Internet languages, such as HTML, CSS, and XML, did not reach a consensus, this knowledge is essential to the understanding of CMS tools and should be addressed to fully comprehend this skill set.

Items rated with an IQR of 1 and had a median rating of Less Important can be implemented through minimal reinforcement of knowledge/skill sets. Item 8, understand 3D animation software, such as Autodesk's 3Dstudio Max and Maya, can be addressed in a 3D design class where this software is used to create solid models or animation.

CHAPTER 7

Conclusion and Further Research

The field of graphic design has become a very broad spectrum. Graphic designers today need to possess a wide variety of skill sets in order to adequately perform their duties. The skill sets include areas of study in Design, Formal Concepts, Technology and Production, Professional World, Self-promotion, and Communication. This study identified those essential skill sets/knowledge in graphic design in order to implement those topics into graphic design curriculum. As graphic design is ever changing, so to must the education that accompanies graphic design. By addressing new and current topics of interest and essentialness, the graphic design student is better prepared for the graphic design profession. The success of a graphic designer is determined by a strong base foundation of knowledge and skills acquired through their post-secondary institution, as this is the place that the majority of individuals attain skills for their future career. Many of the participants of the study addressed in the comments and emails of the study that the graphic design field is changing by the day, and the graphic designers' obligations are changing. They also said that graphic designers need to be better prepared for the profession in which they are entering because of the fast paced life of a graphic designer.

Further Research

Further research is being planned by the researcher to address different demographics during a graphic designers' career. This study asked qualified experts in graphic design to identify the essential knowledge/skill sets in graphic design. The researcher would like to further the research by addressing individuals that are new or less than 10 years experience in graphic design to the same instrument. The researcher would like to use a similar instrument for graphic

design instructors to rate the importance of knowledge and skill sets they see fit for a graphic designer. The researcher would also like to survey higher level students that are currently in a graphic design program about topics they find essential to their future success in graphic design or most interesting to learn while they were in their field of study. After addressing these three demographics, the researcher will look to see what consensus exists between the three groups. The rationale to this further research is to give a better understanding of the graphic design field and what skills are most important to graphic design students and professionals alike.

Throughout the modified Delphi study, comments on survey items and in email correspondence gave the impression of some participants were steadfast in their ways and opinions on the importance of knowledge/skill sets. Some participants asked the question, "why do I need to change my rating to the majority?" The comment was also made "why would I want to jump on the bandwagon of a current trend?" The researcher had to avoid these questions as to not lead participants in a direction to avoid bias. The researcher sees an importance and an interest in discovering a correlation between these demographics, if it exists, that can further benefit the field of graphic design and graphic design education.

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Appendix A

Round 1, 2, and 3 Analysis

Item #	Skill Set/Knowledge	Round 3			Round 2			Round 1		
		IQR	Mdn	SD	IQR	Mdn	SD	IQR	Mdn	SD
1*	Understand the elements of graphic design; line, shape, direction, size, texture, color, and value.	1	5	.577	1	5	.577	1	5	.744
2*	Understand the principles of graphic design; balance, gradation, repetition, contrast, harmony, dominance, and unity.	0	5	.424	0	5	.712	0	5	.780
3*	Understand drawing techniques, including different mediums such as pencil, ink, and charcoal. Know how to draw to construct concept.	1	4	.801	1	3	.892	1	3	1.07
4*	Understand graphic design history in regards to the evolution of the field in graphic design styles and graphic design technology.	1	3	.934	2	3	1.01	1.75	3	1
5*	Know the history and the applications of typography.	1	5	.580	1	5	.580	1	5	.826
6*	Know Advertising and Marketing; types styles, etc	1	4	.730	2	4	.759	1.75	4	.766
7*	Differentiate high quality design from poor quality design.	1	5	.694	1	5	.694	1	5	.838
8*	Develop the ability to problem solve	0	5	.424	0	5	.456	0	5	.476
9*	Develop the ability to work on a team as a team leader and team member.	1	5	.700	1	5	.839	1	5	.832
10*	Know the design process.	1	5	.888	2	5	1.02	1	5	.916
11*	Understand layout design for printing and for Web.	1	5	.480	1	5	.572	1	5	.567
12*	Knowledge of printing design software such as Adobe Photoshop, Illustrator, and InDesign and working with this software in combination with each other.	0	5	.424	1	5	.447	0	5	.418
13	Know how to transition colors from computer monitor (screen) to print media.	2	4	.907	2	4	.907	1.75	4.5	.917
14*	Know file types (.jpg, .tif, .psd, .pdf, etc.), their operation, advantages, and disadvantages of each.	1	5	.742	1	5	.784	1	4.5	.810

15*	Understand photo composition.	1	5	.698	1	5	.694	1	4	.772
16*	Understand photography dark room techniques, traditional and digital.	1	3	.629	1	3	.629	1	3	.863
17	Know Web design software such as, Adobe Dreamweaver and Flash.	2	3	1.15	2	4	1.28	2	3	1.29
18*	Understand 3D animation software, such as Autodesk's 3Dstudio Max and Maya.	1	2	.802	1	2	.892	1	2	1.07
19	Know computer program languages, such as C++, PHP, and JavaScript.	2	2	.892	2	2	1	1.75	2	1.29
20	Know Internet languages, such as HTML, CSS, and XML.	2	3	1.14	2	3	1.32	2.75	3	1.46
21	Know the printing process of Lithography, Flexography, Gravure, Serigraphy (Screen Printing), and Digital.	2	3	1.02	2	3	1.01	1.75	3	1.18
22*	Know how to construct a book portfolio and digital portfolio	1	5	.577	1	5	.577	1	5	.937
23*	Understand entrepreneurship with regards to the business aspects of freelancing.	1	4	.555	1	4	.656	1	4	.756
24*	Understand the operation of a graphic design company or organization.	1	4	.742	1	4	.847	1	4	.928
25*	Know uses of various Internet activities, such as social networking, for self-promotion.	1	3	.751	1	3	.797	1	3.5	.911
26*	Know printing applications for various substrates and ink types.	1	3	.753	1	3	.953	1.75	3	1.06
27	Understand the use of sustainable resources in the field of graphic design.	2	3	.898	2	3	.898	1.75	3	1.01
28*	Know how to listen, write and speak effectively (good communication skills).	0	5	.192	0	5	4.24	1	5	.629
29*	Know current trends in the graphic design field	1	4	.786	2	4	.834	1.75	4	.819
30	Know planning, estimating, and scheduling	2	4	.980	2	4	.974	2	4	1.06
31*	Learn how to conceptualize design that follows a strategy	1	5	.577	1	5	.577	1	5	.693
32*	Learn design as a solution to solving real world problems Through an internship or class with actual clients, products, or a company.	1	5	.506	1	5	.580	1	5	.737

33*	Understanding of culture, where it's been and where it's going.	1	4	.724	1	4	.860	-	-	-
34*	Learn how to give constructive input on design work	1	5	.447	1	5	.542	-	-	-
35*	Learn how to manage other designers/creatives	1	4	.934	1	4	.962	-	-	-
36*	Know how to conceptualize with a copywriter to solve design problems	1	5	.961	1	4.5	1.12	-	-	-
37*	Learn CMS tools (Wordpress, Joomla, etc.) and how to design using them	1	3	.912	1	3	1.03	-	-	-
38	Design Iphone and related apps	2	3	1.09	2	3	1.19	-	-	-
39*	Strong, effective production skills as well as design	1	5	.506	1	5	.694	-	-	-
40*	Understand client needs, and deliver on time.	0	5	.192	0	5	.526	-	-	-
41	Cross platform knowledge work with Mac and PC	2	3	1.04	2	3	1.04	-	-	-
42*	Learn about licensing of images, music, video, etc. for resources for design work.	1	4	.620	1	4	.786	-	-	-
43	Understand how to effectively keep financial records and budget expenses.	2	4	.980	2	4	1.13	-	-	-

