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This article describes the *studio model*—a cultural model of teaching and learning found in U.S. professional schools of art and design. The studio model includes the pedagogical beliefs held by professors and the pedagogical practices they use to guide students in learning how to create. This cultural model emerged from an ethnographic study of two professional schools of art and design. A total of 38 professors from a total of 15 art disciplines and design disciplines were interviewed and their studio classes were observed. A grounded theory analysis was used to allow the studio model to emerge from audio recordings of interviews and video recordings of studio classes. The model was then validated by 16 different professors at six additional art and design schools. The studio model was found to be general across art and design disciplines and at all eight institutions. The central concept of the studio model is the creative process, with three clusters of emergent themes: learning outcomes associated with the creative process, project assignments that scaffold mastery of the creative process, and classroom practices that guide students through the creative process.

INTRODUCTION

Creativity is a core element of professional practice and has been identified as an important 21st-century skill (Robinson, 2001; Schön, 1983; Trilling & Fadel, 2009). Many educators and policymakers have called for schools to deliver creative learning outcomes (Council on Competitiveness, 2005; Organisation

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for Economic Co-operation and Development, 2008; Wagner, 2012). And yet learning scientists do not have a ready answer to the following question: What pedagogical practices lead to creative learning outcomes? To help answer this question, I conducted an ethnographic study to identify the pedagogical beliefs and practices of professors in U.S. schools of art and design. I hypothesized that creativity would be an important learning outcome in these schools and that professors' pedagogy would be designed to lead to creative learning outcomes.

My first research question is this: Is creativity an intended learning outcome in art and design schools, and, if so, what conception of creativity is being taught and learned? My second research question is this: What pedagogical beliefs and practices are found in these colleges and universities, and are they designed to lead to this conception of creativity? My third research question is this: To what extent are these creativity conceptions and creativity pedagogies common across art and design disciplines and across different schools? An understanding of how creativity is conceived and taught in art and design schools would be of interest to creativity researchers, to scholars who study art and design, and to kindergarten–Grade 12 (K–12) educators who desire to foster creative learning outcomes.

Creativity research presents four different conceptions of creativity: as a personality trait, as self-expression, as a moment of insight, and as a process of working. Any one of these might be found in art and design schools, and each of the four conceptions has different implications for teaching and learning.

Creativity as a Personality Trait

When modern creativity research originated in the 1950s, a central goal was to develop paper-based personality tests designed to assess a person's creative potential (Kaufman, Plucker, & Baer, 2008). The first creativity tests, most prominently the Torrance Tests of Creative Thinking, originated in the 1950s and 1960s, and creativity tests continue to be used in admissions to gifted and talented programs (Kaufman, 2009, pp. 144–147; Renzulli, Smith, White, Callahan, & Hartman, 2001). If art and design professors held to a personality trait conception of creativity, they would be likely to believe that creativity is relatively fixed. Rather than creativity per se, their pedagogy would be focused on tools to help realize a student's preexisting creative potential: discipline-specific techniques and skills, the history of prior work in that discipline, and theoretical and critical frameworks relevant to work in that discipline.

Creativity as Self-Expression

Creativity is the expression of an inner voice or of the subconscious. This inner creativity is often repressed by the conscious mind and blocked by fear or doubt. The process of becoming creative is one of recovery, self-acceptance, and

transformation. This conception is associated with Romanticism (Sawyer, 2012, pp. 23–24) and Freudian psychoanalysis (Sawyer, 2012, pp. 22, 82–83). In this conception, creativity cannot be taught directly but perhaps can be released by removing conscious blocks and helping the creator to discover his or her inner voice. A popular representation of this conception can be found in *The Artist's Way* (Cameron, 1992).

Creativity as a Moment of Insight

Creativity is the generation of a novel idea or solution in a sudden moment of insight (Csikszentmihalyi, 1996; Lubart, 2001, pp. 297–298; Sawyer, 2012). The insight conception originated with Gestalt psychologists, who proposed that an insight occurs as a result of a sudden restructuring of the mind. More recently, cognitive psychologists have studied how insights are generated, for example through mental combinations and analogies (Sawyer, 2012, pp. 107–122). In the insight conception, pedagogy would involve exercises to enhance the cognitive processes associated with idea generation, such as divergent thinking, analogy, and remote association.

