

Separating the hand from the fingers: an examination of tool use in design education

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Design, the visual solving of problems, is based on a mix of thinking and the skilled use of media. The contemporary practice of design requires a high level of knowledge in both technical skill and in design ability. Recently, a vast range of new tools have been forced into design education without a corresponding understanding of how these tools change people, their work, and their thinking. Our education process in graphic design has been based on a balance of the cognitive and representational skills of older technologies such as drawing and making. These media are based in human creation, and are derived from the work of the hand. With the new digital tools, however, the process has changed. Like design on steroids, software short circuits the process of thinking, substituting results built on [literal] sand. Design educators must develop an understanding of media effects in the design process; engage conscious limiting of media in design education; and develop a meta-cognitive awareness of media choice in design students.

1 Both business in general and graphic design professionals in specific have eagerly accepted computers as a means to increase efficiency and production. Much of the economic growth of the 1990's has been attributed to computer based productivity gains. Few graphic design firms practice today without computer assistance in the production of design. The ability to rapidly produce finished design work is valued.

It has followed that the new technology also has made significant inroads into design education. Many universities provide computer labs, many classes are offered on computer use or software; and most students have access to computers.

2 Design education, however, does not have the same goals as business but rather emphasizes the development of the mind, the improvement of skills and abilities.

Much of our educational process in design has, historically, been based on tasks that require time, thought, preparation and attention, and which hopefully lead to a well considered result. Educational tasks have often been designed to encourage concentration and deep thinking over time.

Design education can be described as active learning as opposed to the passive absorption of information through lecture or reading. Design education has and remains within a methodology of iterative making, experimenting, creation, and critique. These are cognitively challenging processes, ones that are only recently being more celebrated by mainstream education. [e.g. Krathwohl & Anderson, 2001].

Designers commonly use what is called 'distributed cognition' [Clark, 1997] in their design process, i.e. the externalizing of their thought processes. Designers make marks, adjust symbols, manipulate media, and from that manipulation and iterative design process develop new ideas. Various media have been used to inform designing, helping designers make decisions. These technologies have served as 'cognitive media', a place for the development of ideas [Hokanson, 2000].

The imperfect feedback [or "backtalk" per Goldschmidt, 1999] of media is an important component of the design process. Media as an aid to thought is a central spline of design. Media use is meant to be an easy, rapid, and cheap, perhaps discordant representation of an idea.

Inherent too, in our description of design investigation is an inclusion of a human aspect in the design; the use of the media, the use of the tool is imperfect, and each reuse adds a new, vital component; it is a live performance. As our goal in design education is the development of designers, as opposed to the production of work; production efficiency is not the principal goal in our choice of media. Until recently, the media used were technologically simple but moderately paced; inherent in production was time for reflection and thought.

3 Like many newer means of production, the software used in graphic design has a number of attributes; it speeds up the work, automates the process, and perfectly applies complex, anonymous algorithms to each task, often eliminating portions of the decision making process.

What has made it possible to routinize processes is not machinery; the computer is only the trigger. Software is the reorganization of traditional work, based on centuries of experience, through the application of knowledge and especially of systematic, logical analysis. (Drucker, 1999, p.57.)

Admittedly, the student of today does have a need to understand how to use a computer well, particularly as a means of production in the modern world. Unfortunately, we now often see computer centric design work as a shortcut to a less considered result; the image has become more important than the ideas conveyed. Production of the finished artifact has become, in many cases, more important than the exploration of learning. We recognize the problem through our teaching; students of graphic design, computer virtuosos, produce technically advanced designs that are conceptually vacant. The work, of little depth, is produced by the fingers, often independently from the mind.

Why does this matter? If our sole concern were the development of aesthetically pleasing or technically proficient results, then not at all.

4 As design educators, even those that work extensively in technology rich environments, we must recognize the need to evaluate our use of media, and to concentrate first on the cognitive effort instead of the technological effort. We must consciously consider how media affect and enable thought; concurrently, as educators, we must examine how media may discourage reflection and deeper thinking, as highly developed tools often retard development of the higher order skills necessary for design through the facile production of highly finished results.

The balance between media and thinking is critical. The relationship is one of symbols and their manipulation; media [the technology for expressing, creating and communicating symbols] both enables and constrains the designer. Through the characteristics of a media, new ideas develop, different concepts are made clear [or murky], and the limits of the media can force a new strength, quality of ideas, aesthetics, and thought.

Logically then, to effectively teach design, we might need to consciously force the use of a lower level technology. This may mean a pencil in lieu of a computer, hand collage instead of Photoshop, being dirty instead of digital; it would free the mind for the development of thought. We must begin to more intentionally select design process media as part of our assignments; e.g. choosing paper or computer when best suited to the assignment and developmental level of our students. Bound by the parameters of a limited tool, the use of the mind can concentrate on the more finely grained elements of the task at hand.

Inherent in this redirection of design education is the development of conscious media choice among learners.

5 As designers, we can recognize the need to select our tools with care as they shape the outcome; as educators we similarly recognize that the media selected also shape the outcome, in this case new designers. And finally, we should know that our learners must similarly develop this critical thinking ability; to monitor and select appropriate media.

Our charge is important; the media with which we educate is related to thought, to humanity, to skill, to craft, cognition, and reality. The designers we educate will, in the end be found successful through their thinking skills, often developed by the hand, not their skills in digital representation.

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