RESEARCH ARTICLE

Representation stigma: Perceptions of tools and processes for design graphics

David Barbarash

Horticulture and Landscape Architecture, College of Agriculture, Purdue University, West Lafayette, IN 47906, USA

Abstract
Practicing designers and design students across multiple fields were surveyed to measure preference and perception of traditional hand and digital tools to determine if common biases for an individual toolset are realized in practice. Significant results were found, primarily with age being a determinant in preference of graphic tools and processes; this finding demonstrates a hard line between generations of designers. Results show that while there are strong opinions in tools and processes, the realities of modern business practice and production gravitate towards digital methods despite a traditional tool preference in more experienced designers. While negative stigmas regarding computers remain, younger generations are more accepting of digital tools and images, which should eventually lead to a paradigm shift in design professions.
© 2016 The Author. Production and hosting by Elsevier B.V. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/).

1. Introduction

Design is a strongly personal process, and designers are often passionate about their tools. For centuries, design was taught and expressed through hand-drawn images and hand-built models, but the digital age has seen these norms shift toward new and unexpected directions. Computers, their processes, and the representations created through them have become highly controversial; experienced designers report that these technologies are unintuitive, cold, and lacking in character, whereas traditional hand methods are believed to foster feelings of warmth, personality, and malleability (Dorta, 2008; Dorta et al., 2008; Lyn and Jr., 2009; Şenyapili and Basa, 2006; Tai, 2003).

These stigmas were established when computer technology was relatively new (at least in a Moore's Law timescale) and when computers were mostly considered an isolated tool in a professional office. Digital technologies have become inherent to everyday life, and recent generations grew up with computers (in multiple forms, i.e., desktops, laptops, cell phones, etc.). Entertainment created for younger generations is often digitally generated and foster a level of comfort and acceptance different from those for older age groups. Despite these societal shifts toward digital

methods and products, design practice and education remain guided by experienced designers who maintain a perceived superiority of traditional hand-created methods.

Given that design firms are run by experienced practitioners, the stigmas and preferences of most people who did not grow up with digital technologies shape firm style and public perception through graphic outputs. Similar biases are manifested in design education, although students typically possess the time and freedom to explore their own production and representation styles. The questions that require answers are whether design across all professions is limited by people who are too set in their ways and if design professionals are in danger of being left behind by failing to adapt to an increasingly digital world.

This study measures opinions on design tool and process preferences to determine whether business practices (digitization of design) influence graphic content and processes without considering effect and perception. The study does not aim to discuss the superiority of either side, digital methods, or the value of the products created through these methods. Instead, this work assesses the established stigma in design professions and levels the playing field between toolsets to provide both processes an equal standing.

We hypothesize that a marked shift exists between students and professionals and between younger respondents and more experienced ones in terms of their acceptance and use of digital tools. Younger designers are expected to prefer digital methods, whereas older designers are expected to prefer traditional hand methods.

2. Literature review

2.1. Background

Computers have become extremely common that they are taken for granted in many aspects of modern life. However, many designers who frequently utilize their cell phones, smart televisions, and tablet computers have strong opinions on why digital products are inappropriate tools for design. Numerous studies have reported that computers are viable design tools (Dorta, 2008; Oxman, 2008; Şenyapili and Basa, 2006; Tai, 2003; Coyne et al., 2002). Nevertheless, experienced designers continue to profess the superiority of familiar traditional methods. This argument is similar to that against older technology that we accept without question today, i.e., the tractor replacing the horse-drawn plow (Dorta, 2008; Coyne et al., 2002). The changes in the thought process and representation that occur because of the shift toward the use of computers in design can be compared with Bauhaus' rejection of the Beaux Arts and the adjustment in the methods and forms it inspired (Oxman, 2008).

The digital realm introduces designers to new terminologies, methodologies, and viewpoints. Using computers in design may lead to a change in perception but not to a change in design thought. It involves new means of seeing, interpreting, and modifying the way we view and react to reality (Coyne et al., 2002). Design as a process is a discussion between art and science filtered through the lens of an individual, whether that person is a designer, an observer, a participant, or an occupant (Şenyapili and Basa, 2006). No one tool set is inherently more artistic or more scientific than others. However, designers readily assign labels to their tools at hand, thus influencing the process and ultimate product of design and graphic representation.

Hand sketching is still the required first phase of design in many schools and offices. Hand sketches are often informal and are intended to record and refine the thoughts of individual designers. The common belief is that these sketches need to be abstract, ambiguous, and imprecise to allow a designer to maintain the "flow" and "looseness" necessary to focus within a design mode of thought. These sketches are entirely personal in nature, and their ambiguity makes them difficult to use in communicating the design intent without further explanation and illustration (Kavakli and Gero, 2001). Hand sketches are lacking in value when used as standalone representations of ideas for communication with other individuals or even for the designers themselves after time have separated them from their thoughts during sketching (Dorta, 2008; Dorta et al., 2008). Such a situation is particularly true in client communication because the recipients of designed images are rarely trained in the interpretation and methods of reading graphic representations of proposed work. With design practice becoming increasingly digital (at least for the technical areas of a project) and with the ubiquity of computers and digitally produced media, whether professional bias exists against digital content and whether such perceived bias resides solely in the minds and hands of a few influential designers should be determined.

Objectively speaking, not all creative professions can create or influence the tools they wish to use in the design process. The academic and professional sectors of design professions need to continue to advocate the use of digital technologies whether for representation or fabrication, development and documentation, or administration of a project. Communication and coordination with software and hardware manufacturers are vital in expressing the needs of professional user groups (architecture, landscape architecture, interior design, graphic design, etc. as individual communities) to build tools uniquely designed for their professions (Tai, 2003).

2.2. Design process and ideation

The most creative designers can suspend rational thought and think abstractly. This mode is not self-sustaining because it requires regular reality checks to maintain a connection with the design in question. This dialogue between abstract and concrete domains is often recorded through sketching and physical modeling (Hanna and Barber, 2001; Robertson et al., 2007). Experience results in the ability to create large and fast creative moves while spending minimal time outside of a creative frame of mind (Dorta, 2008). The primary means by which designers improve their skills is by creating or analyzing other designs (Lyn and Jr., 2009). A highly experienced designer can create unique and inventive work faster than a novice can. This situation applies despite experienced designers experiencing similar difficulties in articulating or identifying