Creativity as a Process

Creative works are the outcome of an extended process of making. In this conception, pedagogy would be focused on the work processes associated with the generation of successful creative work. Recent empirical studies have documented that successful artists and designers engage in an iterative process (Halverson, 2013) and that creativity resides in the small ideas that occur frequently through this process (e.g., Finke, Ward, & Smith, 1992; Gruber, 1988; Mace & Ward, 2002; Mumford, Mobley, Uhlman, Rieter-Palmon, & Doares, 1991; see additional citations in Lubart, 2001, p. 304; Sawyer, 2003, pp. 28–29).

To address the three research questions, I conducted ethnographic studies of two professional schools of art and design. I interviewed 38 professors in 15 different art and design disciplines. Using a grounded theory methodology, I identified a single cultural model of teaching and learning shared by the 38 professors, the 15 art and design disciplines, and both institutions. I call this the *studio model*. The studio model was then validated using a structured interview with art and design professors at six additional schools.

The studio model contains 45 themes grouped into three clusters (see Appendix A):

Cluster 1: Learning outcomes (14 themes)
Cluster 2: Project assignments (21 themes)
Cluster 3: Classroom practices (10 themes)

The 14 themes of Cluster 1 answer the first research question: Is creativity an intended learning outcome, and, if so, what conception of creativity? This study found that creativity, conceived of as a creative process, is the most important learning outcome of art and design education. Professors do not discuss or teach the other three conceptions of creativity—the personality view, the self-expression view, or the insight view—and there is no evidence that professors consider them to be among their intended learning outcomes.

The 21 themes of Cluster 2 and the 10 themes of Cluster 3 provide a highly articulated answer to the second research question: What pedagogical beliefs and practices are found in art and design schools? This study found that project assignments and classroom practices are designed to lead to creativity, conceived of as mastery of the creative process. The other three creativity conceptions do not appear in these 31 themes; there is no evidence that project assignments or classroom practices are aligned with any of the other three conceptions of creativity.

In response to the third research question, this study identified a single conception of creativity and a single pedagogical model. Across the 15 disciplines studied, the 54 professors, and the eight institutions, I found the same 45 themes. Among professors of art and design, creativity is conceived of as an iterative process of making, and the primary goal of art and design education is mastery of the creative process.

RELATED STUDIES OF CREATIVITY, DESIGN, AND ART EDUCATION

Creativity Education

When modern creativity research began in the 1950s and 1960s, most creativity researchers were personality psychologists. The field focused on developing assessments to identify exceptionally creative individuals and documenting the personality traits associated with high levels of creativity (e.g., C. W. Taylor, 1959). Although much of this research treated creativity as a stable trait, a few researchers—notably Paul Torrance—believed that creativity could be taught, and developed creativity training programs (Torrance, 1972). In the decades since, a variety of creativity training programs have been developed for K–12 students, including the Productive Thinking Program, the Cognitive Research Trust, and the Purdue Creative Thinking Program (Sawyer, 2012, pp. 410–413). Thousands of U.S. students are involved in extracurricular activities that emphasize creativity, such as Odyssey of the Mind, InventTeams, and the First Robotics Competition.

There is some evidence of limited success in some of these programs. A 2004 meta-analysis (Scott, Leritz, & Mumford, 2004) found some evidence of success

in programs that focus on the development of creativity-related cognitive skills. In another study of these programs, Nickerson (1999) found some evidence of success in programs that continue over a long time period but not in shorter term programs. He concluded, "A clear, unequivocal, and incontestable answer to the question of how creativity can be enhanced is not to be found in the psychological literature" (p. 407; see also Wallach, 1988).

Design Education

In design studies, *design* is defined as "the conception and realisation of new things" that have utility or value for a user, client, or customer (Cross, 1982, p. 221; see also Davis, Hawley, McMullan, & Spilka, 1997). The nine design disciplines included in this study are advertising, architecture, communication design, foundations, graphic design, industrial design, two-dimensional design, typeface design, and typesetting (see Table 1). Empirical studies of design practice have revealed that design creativity is rarely linear (Cross, 1992, 1997, 2011; Lawson & Dorst, 2009). The design process starts with a tentative but ill-formed goal in mind; the creator works in an improvisational fashion, being attentive to unexpected opportunities that emerge from working with the medium (Halverson & Sheridan, 2014; Kafai, Fields, & Searle, 2014). The core elements

TABLE 1
Disciplines of Professors Interviewed and Subjects of Classes Observed at Each Research Site

