

Design Thinking in a Graduate Design Studio: Personal and Pedagogical Factors

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Abstract: Potential factors that affect the development of design thinking are posed by scholars in a variety of design disciplines, but an understanding of these factors from the student perspective is lacking. I examined the experiences of first-year graduate design students, including reported factors that affected the student's development. Factors that emerged included the role of interpersonal relationships, critique, cultural and experiential differences in team composition, and the role of individual versus group work.

Design pedagogy—and by indirect extension, the studio design approach—has a long history, spanning from the early methods utilized at the École des Beaux-Arts in the late 19th century (Kuhn, 2001) to the present day. While these traditional studio methods have adapted over time through the differentiation of design disciplines and pragmatic applications of technology (Findeli, 1990), the core blending of functional and structural elements in a problem solving orientation have been consistent across a wide variety of design disciplines (Kuhn, 2001; Brandt, et al., 2008). While a core design pedagogy has been widely implemented (Shulman, 2005), the role of the pedagogy in moving a student toward mastery, linked to a change in the way they think about design (Siegel & Stolterman, 2008; Cross, 2011), is not well understood. In this study, I evaluated the experiences of first-year design students, in conjunction with the role of faculty in creating a discipline-specific design pedagogy, to understand factors that affect their development of designerly thinking.

A literature review was conducted to establish a baseline of design pedagogy and potential factors that affect the designerly thinking of the design student as they transition from novice to expert designer. The identified literature includes the application of this signature pedagogy in a variety of design disciplines, including: computer science, graphic design, instructional design, architecture, and human-computer interaction. From the resulting identified literature, emergent candidate themes of factors that are informed by design pedagogy were identified (see Table 1). These emergent themes, developed and supported by related literature, form the tentative outline of potential factors that was used as one source of categorization in the analysis of interview data.

Environmental	Social	Formative	Evaluative
Private and public space Contrast to traditional classroom space Unfamiliar tools and norms Complexity of technological tools	Willingness to give critique Willingness to receive critique	Personal design knowledge Personal process Problem solving behaviors	Public critique and feedback Self-reflection Peer and mentor support

Table 1. Factors affecting students as identified in the design literature.

While each of these emergent categories of factors and associated elements are helpful in understanding an effective design studio, the core of the design studio is the evolving design student. As Siegel and Stolterman (2008) note, this transformational process to designer from non-designer is characterized by the penetration through a variety of barriers. It is through the overcoming of these barriers that individual design knowledge and process is developed, thereby giving the individual student the intellectual tools and practical experience to think in a designerly way. Design thinking is primarily constructive in nature, addressing ill-defined problems in a solution-focused problem solving orientation (Cross, 1982). Shaffer (2007) describes an effective design learning environment as a “coherent system of activity,” (p. 100) not a collection of strategies or procedures that are only tangentially related. It is through this systems-view of design pedagogy that the importance of common elements such as social interaction, evaluation, and the creation of individual design knowledge becomes evident.

This current study is exploratory in nature, and represents an effort to understand the factors that influence the development of design thinking *from the student perspective*. Data have been collected from six graduate design students in a Human-Computer Interaction design (HCI/d) program. Each participant was interviewed during their first semester of graduate design education, including a series of three approximately one-hour interviews completed during the eighth, twelfth, and fifteenth weeks of the fall semester. In addition, student reflections posted on a course blog throughout the semester were included in the data analysis process. Two faculty members were interviewed for approximately one hour to gain additional pedagogical context.

Data collected from student and faculty interviews was analyzed using the constant comparative method and elements of critical theory analysis. A first round of analysis was conducted on the student interview data in isolation by time, dividing each set of interview transcripts from a specific interview in the longitudinal sequence (e.g., all eighth week interviews) into utterances representing a complete thought or idea. The utterances were then assigned to one or more categories that emerged from the data (Glaser & Strauss, 1999). A second round of analysis was conducted on the sequence of interview data and related emergent categories for each individual participant, tracking changes in emergent codes over the period of time represented by the three interviews. My themes were informed by but not limited to the emergent themes addressed in the literature review. New themes that have emerged relate to interpersonal relationships in the studio, cultural and experiential differences in team composition, and the role of group work versus individual work in the development of design thinking. Implications of these student experiences in the context of design education will be discussed, including personal factors relating to the development of design thinking and teamwork that are currently underrepresented in the design pedagogy literature, as well as opportunities for further research.

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