* Indicates a consensus

Appendix B

Comments from Round 1, 2, and 3 Instruments

Item#	Skill Set/Knowledge	Round 1, 2, and 3 Comments
1*	Understand the elements of graphic design; line, shape, direction, size, texture, color, and value.	Summarization of Comments: While it is no doubt important and necessary to have a strong base of understanding, these skills are not any more important than others, i.e. time management, working with a team, pricing your work, etc. This is core knowledge that many seem to forget these days, using the computer as a crutch rather than a tool to implement the above. Color theory is very important—it's good to have when backing up a proposed color scheme
2*	Understand the principles of graphic design; balance, gradation, repetition, contrast, harmony, dominance, and unity.	Summarization of comments: Also, as you become more experienced and view a lot of great work (and compare yours to it), you will absorb this. It may however be helpful to learn some terminology for when you are explaining or defending your work. Critical knowledge. Same as above.
3*	Understand drawing techniques, including different mediums such as pencil, ink, and charcoal. Know how to sketch and draw to construct concept.	Summarization of Comments: good to not rely solely on the computer. While it is not essential for gaining a career, the ability to communicate my ideas on mediums other than a computer screen is what has set me apart from most of my peers. Drawing ability is the language of a graphic designer. A graphic designer needs to have the ability to communicate their ideas in a visual way...FAST. The ability to draw HAS to be there or the designer is a mute when s/he tries to explain their idea/mental picture. Still important, but not as much these days. Learn to think with a pencil. Build concepts up from sketching.
4*	Understand graphic design history in regards to the evolution of the field in graphic design styles and graphic design technology.	History is always good to know. At the end of the day, no client cares. They just want what is in current style, and what makes their company look like it's on the competing edge. It is only of moderate importance in the day-to-day operations of a graphic designer. This is important when socializing within the Design community and becoming accepted and respected within said community, but honestly most clients could care less whether you know this stuff or not. Important to become a more complete designer.
5*	Know the history and the applications of typography.	Summarization of Comments: Everyone should watch the documentary Helvetica. Typography is vital. Maybe not the history as much as the application, the new applications allow for so many bad habits.
6*	Know Advertising and Marketing; types styles, etc	You need to know about different types of advertising and marketing. Your designs will change depending where it is going to be used. Example: a B2B environment vs. a B2C environment. A lot of this can be learned on the job. It will be important to distinguish the differences between various types of agencies/marketing firms to determine the best fit for yourself. Know the name of the agency too. Do not just like a commercial or a print ad. Know who did it. Then figure out how they agency got the client to agree to it. Not crucial information although helpful. You have to know the terminology.
7*	Differentiate high quality design from poor quality design.	This IS totally subjective. Who's to say what is high quality and what is not? What's important is the message and that it not get lost in "Great" design. A simple design will not create this distraction. This is totally subjective. If the graphic designer cannot do their work will be the poor quality design. Promise. If you cannot identify high quality design then you sure are going to have a hard time consistently producing it! Or be able to convey in words (to a client, etc.) what constitutes an effective design and why it works. Again, you have to be able to back up your designs.
8*	Develop the ability to problem solve	Yes, it can be learned, but if you are already good at it this sets you apart and may be the difference between being hired as a production artist or being hired as a director or manager. Important, but somewhat learned over time. Not necessarily in a classroom environment. Being a proactive problem solver is a skill that really helps you stand out from the crowd. Solve the problem before it's even an issue

9*	Develop the ability to work on a team as a team leader and team member.	Team Member and team leader are two different things. I've worked in an environment where everyone wants to be the chief. That created conflict. I'm a doer and I do it well and efficiently and if I have to I'll put in the long hours to achieve the goals. That's not team leadership but essential skills nonetheless. This is helpful when working with others, but not always necessary. Though it's important to NOT have an ego when designing for a client, or when working in a large company. It's always a compromise. In a corporate setting, this is a key to success. Delegate tasks, set goals and meet them.
10*	Know the design process.	Summarization of Comments: People need to find their own way of designing. One way is not better than another if the end result is still great. Design is not an assembly line process. Design processes can vary from agency to agency. Design does not have a process. Design process is very individual.
11*	Understand layout design for printing and for Web.	Important but very easy to pick up and understand. Knowing the limitations associated with print production and digital is essential to designing great work. These can be two separate disciplines. The Web is everything now. I believe that print is not dead, YET. Not same soft or principals as design for print, typically a different corporate group with in an agency. Printers hate crappy files.
12*	Knowledge of printing design software such as Adobe Photoshop, Illustrator, and InDesign and working with this software in combination with each other.	Summarization of Comments: ESSENTIAL!
13	Know how to transition colors from computer monitor (screen) to print media.	This skill is usually learned on the job in the print field. In the grand scheme of design education, this is, to me, less important than learning about design. If you choose to work in the print field can be learned on the job. Computer monitor color gamut is significantly higher than the color gamut of ink on paper - it will always look prettier on the monitor. Set proper expectations early on. And to online. Not as important with the decline in print media. Often this is a color management staff member's only job.
14*	Know file types (.jpg, .tif, .psd, .pdf, etc.), their operation, advantages, and disadvantages of each.	Again, I believe knowledge of the different file types are important, but there are things that most students know from experience and are easy enough to learn about on their own. I still do not know as much as I wish I did about these things!
15*	Understand photo composition.	This coincides with the darkroom knowledge. Important for understanding what the different options in Photoshop are for. Photoshop is an essential program. Important but if someone understands composition in general; they should understand composition in photography. Helps with Photoshop and general composition needs. You can have an awesome layout and then the photo looks like crap or was poorly set up and it will change the whole look of an ad or layout.
16*	Understand photography dark room techniques, traditional and digital.	A crucial skill, as so many images are manipulated in the computer. To know why from basic photography techniques helps in getting to the desired solutions. Helps with Photoshop. I do not think you necessarily should be able to do it, but understand what can be done so it can be accomplished for your needs is important. This is helpful, especially in regards to digital photography. Traditional techniques are not essential, but having an understanding of them would benefit the student.

17	Know Web design software such as, Adobe Dreamweaver and Flash.	Summarization of Comments: Find your niche and focus your skills on what you want to do best! It's HARD to stay away from the technical side of Web development. We are all designers first. Not in the world of packaging. As long as there are products, there will be packaging. They need graphics and they need to be printed. That is the reality of packaging and Web is ancillary to it. Be a Web designer if you want to learn Dreamweaver and Flash. I talked recently to many creative directors and art directors. They have all stated how the advertising and graphics industry is changing. They see the vast majority of work in the Web area rather than print. Industry is heading that way. Graphic Designer is different then Web Designer. Two Different jobs. Clients now want print and Web from the same designer.
18*	Understand 3D animation software, such as Autodesk's 3Dstudio Max and Maya.	Summarization of Comments: Least important to my area of expertise. Graphic design and 3D animation - 2 different disciplines in my book. 3D software is becoming very important in package design as a way to show a better representation of a product on shelf. If you choose to work in the animation field. Often this is a specialist.
19	Know computer program languages, such as C++, PHP, and JavaScript.	Summarization of Comments: Very important if you want to design in a Web based medium. C++ is not as important in my opinion, but PHP and JavaScript are very important if you want to succeed in Web design. Industry is heading that way. Java is more helpful to the designer. Depends on what you get into. Web developers usually handle this.
20	Know Internet languages, such as HTML, CSS, and XML.	Summarization of Comments: Good to know what the programming can and cannot do so that you create designs that can translate over to the Web and be exactly as you designed them. However, not necessary to know how to code it yourself. There's programming geeks for that. Internet languages have zero bearing on packaging design. Industry is heading towards this. If you choose to work in this field. Often Web developers handle this.
21	Know the printing process of Lithography, Flexography, Gravure, Serigraphy (Screen Printing), and Digital.	My specialty is package design, so that is why I rate it most important. It can be great design but, if it does not meet the requirements of the process in which it will be printed, it is useless. Even worse, the client was sold on a concept that cannot be produced. If you choose to work in this field. <u>Vital to Packaging. Know the limitations of each process.</u>
22*	Know how to construct a book portfolio and digital portfolio	Summarization of Comments: Your book sells you. It has to look great and speak for itself! Both are crucial even if everything is digital these days. Cannot get a job without one of the two, preferably both these days. More digital and PDF than book.
23*	Understand entrepreneurship with regards to the business aspects of freelancing.	Summarization of Comments: Important for freelancing but not the most important trait of a designer. If you know how to operate your own freelance business you will never be out of work. It is also good training for a management position. Makes you much better in a team environment in corporate setting. Only if you plan to be a freelancer. Learn what to charge and Legal aspects.
24•	Understand the operation of a graphic design company or organization.	This is important because creative departments are much different than any other department in a company. This helps other departments work with us and get the best product possible. Its important to set up the organization correctly so that other departments know how you function, otherwise you turn into a production monkey and end up just doing what everyone says with or without a good reason. I find it helps to get an understanding of the company structure so as to get a better idea how each co- worker visualizes the creative work that is produced. Companies vary. Only if you are going to be on your own or run your own studio.
25•	Know uses of various Internet activities, such as social networking, for self-promotion.	Summarization of Comments: It really helps with regards to finding new employment. Networking always helps. Too many people are great at blowing time on face book and twitter but are short on actual social skills face to face. You need social networking skills for companies as well! So popular these days, it would be great to know more. Depends on what you are trying to accomplish.