Savannah College of Art & Design	Washington University
Fine arts	
Illustration (1)	Illustration (3)
Painting (3)	Painting (2)
Sculpture (4)	Sculpture (2)
Photography (1)	Printmaking (1)
	Book making (1)
Design	
Architecture (2)	Architecture (3)
Foundations (4)	Foundations (1)
Advertising (2)	Two-dimensional design (1)
Graphic design (2)	Communication design (1)
Typesetting (1)	Typeface design (1)
Industrial design (2)	
Total	
10 disciplines, 22 professors	10 disciplines, 16 professors

Note. The number of professors is shown in parentheses. Disciplinary affiliations and class subjects are as defined by each institution. The study included a total of 15 different disciplines and 38 professors.

of the design process are its "spiral, cyclical" and "opportunistic" nature (Cross, 1992, pp. 331–332). Design researchers have identified the common aspects of an iterative process that begins with exploration, ideation, and finding and describing a problem; goes through the construction of drafts, sketches, and prototypes; and is followed by analysis and reflection on these early externalizations, with repeated and iterative cycles through this process (Cross, 2011; Halverson & Sheridan, 2014, p. 635).

There have been only a few empirical studies of design pedagogy beliefs and practices. The authors of these few studies note the lack of such research; for example, Oh, Ishikazi, Gross, and Do (2013) concluded that "theoretically or empirically informed discussions on design pedagogy are uncommon" (p. 303; see also Lee, 2009). An exception is architecture education, which has been the focus of several empirical studies (e.g., Balfour, 1981; Ockman, 2012; Oh et al., 2013; Schön, 1985).

Art Education

For purposes of this study, *art* is defined as the activities and the works generated in the six visual arts disciplines incorporated in this study, which are illustration, painting, photography, printmaking, sculpture, and book making (see Table 1). The primary contrast to design is that in art there is no user, client, or customer; "art responds to personal, subjective criteria, but design products must perform for people" by accounting for "a wide variety of audience and user behaviors" (Davis et al., 1997, p. 3). There have been only a handful of empirical studies of artistic production; like studies of the design process, these studies suggest that art making is a nonlinear process in which ideas and images emerge from the process of working with materials (Botella, Zenasni, & Lubart, 2011; Getzels & Csikszentmihalyi, 1976; Mace & Ward, 2002; Sawyer, 2016).

There has been remarkably little research on the pedagogical practices that occur in art classes at the university level (as noted by Harwood, 2007; Salazar, 2013). University arts educators themselves note that there has been almost no research on their pedagogy:

> What disoriented us was how little attention was paid to the nuts and bolts of art teaching: the effectiveness and applicability of certain classroom strategies, coping mechanisms for the psychological toll of being a diligent instructor, ways to teach a subject that resists straightforward explication. (Paper Monument, 2012, p. 122; see also Elkins, 2012, p. 2)

Learning Sciences Studies of Art and Design

Consistent with this lack of research by art and design scholars there has been very little learning sciences research into professional visual arts pedagogy and

practice. A few learning scientists have examined architecture studios (Cox, Harrison, & Hoadley, 2009; Shaffer, 2003); for example, Shaffer (2007) conducted an ethnographic study of an architecture studio class at MIT and identified links between the practices he observed and science, technology, engineering, and mathematics education innovations such as the Geometry in Design project and the Middle School Math through Applications Program. Several learning scientists have applied concepts from design practice to science, technology, engineering, and mathematics education, although without themselves publishing studies of professional design practice or design education (e.g., Cossentino & Shaffer, 1999; Hmelo, Holton, & Kolodner, 2000; Kolodner et al., 2003; Lasky & Yoon, 2011).

In contrast to the dearth of studies of higher education art and design pedagogy, there is a long history of studies of primary and secondary arts education, as represented in handbooks (e.g., Bresler, 2007) and in journals (e.g., *Art Education Journal*). Several influential studies have come out of Harvard's Project Zero. Hetland, Winner, Veenema, and Sheridan (2007) observed the classes of five teachers at two secondary schools in the Boston area. They focused on identifying the learning outcomes taught by these five teachers, which they called "studio habits of mind." They reported how these learning outcomes were taught in three pedagogical settings: demonstration/lecture, student work, and critique. In another Harvard study, Seidel, Tishman, Winner, Hetland, and Palmer (2009) studied what K–12 educators consider to be quality arts education, drawing on interviews with more than 250 people and site visits to 12 community-based programs. They identified several learning outcomes that educators themselves associate with high-quality arts education. Although both of these publications described some broad aspects of studio pedagogy at least briefly, it was not their central focus, and the potential links between these K–12 studies and higher education art pedagogy remain unexplored.