26*	Know printing applications for various substrates and ink types.	Summarization of Comments: Not really correct. If you work in a print shop, you are running what they give you on what they tell you to print on. If you are designing for packaging, understanding limitations of various print methods on various substrates is critical. If you choose to work in the print field. ABSOLUTELY! Lot can be learned on job. And only if you work in a print shop.
27	Understand the use of sustainable resources in the field of graphic design.	Summarization of Comments: Clients could care less. They want what's cheapest and what looks nicest. Unfortunately that's not the recycled papers. Important, but kind of a bonus. A lifestyle choice, in a company a designer might not have say so. Personally important thing.
28*	Know how to listen, write and speak effectively (good communication skills).	Summarization of Comments: Crucial in this field and in life. Most important to Listen.
29*	Know current trends in the graphic design field	Summarization of Comments: Should be an ongoing thing. Do not be a slave to trends. Know who/what companies are producing this work.
30	Know planning, estimating, and scheduling	Summarization of Comments: Summation does not equate to majority rating. Time management is important. You MUST hit the deadline and plan for the unexpected. But, that was not the parameters of the stated skill set. Not as much if working for a company. Time management is key. Good to have general idea.
31*	Learn how to conceptualize design that follows a strategy	Summarization of Comments: Strategy may apply to page layout, ads but packaging, not really. Crucial. Hard to have a design w/o a strategy
32*	Learn design as a solution to solving real world problems Through an internship or class with actual clients, products, or accompany.	Summarization of Comments: I do not know why an unpaid internship would necessarily lead to poor jobs. Do not agree with that. Work along side someone who knows what they are doing on your first jobs. Usually you always have a boss at first and they will be monitoring you especially since you are new to the field. I strongly encourage you to work at a company before going out on your own right out of school! Nothing like real world experience. Unpaid internships lead to poor jobs. Taking on actual clients before you know what you are doing is a way to build a bad reputation. Very Important.
33*	Understanding of culture, where it's been and where it's going.	Especially with regards to Design History. You definitely want to explore this so that you know what you are getting into.
34*	Learn how to give constructive input on design work	Usually you do not get to give much input; rather you get to listen a lot. Learn how to play well with others. Absolutely! If you do not like something, back it up with Why, not just that you do not like it. Not a good enough reason.
35*	Learn how to manage other designers/creatives	Summarization: This is good if you plan on becoming a Creative Director. However, there is a different skill set between the type of personality that a creative director needs and one that a normal art director or graphic designer needs. This will certainly be important if your ultimate goal is to become a team manager. Hard to teach in school when money is not involved.
36*	Know how to conceptualize with a copywriter to solve design problems	Usually when working on advertising projects, like print ads, TV spots, etc. This is a combination of Item 8 and 31. Does not really need to be here. Thinking in a team is vital to collaboration in the workplace
37*	Learn CMS tools (Wordpress, Joomla, etc.) and how to design using them	This is getting more and more mainstream. Yes, I think this can be important if you want to design in a website medium, but this is related to Item 19 & 20. These are NOT industry standard design software apps.
38	Design Iphone and related apps	Very important. If mobile design is your interest.
39*	Strong, effective production skills as well as design	Summarization: Need to determine if what you created can actually be produced. This is a MUST have. So glad someone added this b/c it is essential to the success of a designer.
40*	Understand client needs, and deliver on time.	This goes along with Item 23 and 28
41	Cross platform knowledge work with Mac and PC	More for Web design

42*	Learn about licensing of images, music, video, etc. for resources for design work.	This comes on the job. You do not want to get you or your client in a legal dispute. Oh yeah, last thing you want is to get slapped with a lawsuit.
43	Understand how to effectively keep financial records and budget expenses.	Always good to know, especially if you freelance. Important so you can be successful. This coincides with Items 23, 24 & 30. If you are freelancing or managing a department. Yes. I do not think that this survey applies to those.

* Indicates consensus

No Items were dropped due to a lack of consensus or a low rating.

Appendix C

Modified Delphi Instrument Round 1

Essential Learning Objectives of a Graphic Designer,
Post-Secondary

Modified Delphi Study: Round 1

Thank you for agreeing to participate in this important study on the essential skill set within graphic design. The purpose of Round I of this Modified Delphi Study is to identify the skill sets or knowledge that are essential to become a successful graphic designer.

You are being asked to identify those graphic design skill sets/knowledge that students who study graphic design or related field in a post secondary institution should gain prior to graduation. Please consider the task in terms of identifying essential skill sets or knowledge not specific classes.

You may complete this instrument by saving the attached PDF file and complete the instrument as a document on your computer. If you complete the attachment, please save the file and attach it to a return email.

Before you begin the Delphi process, please read and complete the informed consent form in the next section. Then you will be asked to briefly answer some qualifying questions. Once you complete these first two sections, you may proceed to the Delphi-Round 1 instrument. The whole process should take about 45 minutes to complete. You are encouraged to make comments and suggestions for this instrument.

**Please return this Round 1 instrument by November 8th, 2011 to
wjoshuaweaver@gmail.com**

Thank you in advance for your participation in this Modified Delphi Study.

INFORMED CONSENT FORM

Study Title: Essential Learning Objectives of a Graphic Designer,
Post-Secondary

You have been asked to participate as a subject in a research project that involves the essential learning objectives of a graphic designer, post-secondary. Research is a study that is done to answer a question. Please take your time to make your decision and ask the person presenting you with this form to explain any words or information that you do not understand

PURPOSE

The purpose of this research is to identify what learning objectives or skill sets are essential for a person to become a successful graphic designer now and in the future.

SOURCE OF FUNDING

This project is under the direction of Joshua Weaver, a graduate student of North Carolina A&T State University. There is no funding for this study. The sponsor is not providing money or other support to North Carolina A&T State University to help conduct this study. The researchers do not hold a direct financial interest in the sponsor.

PROCEDURES

If you choose to participate in the project, you will be asked to participate in three rounds of a modified Delphi Study. You will be asked to rate 30 items on a 5-point Likert scale on the level of importance of skill sets or knowledge within the field of graphic design. Each round will take no more than an hour to complete. After each round comments and suggestions will be considered and majority scores will be determined. Round two and three will consist of the original study item plus items added and majority scores. Participants will then be asked to change or leave their rating to match the majority and explain why or why not they are choosing to match the majority.

RISKS AND BENEFITS

Your participation in the project will involve minimal risk. Foreseeable risks in participating in this study include time spent.

COSTS TO STUDY PARTICIPANTS

There are no costs to you while participating in this study other than your time.

COMPENSATION

You will not be paid for participating in this study

CONFIDENTIALITY AND DISCLOSURE

Efforts, such as coding research records, keeping research records secure and allowing only authorized people to have access to research records, will be made to keep your information safe. A report of general and combined results from several participants in this project will be prepared for the School of Technology at North Carolina A & T State University, and may be submitted to a professional publication or conference at a later time.

Results of this experiment will not be provided for you.

QUESTION ABOUT THE STUDY

The investigator, Joshua Weaver, is available to answer any questions that you have about your involvement in this project. Please contact Joshua Weaver at 336-209-4078 or by email, wjoshuaweaver@gmail.com. You may also contact my advisor, Dr. Vincent Childress at 336-334-7550 or by email at childres@ncat.edu.

WHAT HAPPENS IN CASE OF INJURY OR ILLNESS

This study involves minimal risk for injury. Therefore, there is no compensation for injury.

RIGHTS AS A RESEARCH PARTICIPANT

Your participation is voluntary. You may end your participation at any time. Refusing to participate or leaving the study at a later time will not result in any penalty or loss of benefits to which you are entitled. If you decide to stop participating in the study we encourage you to talk to the experimenter or study staff first.

The investigators also have the right to stop your participation in the study at any time. Reasons the experimenter may stop your participation in this study will be due to lack of participation in a timely manner.

If you have a question about your rights as a research participant, you should contact the Compliance Office at (336) 334-7995.

You will be given a copy of this form.

By beginning the modified Delphi Study, you acknowledge that you have read this information and agree to participate in this research, with the knowledge that you are free to withdraw your participation at any time without penalty.

Qualification Questions

DIRECTIONS: Please key in the requested information beside each item below.

1. What is your current title and place of business?

2. How many years of professional graphic design experience do you have?

3. What is the title of your degree and from what institution did you receive your degree?

4. Are you currently or have you been a freelance designer or corporate designer or both?

Please move on to the next section: Delphi Study – Round 1

Essential Learning Objectives of a Graphic Designer, Post-Secondary

Delphi Study: Round 1

Context:

Thank you for agreeing to participate in this important study on the essential skill set within graphic design. The purpose of Round I of this Modified Delphi Study is to identify the skill sets or knowledge that are essential to become a successful graphic designer.

You are being asked to identify those graphic design skill sets/knowledge that students who study graphic design or related field in a post secondary institution should gain prior to graduation. Please consider the task in terms of identifying essential skill sets or knowledge not specific classes.

Instructions:

In Round 1 of this Delphi Study, you are being provided a list of graphic design skill sets/knowledge for students in a post-secondary institution as recommended in the scholarly literature

Please return this Round 1 instrument by November 8th, 2011 to wjoshuaweaver@gmail.com

Thank you in advance for your participation in this Delphi Study.

To complete this first round of the study:

- Please rate the statements below based on the scale on the right side of the page. A rating of 1 indicates that the item is least important, and a rating of 5 indicates that the item is most important. **Select only ONE rating by checking the check box beneath the appropriate rating.** For example, in the following chart the participant has indicated a rating of 3.

	Regarding essential graphic design skill sets/knowledge, the post-secondary student will:	Least Important	Less Important	Important	More Important	Most Important
Example	Develop the ability to work in a team	1	2	3	4	5
				X		

- Reword the item statement only if you believe that it needs rewording. You can key in the rewording in the space below each item.
- Add outcome items/statements that you believe should be included but which do not appear in the list. You can add items at the end of the list. Please also rate each new item in terms of its importance.
- Comments are important to clarifying and improving on a study. **Comments are strongly encouraged.**

Explanation of ratings:

1. **Least Important:** Not necessary for a graphic design curriculum.
2. **Less Important:** Less than necessary for a graphic design curriculum.
3. **Important:** Necessary for inclusion in a graphic design curriculum.
4. **More Important:** Essential for inclusion in a graphic design curriculum.
5. **Most Important:** Most essential for inclusion in a graphic design curriculum.

Item	<u>Skill set/Knowledge</u>	Rating Scale				
	Regarding essential graphic design skill sets/knowledge, the post-secondary student will:	Least Important	Less Important	Important	More Important	Most Important
1	Understand the elements of graphic design; line, shape, direction, size, texture, color, and value.	1	2	3	4	5
Comments/reordering						
2	Understand the principles of graphic design; balance, gradation, repetition, contrast, harmony, dominance, and unity.	1	2	3	4	5
Comments/reordering						
3	Understand drawing techniques, including different mediums such as pencil, ink, and charcoal.	1	2	3	4	5
Comments/reordering						
4	Understand graphic design history in regards to the evolution of the field in graphic design styles and graphic design technology.	1	2	3	4	5
Comments/reordering						
5	Know the history and the applications of typography.	1	2	3	4	5
Comments/reordering						
6	Know advertising and marketing; types, styles, etc.	1	2	3	4	5
Comments/reordering						

	Regarding essential graphic design skill sets/knowledge, the post-secondary student will:	Least Important	Less Important	Important	More Important	Most Important
7	Differentiate high quality design from poor quality design.	1	2	3	4	5
Comments/reordering						
8	Develop the ability to problem solve.	1	2	3	4	5
Comments/reordering						
9	Develop the ability to work on a team as a team leader and team member.	1	2	3	4	5
Comments/reordering						
10	Know the design process.	1	2	3	4	5
Comments/reordering						
11	Understand layout design for printing and for Web.	1	2	3	4	5
Comments/reordering						
12	Knowledge of printing design software such as Adobe Photoshop, Illustrator, and InDesign and working with this software in combination with each other.	1	2	3	4	5
Comments/reordering						
13	Know how to transition colors from computer monitor (screen) to print media.	1	2	3	4	5
Comments/reordering						

	Regarding essential graphic design skill sets/knowledge, the post-secondary student will:	Least Important	Less Important	Important	More Important	Most Important
14	Know file types (.jpg, .tif, .psd, .pdf, etc.), their operation, advantages, and disadvantages of each.	1	2	3	4	5
Comments/reordering						
15	Understand photo composition.	1	2	3	4	5
Comments/reordering						
16	Understand photography dark room techniques, traditional and digital.	1	2	3	4	5
Comments/reordering						
17	Know Web design software such as, Adobe Dreamweaver and Flash.	1	2	3	4	5
Comments/reordering						
18	Understand 3D animation software, such as Autodesk's 3Dstudio Max and Maya.	1	2	3	4	5
Comments/reordering						
19	Know computer program languages, such as C++, PHP, and JavaScript.	1	2	3	4	5
Comments/reordering						
20	Know Internet languages, such as HTML, CSS, and XML.	1	2	3	4	5
Comments/reordering						

	Regarding essential graphic design skill sets/knowledge, the post-secondary student will:	Least Important	Less Important	Important	More Important	Most Important
21	Know the printing process of Lithography, Flexography, Gravure, Serigraphy (Screen Printing), and Digital.	1	2	3	4	5
Comments/reordering						
22	Know how to construct a book portfolio and digital portfolio	1	2	3	4	5
Comments/reordering						
23	Understand entrepreneurship with regards to the business aspects of freelancing.	1	2	3	4	5
Comments/reordering						
24	Understand the operation of a graphic design company or organization.	1	2	3	4	5
Comments/reordering						
25	Know uses of various Internet activities, such as social networking, for self-promotion.	1	2	3	4	5
Comments/reordering						
26	Know printing applications for various substrates and ink types.	1	2	3	4	5
Comments/reordering						

	Regarding essential graphic design skill sets/knowledge, the post-secondary student will:	Least Important	Less Important	Important	More Important	Most Important
27	Understand the use of sustainable resources in the field of graphic design.	1	2	3	4	5
Comments/reordering						
28	Know how to listen, write and speak effectively (good communication skills).	1	2	3	4	5
Comments/reordering						
29	Know current trends in the graphic design field	1	2	3	4	5
Comments/reordering						
30	Know planning, estimating, and scheduling	1	2	3	4	5
Comments/reordering						
31	Learn how to conceptualize design that follows a strategy	1	2	3	4	5
Comments/reordering						
32	Learn design as a solution to solving real world problems Through an internship or class with actual clients, products, or a company.	1	2	3	4	5
Comments/reordering						

Add Item		1	2	3	4	5
Add Item		1	2	3	4	5
Add Item		1	2	3	4	5
Add Item		1	2	3	4	5
Add Item		1	2	3	4	5
Add Item		1	2	3	4	5
Add Item		1	2	3	4	5
Add Item		1	2	3	4	5

End of Delphi Study Round

Appendix D

Modified Delphi Instrument Round 2

Essential Learning Objectives of a Graphic Designer, Post-Secondary

Delphi Study: Round 2

Context:

Thank you for your continued participation in this very important study on the essential skill set within graphic design.

Over the course of the study, you are being asked to identify those graphic design skill sets/knowledge that students who study graphic design or related field in a post secondary institution should gain prior to graduation. Please consider the task in terms of identifying essential skill sets or knowledge not specific classes.

The purpose of Round I was to rate essential design knowledge/skill sets items, reword them where needed, and to add any to the list that you believed were needed but missing.

The first purpose of Round 2 is to compare your individual rating of an item to the other participants' ratings of the item. This will give you a chance to change your rating for an item should you choose to do so.

Items, or parts of items, which have been reworded are presented in italics. If items closely related to a previous item, they were combined or reworded in such a way to incorporate both.

The range in which the middle 50 percent of participants rated an item will indicate a majority opinion about the importance of an item.

On this Round 2 instrument for each item, the ratings indicated by the middle 50 percent of participants and your individual rating will be indicated. You will be asked to change your rating to match the majority or retain your original rating and justify why you are retaining it.

The second purpose of Round 2 is to initially rate any new items that participants have indicated need to be included. The participant who added the item also rated the item. However, you will also be asked to rate the item yourself. When two or more new items were very similar or were very similar to an existing item, the added item was juried in order to combine new items from two or more participants.

Detailed, step-by-step instructions follow.

Please return this Round 2 instrument by December 13, 2011 to wjoshuaweaver@gmail.com.

Thank you in advance for your participation in this modified Delphi study.

To complete this second round of the study consider the following hypothetical example:

6. Say this is your Round 2 instrument below. Notice your own rating for the item from Round 1 on the right. Notice in this example, the participant (you) originally rated the item a **3** during Round 1. The middle **50 percent** of participants rated it a **4 or 5** (indicated in red and underlined numbers 4, 5).
7. In order to gain a better consensus, you may now consider changing your original rating to more closely match the other participants by marking the appropriate box next to comments from Round 1. If you see a majority rating consisting of three or more numbers, it means there is non-agreement within the group.
8. **Or** you may indicate that you do not want to change the rating. If you do not want to change your rating to match the majority, **Do Not mark a checkbox. You must indicate your reason by writing it in the space provided below the outcome item.**
9. When you go through the instrument you will see comments (in blue text) that participants posted under items from Round 1. You may consider those comments when it comes to deciding what to rate the item. The red text below shows where to write a justification for not rating an item with the majority.

Item #	Regarding essential graphic design skill sets/knowledge, the post-secondary student will:	Indicate New Round 2 Rating Here					Your Rating
Example	Develop the ability to work in a team	1	2	3	<u>4</u>	<u>5</u>	3
Comments	Very Important to a Designer						
Justify here if different than majority	Now simply add your justification here for not rating this item with the majority.						

10. Items were added by participants in Round 1. You must also go ahead and rate those items as shown below. To do this, simply delete the number you wish to rate the item. You may also suggest rewordings of the item. For your information, the rating at which the authoring participant rated the new item is provided to the right. Below the authoring participant rated the item at a 3, and the participant (you) rated the item a 4.

Items Added in Round 1	New Items Added by Participants	Least Important	Less Important	Important	More Important	Most Important	Author Rating
48	Applies mathematics to the engineering design process.	1	2	3	4	5	3
Comments/ Rewording							

Modified Delphi Instrument begins next page.

Item	Skill set/Knowledge	Rating Scale					
	Regarding essential graphic design skill sets/knowledge, the post-secondary student will:	Least Important	Less Important	Important	More Important	Most Important	Your Rating
1	Understand the elements of graphic design; line, shape, direction, size, texture, color, and value.	1	2	3	<u>4</u>	<u>5</u>	
Comments Round 1	Summarization of Comments: This is core knowledge that many seem to forget these days, using the computer as a crutch rather than a tool to implement the above. Color theory is very important—it's good to have when backing up a proposed color scheme						
Justify here if different than majority							
2	Understand the principles of graphic design; balance, gradation, repetition, contrast, harmony, dominance, and unity.	1	2	3	4	<u>5</u>	
Comments Round 1	Summarization of comments: Critical knowledge. Same as above.						
Justify here if different than majority							

Item	<u>Skill set/Knowledge</u>	Rating Scale					
	Regarding essential graphic design skill sets/knowledge, the post-secondary student will:	Least Important	Less Important	Important	More Important	Most Important	Your Rating
3	Understand drawing techniques, including different mediums such as pencil, ink, and charcoal. <i>Know how to sketch and draw to construct concept.</i>	1	2	<u>3</u>	<u>4</u>	5	
Comments Round 1	Drawing ability is the language of a graphic designer. A graphic designer needs to have the ability to communicate their ideas in a visual way....FAST. The ability to draw HAS to be there or the designer is a mute when s/he tries to explain their idea/mental picture. Still important, but not as much these days. Learn to think with a pencil. Build concepts up from sketching.						
Justify here if different than majority							
4	Understand graphic design history in regards to the evolution of the field in graphic design styles and graphic design technology.	1	2	<u>3</u>	<u>4</u>	<u>5</u>	
Comments Round 1	This is important when socializing within the Design community and becoming accepted and respected within said community, but honestly most clients could care less whether you know this stuff or not. Important to become a more complete designer						
Justify here if different than majority							