A related set of studies has examined learning sciences–aligned practices in informal K–12 arts programs outside of schools: in museums, community centers, and after-school programs (e.g., Chávez & Soep, 2005; Kafai & Resnick, 1996; Peppler, 2010). In a review of this work, Halverson and Sheridan (2014) concluded that learning in the arts is different from learning in other disciplines in three ways: Learning about representational choices is critical, meaning and representation are combined, and identity and culture are embedded in art making (p. 626).

The current study extends previous studies of creativity education and K–12 arts education by studying professional visual arts education in higher education institutions. It extends learning sciences applications of design practices by conducting a rigorous empirical study of the pedagogical practices used in professional design programs. Whereas the few prior studies of higher education

focused on a single institution or class, this is the first study to examine a broad range of professors, classes, and disciplines. Finally, it is the first joint study of both art and design pedagogy, with the goal of identifying shared beliefs and practices across both art disciplines and design disciplines.

CULTURAL MODELS OF TEACHING AND LEARNING

Cultural model theory addresses a continuing tension in the learning sciences: how to integrate cognitivist findings at the individual level of analysis with descriptions of situated social practices at the sociocultural level of analysis (Nathan & Sawyer, 2014). In the 1980s, cultural anthropologists began to work with cognitive scientists to explore how individual cognition might be linked to the situated social practices shared in a community. These interdisciplinary collaborations resulted in the theory of cultural models (Holland & Quinn, 1987; Shore, 1996). A *cultural model* is "a cognitive schema that is intersubjectively shared by a social group" (D'Andrade, 1987, p. 112). This line of scholarship was closely related to anthropological studies of situated learning that contributed to the sociocultural turn in the learning sciences in the 1980s (see Greeno & Nokes-Malach, 2016).

Cultural model theory has been used to explain coherent systems of beliefs and practices in professional communities, including teachers (e.g., C. Strauss & Quinn, 1994). For example, DeZutter (2008) studied the cultural model of teaching and learning in two community-based arts organizations that offered classes in visual arts, dance, and theater. Cultural models research is related to studies of teaching in communities of practice: See Horn (2005) on a math department at a high school; Little (2003) on teacher workplace learning; and the teacher beliefs literature, which examines "implicit theories" and "lay theories" of teachers (DeZutter, 2008, pp. 15–23; E. W. Taylor, 2006; E. W. Taylor & Caldarelli, 2004; Wenger, 1999). In a teaching community of practice,

> The participants … are able to articulate quite a bit regarding what they believe, assume, and understand about teaching and learning.… At the same time, these models are detailed and complex and participants cannot be expected to articulate an organized view of their models in full. (DeZutter, 2008, p. 63)

Cultural models typically have substantial implicit elements as well as formal, explicit, and declarative knowledge (D'Andrade, 1995).

Cultural model theory is appropriate for this study because the goal is to identify the explicit and implicit pedagogical beliefs and practices shared in this community of practice, the "presupposed, taken-for-granted models of the world that are widely shared by the members of a society and that play an enormous

role in their understanding of that world and their behavior in it" (Quinn & Holland, 1987, p. 4). In cultural model research, the goal is to understand "what [people] must know in order to act as they do, make the things they make, and interpret their experience in the distinctive way they do" (p. 4). Cultural model theorists argue that explicit beliefs can be identified through interviews with participants. In addition, many implicit beliefs can be identified through interview questions that elicit taken-for-granted beliefs and assumptions that are rarely discussed explicitly. But many aspects of a cultural model are not consciously available to participants; elements of a cultural model are "often transparent to those who use it" (Hutchins, 1980, p. 12). For a full understanding of tacit beliefs and practices, researchers often undertake an ethnographic study to observe situated social practices.

METHODOLOGY

Research Sites

I conducted ethnographic studies of two professional schools of art and design: the Savannah College of Art & Design (SCAD), a free-standing art and design college; and Washington University's Sam Fox School of Design & Visual Arts (WU), an art and design school embedded within a comprehensive research university. These are very different institutions. SCAD is not ranked in the top 100 schools of art; WU's art programs are ranked in the top 20 (U.S. News and World Report, 2016). SCAD has an explicit focus on professional preparation for creative careers, with majors such as advertising and industrial design; WU tends to focus less on career preparation and more on connections with social theory, engagement with the prior history of the discipline, and arts practice as a form of research.

These two research sites were chosen opportunistically. The study began when I was invited to be a visiting professor at SCAD during a 2010 sabbatical leave. I received permission from the university administration to conduct professor interviews and observe studio classrooms. When I returned to my position at WU, I received permission to conduct a similar study. At each institution I interviewed professors and observed studio classes in 10 disciplines, for a total of 15 different art and design disciplines (see Table 1).