Item	<u>Skill set/Knowledge</u>	Rating Scale					
	Regarding essential graphic design skill sets/knowledge, the post-secondary student will:	Least Important	Less Important	Important	More Important	Most Important	Your Rating
5	Know the history and the applications of typography.	1	2	3	<u>4</u>	<u>5</u>	
Comments	Summarization of Comments: Typography is vital. Maybe not the history as much as the application, the new applications allow for so many bad habits.						
Justify here if different than majority							
6	Know Advertising and Marketing; types styles, etc.	1	2	<u>3</u>	<u>4</u>	<u>5</u>	
Comments	A lot of this can be learned on the job. It will be important to distinguish the differences between various types of agencies/marketing firms to determine the best fit for yourself. Know the name of the agency too. Do not just like a commercial or a print ad. Know who did it. Then figure out how they agency got the client to agree to it. Not crucial information although helpful. You have to know the terminology.						
Justify here if different than majority							

Item	Skill set/Knowledge	Rating Scale					
	Regarding essential graphic design skill sets/knowledge, the post-secondary student will:	Least Important	Less Important	Important	More Important	Most Important	Your Rating
7	Differentiate high quality design from poor quality design.	1	2	3	<u>4</u>	<u>5</u>	
Comments Round 1	This is totally subjective. If the graphic designer cannot do this, their work will be the poor quality design. Promise. If you cannot identify high quality design then you sure are going to have a hard time consistently producing it! Or be able to convey in words (to a client, etc.) what constitutes an effective design and why it works. Again, you have to be able to back up your designs.						
Justify here if different than majority							
8	Develop the ability to problem solve.	1	2	3	4	<u>5</u>	
Comments Round 1	Important, but somewhat learned over time. Not necessarily in a classroom environment. Being a proactive problem solver is a skill that really helps you stand out from the crowd. Solve the problem before it's even an issue						
Justify here if different than majority							

Item	Skill set/Knowledge	Rating Scale					Your Rating
		Least Important	Less Important	Important	More Important	Most Important	
9	Develop the ability to work on a team as a team leader and team member.	1	2	3	<u>4</u>	<u>5</u>	
Comments Round 1	This is helpful when working with others, but not always necessary. Though it's important to NOT have an ego when designing for a client, or when working in a large company. It's always a compromise. In a corporate setting, this is a key to success. Delegate tasks, set goals and meet them.						
Justify here if different than majority							
10	Know the design process.	1	2	3	<u>4</u>	<u>5</u>	
Comments Round 1	Summarization of Comments: Design processes can vary from agency to agency. Design does not have a process. Design process is very individual.						
Justify here if different than majority							

Item	Skill set/Knowledge	Rating Scale					Your Rating
		Least Important	Less Important	Important	More Important	Most Important	
11	Understand layout design for printing and for Web.	1	2	3	<u>4</u>	<u>5</u>	
Comments Round 1	Knowing the limitations associated with print production and digital is essential to designing great work. These can be two separate disciplines. The Web is everything now. I believe that print is not dead, YET. Not same soft or principals as design for print, typically a different corporate group with in an agency. Printers hate crappy files.						
Justify here if different than majority							
12	Knowledge of printing design software such as Adobe Photoshop, Illustrator, and InDesign and working with this software in combination with each other.	1	2	3	4	<u>5</u>	
Comments Round 1	Summarization of Comments: ESSENTIAL!						
Justify here if different than majority							

Item	Skill set/Knowledge	Rating Scale					Your Rating
		Least Important	Less Important	Important	More Important	Most Important	
13	Regarding essential graphic design skill sets/knowledge, the post-secondary student will: Know how to transition colors from computer monitor (screen) to print media.	1	2	<u>3</u>	<u>4</u>	<u>5</u>	
Comments Round 1	If you choose to work in the print field can be learned on the job. Computer monitor color gamut is significantly higher than the color gamut of ink on paper - it will always look prettier on the monitor. Set proper expectations early on. And to online. Not as important with the decline in print media. Often this is a color mgmt. staff members only job						
Justify here if different than majority							
14	Know file types (.jpg, .tif, .psd, .pdf, etc.), their operation, advantages, and disadvantages of each.	1	2	3	<u>4</u>	<u>5</u>	
Comments Round 1	I still do not know as much as I wish I did about these things!						
Justify here if different than majority							

Item	Skill set/Knowledge	Rating Scale					Your Rating
		Least Important	Less Important	Important	More Important	Most Important	
15	Understand photo composition.	1	2	3	<u>4</u>	<u>5</u>	
Comments Round 1	Helps with Photoshop and general composition needs. You can have an awesome layout and then the photo looks like crap or was poorly set up and it will change the whole look of an ad or layout.						
Justify here if different than majority							

16	Understand photography dark room techniques, traditional and digital.	1	<u>2</u>	<u>3</u>	4	5	
Comments Round 1	Helps with Photoshop. I do not think you necessarily should be able to do it, but understand what can be done so it can be accomplished for your needs is important. This is helpful, especially in regards to digital photography. Traditional techniques are not essential, but having an understanding of them would benefit the student.						
Justify here if different than majority							

Item	Skill set/Knowledge	Rating Scale					Your Rating
		Least Important	Less Important	Important	More Important	Most Important	
17	Know Web design software such as, Adobe Dreamweaver and Flash.	1	2	<u>3</u>	<u>4</u>	<u>5</u>	
Comments Round 1	Summarization of Comments: Industry is heading that way. Graphic Designer is different then Web Designer. Two Different jobs. Clients now want print and Web from the same designer.						
Justify here if different than majority							

18	Understand 3D animation software, such as Autodesk's 3Dstudio Max and Maya.	1	<u>2</u>	<u>3</u>	4	5	
Comments Round 1	Summarization of Comments: If you choose to work in the animation field. Often this is a specialist.						
Justify here if different than majority							
19	Know computer program languages, such as C++, PHP, and JavaScript.	<u>1</u>	<u>2</u>	<u>3</u>	4	5	
Comments Round 1	Summarization of Comments: Industry is heading that way. Java is more helpful to the designer. Depends on what you get into. Web developers usually handle this.						
Justify here if different than majority							

Item	Skill set/Knowledge	Rating Scale					Your Rating
		Least Important	Less Important	Important	More Important	Most Important	
20	Regarding essential graphic design skill sets/knowledge, the post-secondary student will: Know Internet languages, such as HTML, CSS, and XML.	1	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	
Comments Round 1	Summarization of Comments: Industry is heading towards this. If you choose to work in this field. Often Web developers handle this.						
Justify here if different than majority							

21	Know the printing process of Lithography, Flexography, Gravure, Serigraphy (Screen Printing), and Digital.	1	<u>2</u>	<u>3</u>	<u>4</u>	5	
Comments Round 1	Summarization of Comments: If you choose to work in this field. Vital to Packaging. Know the limitations of each process.						
Justify here if different than majority							
22	Know how to construct a book portfolio and digital portfolio	1	2	3	<u>4</u>	<u>5</u>	
Comments Round 1	Summarization of Comments: Your book sells you. It has to look great and speak for itself! Both are crucial even if everything is digital these days. Cannot get a job without one of the two, preferably both these days. More digital and PDF than book.						
Justify here if different than majority							

Item	Skill set/Knowledge	Rating Scale					Your Rating
		Least Important	Less Important	Important	More Important	Most Important	
23	Regarding essential graphic design skill sets/knowledge, the post-secondary student will: Understand entrepreneurship with regards to the business aspects of freelancing.	1	2	3	<u>4</u>	<u>5</u>	
Comments Round	Summarization of Comments: Makes you much better in a team environment in corporate setting. Only if you plan to be a freelancer. Learn what to charge and Legal aspects.						
Justify here if different than majority							

24	Understand the operation of a graphic design company or organization.	1	2	<u>3</u>	<u>4</u>	5	
Comments Round 1	Summarization of Comments. Companies vary. Only if you are going to be on your own or run your own studio.						
Justify here if different than majority							
25	Know uses of various Internet activities, such as social networking, for self-promotion.	1	2	<u>3</u>	<u>4</u>	5	
Comments Round 1	Summarization of Comments: You need social networking skills for companies as well! So popular these days, it would be great to know more. Depends on what you are trying to accomplish.						
Justify here if different than majority							

Item	Skill set/Knowledge	Rating Scale				
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	Regarding essential graphic design skill sets/knowledge, the post-secondary student will:	Least Important	Less Important	Important	More Important	Most Important	Your Rating
26	Know printing applications for various substrates and ink types.	1	<u>2</u>	<u>3</u>	<u>4</u>	5	
Comments Round 1	Summarization of Comments: If you choose to work in the print field. ABSOLUTELY! Lot can be learned on job. And only if you work in a print shop.						
Justify here if different than majority							

27	Understand the use of sustainable resources in the field of graphic design.	1	<u>2</u>	<u>3</u>	<u>4</u>	5	
Comments Round 1	Summarization of Comments: Important, but kind of a bonus. A lifestyle choice, in a company a designer might not have say so. Personally important thing.						
Justify here if different than majority							
28	Know how to listen, write and speak effectively (good communication skills).	1	2	3	<u>4</u>	<u>5</u>	
Comments Round 1	Summarization of Comments: Crucial in this field and in life. Most important to Listen.						
Justify here if different than majority							

Item	Skill set/Knowledge	Rating Scale					Your Rating
		Least Important	Less Important	Important	More Important	Most Important	
29	Regarding essential graphic design skill sets/knowledge, the post-secondary student will: Know current trends in the graphic design field	1	2	<u>3</u>	<u>4</u>	<u>5</u>	
Comments Round 1	Summarization of Comments: Should be an ongoing thing. Do not be a slave to trends. Know who/what companies are producing this work.						
Justify here if different than majority							

30	Know planning, estimating, and scheduling	1	2	<u>3</u>	<u>4</u>	<u>5</u>	
Comments Round 1	Summarization of Comments: Not as much if working for a company. Time management is key. Good to have general idea.						
Justify here if different than majority							
31	Learn how to conceptualize design that follows a strategy	1	2	3	<u>4</u>	<u>5</u>	
Comments Round 1	Summarization of Comments: Crucial. Hard to have a design w/o a strategy						
Justify here if different than majority							

Item	Skill set/Knowledge	Rating Scale					Your Rating
		Least Important	Less Important	Important	More Important	Most Important	
32	Regarding essential graphic design skill sets/knowledge, the post-secondary student will: Learn design as a solution to solving real world problems Through an internship or class with actual clients, products, or a company.	1	2	3	<u>4</u>	<u>5</u>	
Comments Round 1	Summarization of Comments: Nothing like real world experience. Unpaid internships lead to poor jobs. Taking on actual clients before you know what you are doing is a way to build a bad reputation. Very Important.						
Justify here if different than majority							

<u>NEW ITEMS</u>							
33	Understanding of culture, where it's been and where it's going.	1	2	3	4	5	
Comments/ Rewording							
34	Learn how to give constructive input on design work	1	2	3	4	5	
Comments/ Rewording							
35	Learn how to manage other designers/creatives	1	2	3	4	5	
Comments/ Rewording							

Item	<u>Skill set/Knowledge</u>	Rating Scale					
	Regarding essential graphic design skill sets/knowledge, the post-secondary student will:	Least Important	Less Important	Important	More Important	Most Important	Your rating
36	Know how to conceptualize with a copywriter to solve design problems.	1	2	3	4	5	
Comments/ Rewording							
37	Learn CMS tools (Wordpress, Joomla, etc.) and how to design using them.	1	2	3	4	5	
Comments/ Rewording							
38	Design Iphone and related apps	1	2	3	4	5	
Comments/ Rewording							
39	Strong, effective production skills as well as design	1	2	3	4	5	
Comments/ Rewording							

Item	Skill set/Knowledge	Rating Scale					Your rating
		Least Important	Less Important	Important	More Important	Most Important	
40	Regarding essential graphic design skill sets/knowledge, the post-secondary student will: Understand client needs, and deliver on time.	1	2	3	4	5	
Comments/Re wording							
41	Cross platform knowledge work with Mac and PC	1	2	3	4	5	
Comments/Re wording							
42	Learn about licensing of images, music, video, etc. for resources for design work.	1	2	3	4	5	
Comments/Re wording							
43	Understand how to effectively keep financial records and budget expenses.	1	2	3	4	5	
Comments/Re wording							

Appendix E

Modified Delphi Instrument Round 3

Essential Learning Objectives of a Graphic Designer, Post-Secondary

Delphi Study: Round 3 FINAL ROUND

Context:

Thank you for your continued participation in this very important study on the essential skill set within graphic design.

Over the course of the study, you are being asked to identify those graphic design skill sets/knowledge that students who study graphic design or related field in a post secondary institution should gain prior to graduation. Please consider the task in terms of identifying essential skill sets or knowledge not specific classes.

The purpose of Round 2 was to compare your individual rating of an item to the other participants' ratings of the item. This will give you a chance to change your rating for an item should you choose to do so.

The purpose of Round 3 is to rate essential skill set within graphic design one last time in attempt to secure a better consensus about each item.

The range in which the middle 50 percent of participants rated an item will indicate a majority opinion about the importance of an item.

On this Round 3 instrument for each item, the ratings indicated by the middle 50 percent of participants and your individual rating will be indicated. The absolute median rating is also indicated. That is the rating most participants voted for. You will be asked to change your rating to match the majority or retain your original rating and justify why you are retaining it.

Detailed, step-by-step instructions follow.

Please return this Round 3 instrument by January 31, 2012 to wjoshuaweaver@gmail.com.

Thank you in advance for your participation in this modified Delphi study.

To complete this third round of the study consider the following hypothetical example:

1. Say this is your Round 3 instrument below. Notice your own rating for the item from Round 1 on the right. Notice in this example, the participant (you) originally rated the item a **3** during Round 1. The middle **50 percent** of participants rated it a **4 or 5** (indicated in red and underlined numbers **4, 5**).
2. In order to gain a better consensus, you may now consider changing your original rating to more closely match the other participants by marking the appropriate box next to comments from Round 1. **If you see a majority rating consisting of three or more numbers, it means there is non- agreement/consensus within the group.**
3. **Or** you may indicate that you do not want to change the rating. **If you do not want to change your rating to match the majority, Do Not mark a checkbox. You must indicate your reason by writing it in the space provided below the outcome item.**
4. When you go through the instrument you will see comments (in blue text for Round 1. Round 2 comments in green) that participants posted under items from Round 1 & 2. You may consider those comments when it comes to deciding what to rate the item. The red text below shows where to write a justification for not rating an item with the majority.

Item #	Regarding essential graphic design skill sets/knowledge, the post-secondary student will:	Indicate New Round 3 Rating Here					Your Rating
Example	Develop the ability to work in a team	1	2	3	<u>4</u>	<u>5</u>	3
Comments Round 1&2	This is vital Very Important to a Designer						
Justify here if different than majority	Now simply add your justification here for not rating this item with the majority.						

5. New items that were on Round 2 survey will now show a majority rating. You will be asked to change your original rating if it does not match the majority or keep your initial rating and justify why.

Item	<u>Skill set/Knowledge</u>	Rating Scale					
	Regarding essential graphic design skill sets/knowledge, the post-secondary student will:	Least Important	Less Important	Important	More Important	Most Important	Your Rating
1	Understand the elements of graphic design; line, shape, direction, size, texture, color, and value.	1	2	3	<u>4</u>	<u>5</u>	
Comments Round 1 & 2	While it is no doubt important and necessary to have a strong base of understanding, these skills are not any more important than others, i.e. time management, working with a team, pricing your work, etc. Summarization of Comments: This is core knowledge that many seem to forget these days, using the computer as a crutch rather than a tool to implement the above. Color theory is very important—it's good to have when backing up a proposed color scheme						
Justify here if different than majority							
2	Understand the principles of graphic design; balance, gradation, repetition, contrast, harmony, dominance, and unity.	1	2	3	4	<u>5</u>	
Comments Round 1 & 2	Also, as you become more experienced and view a lot of great work (and compare yours to it), you will absorb this. It may however be helpful to learn some terminology for when you are explaining or defending your work. Summarization of comments: Critical knowledge. Same as above.						
Justify here if different than majority							

Item	<u>Skill set/Knowledge</u>	Rating Scale					
	Regarding essential graphic design skill sets/knowledge, the post-secondary student will:	Least Important	Less Important	Important	More Important	Most Important	Your Rating
3	Understand drawing techniques, including different mediums such as pencil, ink, and charcoal. <i>Know how to sketch and draw to construct concept.</i>	1	2	<u>3</u>	<u>4</u>	5	
Comments Round 1& 2	<p>Summarization of Comments: good to not rely solely on the computer. While it is not essential for gaining a career, the ability to communicate my ideas on mediums other than a computer screen is what has set me apart from most of my peers.</p> <p>Drawing ability is the language of a graphic designer. A graphic designer needs to have the ability to communicate their ideas in a visual way....FAST. The ability to draw HAS to be there or the designer is a mute when s/he tries to explain their idea/mental picture. Still important, but not as much these days. Learn to think with a pencil. Build concepts up from sketching.</p>						
Justify here if different than majority							

4	Understand graphic design history in regards to the evolution of the field in graphic design styles and graphic design technology.	1	2	<u>3</u>	<u>4</u>	<u>5</u>	
Comments Round 1& 2	<p>History is always good to know. But at the end of the day, no client cares. They just want what is in current style, and what makes their company look like its on the competing edge. It is only of moderate importance in the day-to-day operations of a graphic designer.</p> <p>This is important when socializing within the Design community and becoming accepted and respected within said community, but honestly most clients could care less whether you know this stuff or not.</p> <p>Important to become a more complete designer</p>						
Justify here if different than majority							
5	Know the history and the applications of typography.	1	2	3	<u>4</u>	<u>5</u>	
Comments Round 1& 2	<p>Everyone should watch the documentary Helvetica.</p> <p>Summarization of Comments: Typography is vital. Maybe not the history as much as the application, the new applications allow for so many bad habits.</p>						
Justify here if different than majority							

Item	Skill set/Knowledge	Rating Scale					
	Regarding essential graphic design skill sets/knowledge, the post-secondary student will:	Least Important	Less Important	Important	More Important	Most Important	Your Rating
6	Know Advertising and Marketing; types styles, etc.	1	2	<u>3</u>	<u>4</u>	<u>5</u>	
Comments Round 1 & 2	<p>You need to know about different types of advertising and marketing. Your designs will change depending where it is going to be used. Example: a B2B environment vs. a B2C environment.</p> <p>A lot of this can be learned on the job. It will be important to distinguish the differences between various types of agencies/marketing firms to determine the best fit for yourself. Know the name of the agency too. Do not just like a commercial or a print ad. Know who did it. Then figure out how they agency got the client to agree to it. Not crucial information although helpful. You have to know the terminology.</p>						
Justify here if different than majority							