I was introduced to the professors as a colleague at their institution and as someone unfamiliar with art and design schools and untrained in any art or design discipline. The 38 participants were selected by their deans and their department chairs for their recognized abilities as excellent and experienced teachers; the average years of teaching experience was just more than 14 years. These different sites and disciplines were chosen to identify the broadest possible

range of beliefs and practices, a purposeful sampling technique known as *maximum variation sampling*. As Patton (1990) wrote, "Any common patterns that emerge from great variation are of particular interest and value in capturing the core experiences and central, shared aspects" (p. 172).

Data Gathered

I gathered two types of data at each institution. First, open-ended interviews were conducted with professors, beginning with the question "How do you teach students to be creative?" These interviews were designed to elicit aspects of the cultural model that are consciously available even if rarely discussed in the community. The following interview questions were developed in advance. Because of the open-ended nature of the interviews, questions were often added spontaneously to pursue lines of discussion raised by participants, and not all questions were asked in all interviews.

- How do you teach students to be creative?
- Do you have to be exceptionally creative to be an exceptional student?
- How do you define creativity and originality?
- Can you think of someone who was your best student?
- What is your definition of the quality of a work?
- How important is originality to your definition of creativity?

Second, observations of studio classroom interactions were conducted to identify implicit and tacit elements of the cultural model.

Interviews were audio recorded and observations were video recorded, resulting in a total of 55 hr of data (see Table 2). Interviews ranged in duration from 38:07 to 1:23:52; videos ranged in duration from 27:07 to 2:14:23. All audios and videos were transcribed. In each transcript, short stretches of talk were grouped into meaning units: two- to five-sentence groupings of talk on the same topic.

Additional data included photos of student work, professor and student websites, field notes, and copies of curriculum materials provided by professors.

Grounded Theory Methodology

Many elements of a cultural model are available to participant awareness, and these can be elicited in interviews. But cultural model theory predicts that conscious participant understandings are incomplete; the cultural model shared in a community of practice contains not only knowledge that "is under conscious and voluntary control" but also knowledge that is "less available for introspection and articulation" (Quinn & Holland, 1987, p. 8). Because a cultural model is

TABLE 2
Data Gathered

Site	Instructors n	Class Observations n (Duration[a])	Interviews n (Duration[b])
Savannah College of Art & Design	22	7 (9:37)	25 (19:49)
Washington University	16	9 (10:03)	18 (15:27)
Total	38	15 (19:40)	43 (35:16)

Note. Some professors were interviewed or observed more than once. Total data recorded, transcribed, and coded = 54 hr, 56 min.
[a]Total duration of video data given as hh:mm. [b]Total duration of audio data given as hh:mm.

intersubjectively shared in a community of practice, "a great deal of information related to the folk model need not be made explicit" (D'Andrade, 1987, p. 113).

This leads to a methodological problem: how "to reconstruct the cultural models people use but do not often reflect on or explicitly articulate" (Quinn & Holland, 1987, p. 14). To elicit both the explicit and the tacit aspects of the cultural model, and to identify and construct a more complete cultural model, I used a grounded theory methodology. A grounded theory methodology is appropriate when it is necessary "to interpret participants' tacit meanings" and to relate these in an emergent framework (Charmaz, 2014, p. 115).

The methodology was designed to identify the themes (also called *codes*) that comprise the cultural model as well as the connecting relationships that form a coherent framework (Charmaz, 2014, pp. 114–115). The constant comparative method was used to identify themes that emerged from the interviews and observations in the following three stages (Glaser, 1978, 1992; Glaser & Strauss, 1967; A. Strauss & Corbin, 1990).

In the first stage, the audio and video transcripts from each institution were analyzed separately to identify the cultural model of teaching and learning at each institution. All meaning units related to the research questions were coded to develop an initial list of themes. Because the third research question of the study was to identify pedagogical beliefs and practices found in both art and design, a theme was only added to the model if at least one meaning unit was coded in both an art discipline and a design discipline. At each institution, constant comparison, including reanalyzing all transcripts with these initial themes, resulted in the integration, or merging, of pairs of initial themes (Glaser & Strauss, 1967, pp. 108–109) until the analysis reached saturation (Charmaz, 2014, pp. 212–213; Corbin & Strauss, 2008, pp. 143–149). This process resulted in a cultural model with 50 themes at WU and a cultural model with 51 themes at SCAD, with each of these themes found in at least one art discipline and at least one design discipline.