Item	<u>Skill set/Knowledge</u>	Rating Scale					
	Regarding essential graphic design skill sets/knowledge, the post-secondary student will:	Least Impo rtant	Less Impo rtant	Impo rtant	More Impo rtant	Most Impo rtant	Your Ratin g
7	Differentiate high quality design from poor quality design.	1	2	3	<u>4</u>	<u>5</u>	
Comments Round 1& 2	<p>This IS totally subjective. Who's to say what is high quality and what is not? What's important is the message and that it not get lost in "Great" design. A simple design will not create this distraction.</p> <p>This is totally subjective. If the graphic designer cannot do this, their work will be the poor quality design. Promise. If you cannot identify high quality design then you sure are going to have a hard time consistently producing it! Or be able to convey in words (to a client, etc.) what constitutes an effective design and why it works. Again, you have to be able to back up your designs.</p>						
Justify here if different than majority							
8	Develop the ability to problem solve.	1	2	3	4	<u>5</u>	
Comments Round 1& 2	<p>Yes, it can be learned, but if you are already good at it this sets you apart and may be the difference between being hired as a production artist and being hired as a director or manager. Important, but somewhat learned over time. Not necessarily in a classroom environment. Being a proactive problem solver is a skill that really helps you stand out from the crowd. Solve the problem before it's even an issue</p>						
Justify here if different than majority							

Item	Skill set/Knowledge	Rating Scale					Your Rating
		Least Important	Less Important	Important	More Important	Most Important	
9	Develop the ability to work on a team as a team leader and team member.	1	2	3	<u>4</u>	<u>5</u>	
Comments Round 1 & 2	<p>Team Member and team leader are two different things. I've worked in an environment where everyone wants to be the chief. That created conflict. I'm a doer and I do it well and efficiently and if I have to I'll put in the long hours to achieve the goals. That's not team leadership but essential skills nonetheless.</p> <p>This is helpful when working with others, but not always necessary. Though it's important to NOT have an ego when designing for a client, or when working in a large company. It's always a compromise. In a corporate setting, this is a key to success. Delegate tasks, set goals and meet them.</p>						
Justify here if different than majority							
10	Know the design process.	1	2	<u>3</u>	<u>4</u>	<u>5</u>	
Comments Round 1 & 2	<p>People need to find their own way of designing. One way is not better than another if the end result is still great. Design is not an assembly line process.</p> <p>Summarization of Comments: Design processes can vary from agency to agency. Design does not have a process. design process is very individual.</p>						
Justify here if different than majority							

Item	Skill set/Knowledge	Rating Scale					Your Rating
		Least Important	Less Important	Important	More Important	Most Important	
11	Regarding essential graphic design skill sets/knowledge, the post-secondary student will: Understand layout design for printing and for Web.	1	2	3	<u>4</u>	<u>5</u>	
Comments Round 1 & 2	Important but very easy to pick up and understand. Knowing the limitations associated with print production and digital is essential to designing great work. These can be two separate disciplines. The Web is everything now. I believe that print is not dead, YET. Not same soft or principals as design for print, typically a different corporate group with in an agency. Printers hate crappy files.						
Justify here if different than majority							
12	Knowledge of printing design software such as Adobe Photoshop, Illustrator, and InDesign and working with this software in combination with each other.	1	2	3	<u>4</u>	<u>5</u>	
Comments Round 1 & 2	Summarization of Comments: ESSENTIAL!						
Justify here if different than majority							

Item	Skill set/Knowledge	Rating Scale					Your Rating
		Least Important	Less Important	Important	More Important	Most Important	
13	Regarding essential graphic design skill sets/knowledge, the post-secondary student will: Know how to transition colors from computer monitor (screen) to print media.	1	2	<u>3</u>	<u>4</u>	<u>5</u>	
Comments Round 1 & 2	This skill is usually learned on the job in the print field. In the grand scheme of design education, this is, to me, less important than learning about design. If you choose to work in the print field can be learned on the job. Computer monitor color gamut is significantly higher than the color gamut of ink on paper - it will always look prettier on the monitor. Set proper expectations early on. And to online. Not as important with the decline in print media. Often this is a color management staff members only job						
Justify here if different than majority							
14	Know file types (.jpg, .tif, .psd, .pdf, etc.), their operation, advantages, and disadvantages of each.	1	2	3	<u>4</u>	<u>5</u>	
Comments Round 1 & 2	Again, I believe knowledge of the different file types are important, but there are things that most students know from experience and are easy enough to learn about on their own I still do not know as much as I wish I did about these things.						
Justify here if different than majority							

Item	Skill set/Knowledge	Rating Scale					Your Rating
		Least Important	Less Important	Important	More Important	Most Important	
15	Understand photo composition.	1	2	3	<u>4</u>	<u>5</u>	
Comments Round 1 & 2	<p>This coincides with the darkroom knowledge. Important for understanding what the different options in Photoshop are for. Photoshop is an essential program. Important but if someone understands composition in general, they should understand composition in photography.</p> <p>Helps with Photoshop and general composition needs. You can have an awesome layout and then the photo looks like crap or was poorly set up and it will change the whole look of an ad or layout.</p>						
Justify here if different than majority							
16	Understand photography dark room techniques, traditional and digital.	1	<u>2</u>	<u>3</u>	4	5	
Comments Round 1 & 2	<p>A crucial skill, as so many images are manipulated in the computer. To know why from basic photography techniques helps in getting to the desired solutions.</p> <p>Helps with Photoshop. I do not think you necessarily should be able to do it, but understand what can be done so it can be accomplished for your needs is important. This is helpful, especially in regards to digital photography. Traditional techniques are not essential, but having an understanding of them would benefit the student.</p>						
Justify here if different than majority							

Item	Skill set/Knowledge	Rating Scale					Your Rating
		Least Important	Less Important	Important	More Important	Most Important	
17	Regarding essential graphic design skill sets/knowledge, the post-secondary student will: Know Web design software such as, Adobe Dreamweaver and Flash.	1	2	<u>3</u>	<u>4</u>	<u>5</u>	
Comments Round 1& 2	Find your niche and focus your skills on what you want to do best! It's HARD to stay away from the technical side of Web development. We are all designers first. Not in the world of packaging. As long as there are products, there will be packaging. They need graphics and they need to be printed. That is the reality of packaging and Web is ancillary to it. Be a Web designer if you want to learn Dreamweaver and Flash. I talked recently to many creative directors and art directors. They have all stated how the advertising and graphics industry is changing. They see the vast majority of work in the Web area rather than print. Summarization of Comments: Industry is heading that way. Graphic Designer is different then Web Designer. Two Different jobs. Clients now want print and Web from the same designer.						
Justify here if different than majority							

Item	Skill set/Knowledge	Rating Scale					Your Rating
		Least Important	Less Important	Important	More Important	Most Important	
18	Regarding essential graphic design skill sets/knowledge, the post-secondary student will: Understand 3D animation software, such as Autodesk's 3Dstudio Max and Maya.	1	<u>2</u>	<u>3</u>	4	5	
Comments Round 1& 2	Least important to my area of expertise. Graphic design and 3D animation - 2 different disciplines in my book. 3D software is becoming very important in package design as a way to show a better representation of a product on shelf. Summarization of Comments: If you choose to work in the animation field. Often this is a specialist.						
Justify here if different than majority							
19	Know computer program languages, such as C++, PHP, and JavaScript.	<u>1</u>	<u>2</u>	<u>3</u>	4	5	
Comments Round 1& 2	Very important if you want to design in a Web based medium. C++ is not as important in my opinion, but PHP and JavaScript are very important if you want to succeed in Web design. Summarization of Comments: Industry is heading that way. Java is more helpful to the designer. Depends on what you get into. Web developers usually handle this.						
Justify here if different than majority							

Item	Skill set/Knowledge	Rating Scale					Your Rating
		Least Important	Less Important	Important	More Important	Most Important	
20	Regarding essential graphic design skill sets/knowledge, the post-secondary student will: Know Internet languages, such as HTML, CSS, and XML.	1	<u>2</u>	<u>3</u>	<u>4</u>	5	
Comments Round 1& 2	Good to know what the programming can and cannot do so that you create designs that can translate over to the Web and be exactly as you designed them. However, not necessary to know how to code it yourself. There's programming geeks for that. Internet languages have zero bearing on packaging design. Summarization of Comments: Industry is heading towards this. If you choose to work in this field. Often Web developers handle this.						
Justify here if different than majority							
21	Know the printing process of Lithography, Flexography, Gravure, Serigraphy (Screen Printing), and Digital.	1	<u>2</u>	<u>3</u>	<u>4</u>	5	
Comments Round 1& 2	My specialty is package design, so that is why I rate it most important. It can be great design but, if it does not meet the requirements of the process in which it will be printed, it is useless. Even worse, the client was sold on a concept that cannot be produced Summarization of Comments: If you choose to work in this field. Vital to Packaging. Know the limitations of each process.						
Justify here if different than majority							

Item	<u>Skill set/Knowledge</u>	Rating Scale					
	Regarding essential graphic design skill sets/knowledge, the post-secondary student will:	Least Important	Less Important	Important	More Important	Most Important	Your Rating
22	Know how to construct a book portfolio and digital portfolio	1	2	3	<u>4</u>	<u>5</u>	
Comments Round 1& 2	Summarization of Comments: Your book sells you. It has to look great and speak for itself! Both are crucial even if everything is digital these days. Cannot get a job without one of the two, preferably both these days. More digital and PDF than book.						
Justify here if different than majority							
23	Understand entrepreneurship with regards to the business aspects of freelancing.	1	2	3	<u>4</u>	<u>5</u>	
Comments Round 1& 2	Important for freelancing but not the most important trait of a designer. If you know how to operate your own freelance business you will never be out of work. It is also go training for a management position. Summarization of Comments: Makes you much better in a team environment in corporate setting. Only if you plan to be a freelancer. Learn what to charge and Legal aspects.						
Justify here if different than majority							

Item	Skill set/Knowledge	Rating Scale					
	Regarding essential graphic design skill sets/knowledge, the post-secondary student will:	Least Important	Less Important	Important	More Important	Most Important	Your Rating
24	Understand the operation of a graphic design company or organization.	1	2	<u>3</u>	<u>4</u>	5	
Comments Round 1 & 2	<p>This is important because creative departments are much different than any other department in a company. This helps other departments work with us and get the best product possible. Its important to set up the organization correctly so that other departments know how you function, otherwise you turn into a production monkey and end up just doing what everyone says with or without a good reason. I find it helps to get an understanding of the company structure so as to get a better idea how each co-worker visualizes the creative work that is produced.</p> <p>Summarization of Comments. Companies vary. Only if you are going to be on your own or run your own studio.</p>						
Justify here if different than majority							

Item	Skill set/Knowledge	Rating Scale					Your Rating
		Least Important	Less Important	Important	More Important	Most Important	
25	Regarding essential graphic design skill sets/knowledge, the post-secondary student will: Know uses of various Internet activities, such as social networking, for self-promotion.	1	2	<u>3</u>	<u>4</u>	5	
Comments Round 1 & 2	It really helps with regards to finding new employment. Networking always helps. Too many people are great at blowing time on face book and twitter but are short on actual social skills face to face. Summarization of Comments: You need social networking skills for companies as well! So popular these days, it would be great to know more. Depends on what you are trying to accomplish.						
Justify here if different than majority							
26	Know printing applications for various substrates and ink types.	1	2	<u>3</u>	<u>4</u>	5	
Comments Round 1 & 2	Not really correct. If you work in a print shop, you are running what they give you on what they tell you to print on. If you are designing for packaging, understanding limitations of various print methods on various substrates is critical. Summarization of Comments: If you choose to work in the print field. ABSOLUTELY! Lot can be learned on job. And only if you work in a print shop.						
Justify here if different than majority							

Item	Skill set/Knowledge	Rating Scale					Your Rating
		Least Important	Less Important	Important	More Important	Most Important	
27	Regarding essential graphic design skill sets/knowledge, the post-secondary student will: Understand the use of sustainable resources in the field of graphic design.	1	<u>2</u>	<u>3</u>	<u>4</u>	5	
Comments Round 1 & 2	Clients could care less. They want what's cheapest and what looks nicest. Unfortunately that's not the recycled papers. Summarization of Comments: Important, but kind of a bonus. A lifestyle choice, in a company a designer might not have say so. Personally important thing.						
Justify here if different than majority							
28	Know how to listen, write and speak effectively (good communication skills).	1	2	3	4	<u>5</u>	
Comments Round 1 & 2	Summarization of Comments: Crucial in this field and in life. Most important to Listen.						
Justify here if different than majority							

Item	Skill set/Knowledge	Rating Scale					
	Regarding essential graphic design skill sets/knowledge, the post-secondary student will:	Least Important	Less Important	Important	More Important	Most Important	Your Rating
29	Know current trends in the graphic design field	1	2	<u>3</u>	<u>4</u>	<u>5</u>	
Comments Round 1 & 2	Summarization of Comments: Should be an ongoing thing. Do not be a slave to trends. Know who/what companies are producing this work.						
Justify here if different than majority							
30	Know planning, estimating, and scheduling	1	2	<u>3</u>	<u>4</u>	<u>5</u>	
Comments Round 1 & 21	Summation does not equate to majority rating. Time management is important. You MUST hit the deadline and plan for the unexpected. But, that was not the parameters of the stated skill set. Summarization of Comments: Not as much if working for a company. Time management is key. Good to have general idea.						
Justify here if different than majority							
31	Learn how to conceptualize design that follows a strategy	1	2	3	<u>4</u>	<u>5</u>	
Comments Round 1 & 2	Strategy may apply to page layout, ads but packaging, not really. Summarization of Comments: Crucial. Hard to have a design w/o a strategy						
Justify here if different than majority							

Item	Skill set/Knowledge	Rating Scale					
	Regarding essential graphic design skill sets/knowledge, the post-secondary student will:	Least Important	Less Important	Important	More Important	Most Important	Your Rating
32	Learn design as a solution to solving real world problems Through an internship or class with actual clients, products, or a company.	1	2	3	<u>4</u>	<u>5</u>	
Comments Round 1 & 2	<p>I do not know why an unpaid internship would necessarily lead to poor jobs. Do not agree with that. Work along side someone who knows what they are doing on your first jobs. Usually you always have a boss at first and they will be monitoring you especially since you are new to the field. I strongly encourage you to work at a company before going out on your own right out of school!</p> <p>Summarization of Comments: Nothing like real world experience. Unpaid internships lead to poor jobs. Taking on actual clients before you know what you are doing is a way to build a bad reputation. Very Important.</p>						
Justify here if different than majority							
33	Understanding of culture, where it's been and where it's going.	1	2	<u>3</u>	<u>4</u>	5	
Comments Round 2	Especially with regards to Design History. You definitely want to explore this so that you know what you are getting into.						
Justify here if different than majority							

Item	<u>Skill set/Knowledge</u>	Rating Scale					
	Regarding essential graphic design skill sets/knowledge, the post-secondary student will:	Least Important	Less Important	Important	More Important	Most Important	Your Rating
34	Learn how to give constructive input on design work	1	2	3	<u>4</u>	<u>5</u>	
Comments Round 2	Usually you do not get to give much input; rather you get to listen a lot. Learn how to play well with others. Absolutely! If you do not like something, back it up with Why, not just that you do not like it. Not a good enough reason.						
Justify here if different than majority							
35	Learn how to manage other designers/creatives	1	2	3	<u>4</u>	<u>5</u>	
Comments Round 2	Summarization: This is good if you plan on becoming a Creative Director. However, there's a different skill set between the type of personality that a creative director needs and one that a normal art director or graphic designer needs. This will certainly be important if your ultimate goal is to become a team manager. Hard to teach in school when money is not involved.						
Justify here if different than majority							

Item	<u>Skill set/Knowledge</u>	Rating Scale					
	Regarding essential graphic design skill sets/knowledge, the post-secondary student will:	Least Important	Less Important	Important	More Important	Most Important	Your Rating
36	Know how to conceptualize with a copywriter to solve design problems.	1	2	3	<u>4</u>	<u>5</u>	
Comments Round 2	Usually when working on advertising projects, like print ads, TV spots, etc. This is a combination of Item 8 and 31. Does not really need to be here. Thinking in a team is vital to collaboration in the workplace						
Justify here if different than majority							
37	Learn CMS tools (Wordpress, Joomla, etc.) and how to design using them.	1	2	<u>3</u>	<u>4</u>	5	
Comments Round 2	This is getting more and more mainstream. Yes, I think this can be important if you want to design in a website medium, but this is related to Item 19 & 20. These are NOT industry standard design software apps.						
Justify here if different than majority							

Item	<u>Skill set/Knowledge</u>	Rating Scale					
	Regarding essential graphic design skill sets/knowledge, the post-secondary student will:	Least Important	Less Important	Important	More Important	Most Important	Your Rating
38	Design Iphone and related apps	1	<u>2</u>	<u>3</u>	<u>4</u>	5	
Comments Round 2	Very important. If mobile design is your interest.						
Justify here if different than majority							
39	Strong, effective production skills as well as design	1	2	3	<u>4</u>	<u>5</u>	
Comments Round 2	Summarization: Need to determine if what you created can actually be produced. This is a MUST have. So glad someone added this b/c it is essential to the success of a designer.						
40	Understand client needs, and deliver on time.	1	2	3	4	<u>5</u>	
Comments Round 2	This goes along with Item 23 and 28						
Justify here if different than majority							

Item	<u>Skill set/Knowledge</u>	Rating Scale					
	Regarding essential graphic design skill sets/knowledge, the post-secondary student will:	Least Important	Less Important	Important	More Important	Most Important	Your Rating
41	Cross platform knowledge work with Mac and PC	1	<u>2</u>	<u>3</u>	<u>4</u>	5	
Comments Round 2	More for Web design						
Justify here if different than majority							
42	Learn about licensing of images, music, video, etc. for resources for design work.	1	2	3	<u>4</u>	<u>5</u>	
Comments Round 2	This comes on the job. You do not want to get you or your client in a legal dispute. Oh yeah. Last thing you want is to get slapped with a lawsuit.						
Justify here if different than majority							
43	Understand how to effectively keep financial records and budget expenses.	1	2	3	4	5	
Comments Round 2	Always good to know, especially if you freelance. Important so you can be successful. This coincides with Items 23, 24 & 30. If you are freelancing or managing a department. Yes. I do not think that this survey applies to those.						
Justify here if different than majority							