In the second stage, the two cultural models were compared to allow the emergence of a single shared cultural model containing themes that were found at both institutions. The initial comparison resulted in the identification of 69 distinct themes: 32 themes were found at both institutions, and 37 themes were found at only one institution (18 only at WU and 19 only at SCAD). At each institution, well over half of the themes matched those of the other institution, which suggested that the two cultural models were fairly similar.

The third stage examined to what extent these 18 and 19 unmatched themes were related. Constant comparison was used to recode the full transcribed data set using all 69 themes; in this new coding pass through the data, many additional meaning units were coded. This recoding stage resulted in the merging and dividing of themes as follows: (a) Themes that were overly narrow in definition —those that had only a few meaning units coded—were merged with a related theme, and the newly merged theme was given a broader definition that incorporated both; and (b) themes that were overly broad in definition—those that coded a large number of meaning units and seemed to encompass two distinct themes—were divided. Four matched themes were omitted because they were not relevant to the goals of the study.

After this third stage, a set of 71 themes remained that were found in both art and design disciplines and at both institutions. None of the original 69 separately coded themes were omitted from the final shared cultural model; all were able to be merged and recoded in the third stage.

The 71 emergent themes fell into six clusters:

- Learning outcomes
- Project assignments
- Classroom practices
- Misconceptions of incoming students
- Perceptions of high school art instruction
- Assessment

Three of the six clusters (misconceptions, high school programs, and assessment) were not closely related to the research questions and were trimmed from this analysis (Corbin & Strauss, 2008, pp. 104–113; A. Strauss, 1987, p. 36). This resulted in a cultural model with a total of 45 themes in three clusters, which I call the *studio model* (see Appendix A). The three clusters in the studio model are as follows:

1. *Learning outcomes* (14 themes): Each of these themes represents a subcomponent of the primary learning outcome, mastery of the creative process.

2. *Project assignments* (21 themes): Each of these themes captures an aspect of curriculum and project design.
3. *Classroom practices* (10 themes): Each of these themes captures a situated social practice, involving both professor and students, that is designed to help students master the creative process.

Validation Interviews

Sharing the emergent cultural model with members of the community, or member checking, is considered to be a validation complement of a grounded theory (Corbin & Strauss, 2008, pp. 113, 273; Saldana, 2013, pp. 35–36). After the 45 themes had emerged, they were used to develop a structured interview with 45 statements, one for each theme. Respondents were asked to rate their agreement with each statement from 1 (*definitely do not agree*) to 5 (*definitely agree*). Because the convenience sampling used to select the two schools might have limited the generalizability of the findings, the validation interview was conducted at six additional institutions, for a total of 22 professors in both art and design disciplines:

- Six professors at WU who were originally interviewed: two in art and four in design
- A single professor at each of the following four institutions: a design professor at North Carolina State University, an art professor at the University of North Carolina, a graphic design professor at Arizona State University, and a design professor at the University of Southern California
- Eight professors of art at The School of the Art Institute of Chicago
- Four professors of design at the California Institute of the Arts

For each theme, the 22 responses were averaged to compute a validation interview score, and these are reported in Appendix A.

FINDINGS: THE STUDIO MODEL

The 45 themes were found at two different institutions in 15 art and design disciplines and were confirmed in validation interviews at six additional institutions with both art and design professors. The average of all validation interview scores for all 22 interviews and all 45 themes was 4.3 on a 5-point scale. By discipline, the average validation interview scores were 4.3 for the 11 fine arts professors and 4.3 for the 11 design professors. When the 22 validation interview scores were averaged for each theme, 33 of the 45 themes received a high

validation interview score of 4 or above on a 5-point scale, nine received a moderately high score between 3 and 4, and three received a score below 3. Cultural model theory predicts some degree of variation among members of a community: Models "are transformed as individuals reconstruct their own mental versions of socially available forms" (DeZutter, 2008, p. 47). These validation interview scores indicate some variability but are high overall, and the interviews validate the results of the grounded theory methodology.

The generality of the studio model provides an answer to Research Question 3: To what extent are creativity conceptions and creativity pedagogies common across disciplines and institutions? These data show that the studio model's creativity conceptions and pedagogies—the 45 themes and the three clusters— are found in both art and design disciplines and across multiple institutions.

Quotations from interviews and excerpts of classroom dialogue give the professor's discipline and institution. Names are used for those professors who gave written permission to be identified.

Cluster 1: Learning Outcomes (14 Themes; Themes 1–14)

The first research question is this: Is creativity an intended learning outcome in art and design programs, and, if so, what conception of creativity? The 14 themes in Cluster 1 demonstrate that the most important learning outcome is the process conception of creativity. Creativity is a deliberate process that consistently leads to successful creative outcomes. Patricia Olynyk, a professor of art at WU, told me, "Art making in this program comes about through very rigorous, critically engaged processes."

Students are scaffolded through a creative process that is iterative and non-linear. The process does not begin with a creative insight; instead, ideas emerge from working with the materials of the medium. It is best if creators work without a predetermined conception of the final outcome so that the final work emerges from the process. The process is open ended, and yet creators need to learn how to make decisions and focus as they experiment and discover their own way through the process. These experiments often lead to dead ends, requiring a reexamination to find a new way forward. The creative process is aided by constant articulation of the process under way and reflection on how the process is unfolding; articulation and reflection lead to a more advanced ability to see and think about creative work.

There is no evidence for the other three conceptions of creativity—the personality, self-expression, and insight conceptions. Artists and designers cannot depend on inspiration in a professional career; that would depend on them getting lucky and often results in them getting stuck. Professors want students to learn a creative process that consistently leads to good results. In a two-dimensional design studio class at WU, professor Jeff Pike had this exchange with a student

while the rest of the class was gathered around listening. The student has pinned 20 thumbnail sketches on the studio classroom walls (studio walls are usually covered with cork or tack board) for an interim review called a *pinup*:

Professor Pike (to student):	What do you do when you have a situation when you have a pinup, and you have to begin with, "All these suck." How do you get out of it?!
Student:	That way, when you like it, I'm like, "Uh. It's going to suck."
Pike:	What you need, you need a strategy for getting past that point.
Student:	I don't know.
Pike (to class):	Well. Okay. This is a pretty important point, actually. The thumbnails are the beginning, and we always try to generate *lots* of thumbnails, so that we have *lots* of potential ideas, so that we can allow one idea to suggest other ideas. And even bad ideas can in fact suggest better ideas.

In addition to the shared themes of the studio model, each program has discipline-specific learning outcomes: to master a core set of underlying technical skills (themes 11, 12, and 13), to be familiar with the prior history of work in the discipline and of what contemporaries are doing (theme 10), and to understand how to communicate with an audience or viewer (theme 8). And yet professors in all disciplines believe that these discipline-specific learning outcomes are best learned while engaging in the creative process (theme 13). Professors reject a process of learning that begins with prerequisite lower level technical skills, with higher level skills taught later: creativity, problem solving, and critical thinking (see also Hetland et al., 2007, p. 33, on high school art instruction). As Douglas Dowd, a professor of illustration at WU, said to me, "If I ask the question 'What should I cover?' I'm already screwed." In studio classes, I saw many examples of techniques being introduced opportunistically, such as this exchange between a student and Ron Leax, a sculpture professor at WU, concerning the student's sculpture in process. Professor Leax and the student are standing side by side; Leax speaks while holding the student's sculpture: "Okay. So here's a technique/I want you to fool around with, you know, when you're trying to get this kind of/ effect [shows the technique]. See?"

Students need to learn how to do research in their discipline and how to react to what has been done before (theme 10). But professors encourage students to engage in the creative process first—making works, solving problems, and following their own path—and then ask them to look at precedents as they become relevant. Works by other artists are used as "examples to push to the surface the issues that the students think are important in their own work"

(Patricia Olynyk, professor of art, WU). In studio classes, I saw many examples of professors directing students to precedents opportunistically, as when this SCAD painting professor describes to the whole class how she had suggested that a student seek out a contemporary artist to help the student better understand what she might do next on her portrait painting in progress:

> At the very end of class, for a few minutes after class, [the student] was still working, so I pulled up an artist named Ann Harris that one of my friends had shown me. She's a portrait artist that lives in Chicago …

A few minutes later, to a different student, this same professor suggested a different precedent in response to how her work was developing: "But you could also think about, you know, in Seurat's paintings when he's using pointillism and he paints a border …"

Many participants speak of the importance of learning how to see (theme 7). Being able to see a work enables students to discern the creative process that was followed in generating the work—how and why certain decisions were made in the process of generating the work. University of North Carolina painting professor Beth Grabowski told me during her validation interview that "students are learning how to look at things … these students will never look at things the same way." Using identical wording, a WU illustration professor also said "those students will never look at things the same way." In a panel critique session in Catalina Freixas's architecture class at WU, an external reviewer said the following to a student:

> You draw it as if it exists nowhere. Do you see?! So you're not understanding the most important thing about it. It's just a way of seeing. And once you see it, you'll always have it. But if you don't see it, you'll never have it.

Beginning students have difficulty seeing at first; instead, they focus on the visible artifact they are generating. But seeing requires that they learn to see the negative space formed by what is visible (theme 9). Most viewers are not consciously aware of how these negative spaces impact them; artists, designers, and architects have to learn how to see these spaces and intentionally create them. For example, in typeface design, *negative space* refers to the blank space between successive letters; in architecture, *negative space* refers to the three-dimensional space created by the structure, the spaces that people occupy. Professors guide students away from a focus on what they have drawn or built to a focus on the space the object creates, as when SCAD illustration professor Ruben Salinas advises a student who is designing and illustrating a chair: "Think of that chair, as uh in a box. So don't think about the chair. Think about the box that contains the chair."

Connected to learning how to see, professors also describe how to think as an important learning outcome: a form of critical thinking that is closely linked to the creative process (theme 6). When a student generates good work, "basically what they were doing is just following a way of thinking" (Scott Thorp, sculpture, SCAD). The desired learning outcome for both art and design education is not for students to make impressive objects but rather for them to learn how to think through the creative process. Sculptor Ron Leax (WU) told me, "The point of the class is not to build a thing, but how you think when you're building. The thing they make is only the carrier, you know, what manifests their thought. So I don't care what they build." Heather Corcoran, in a communication design class, said something very similar to a student: "The most important thing for you as a designer is to be able to conduct an investigation like that. That's what I mean when I say I don't really care about the illustration."

Rejection of the Other Three Conceptions

The other three creativity conceptions—personality, self-expression, and insight—did not emerge from the grounded theory methodology. And in fact, many of the professors explicitly reject these three conceptions, saying that they are inconsistent with creative practice in art and design.

The Personality Conception.   Several professors reject the personality conception of creativity, that artists and designers have a unique talent or predisposition that prepares them to succeed in creative professions. They believe that anyone can learn what they are teaching (theme 14). Early in my interview with Scott Thorp of SCAD, I told him that I had no artistic talent and could not draw. Thorp responded, "The reason why you think you wouldn't do well in art is because there's the myth of the artistic genius." The students who excel are those who have curiosity and motivation, a willingness to invest the time and the work to learn. Another SCAD professor told me that "if they have practiced, and mainly have the interest and engagement, they can learn and be more creative at whatever subject they chose." WU professor Heather Corcoran said,

> If they want it they're going to get it. I think it's absolutely teachable. If they are willing to work really hard, they can get it. I don't think the artist or designer sits in this isolated position from others, I think they just have to be invested in learning this other vocabulary.

The Self-Expression Conception.   Many professors are vehement in rejecting the self-expression conception of creativity. SCAD foundations professor Scott Thorp said, "People assume that creativity is something you throw up on the street. The creative kind of mystical thing, it really doesn't explain much."

A SCAD professor of painting told me, "Creativity is nothing mysterious. It's the same kind of thinking like everything.… [Our goal is to get students to] switch between intuitive creativity to deliberate creativity. You have to be a deliberate creator to succeed."

The Insight Conception.   Many professors explicitly deny that art and design are based on having big ideas or flashes of insight. For example, WU professor of art Cheryl Wassenaar discounted the importance of the initial idea:

> You can make a lot of ideas good. It's very rarely that I hear an idea and I think, well that has no hope. Creativity isn't just grasping at straws and coming up with something that all of a sudden you think looks good. It's a process of working through an idea and pushing it, and expanding it, and redirecting it, so that you come up with something in the end that's inventive, rigorous, and effective. You're making choices that are deliberate enough for what you're trying to do.

Eva Sutton, a professor of photography at the Rhode Island School of Design (not included in this study), also rejects the insight conception:

> Although it is often perceived that artists, designers, and creative thinkers experience 'eureka moments' in which a brilliant idea emerges, in practice, creativity is a long process. It often requires the maker to make something again and again, learning each time from the previous iteration. (Somerson & Hermano, 2013, p. 211)

As WU illustration professor Douglas Dowd said, "It's really not possible for them to make a thing that's really extraordinary without using the process." These professors believe that innate talent is not sufficient for creativity, or even that innate talent is not required at all; that having a great idea in advance is not required and may even interfere with the creative process; and that the desire to express one's inner self is particularly likely to block successful creativity. There is no other way to create than to engage in the deliberate work necessary to drive the creative process forward.

Cluster 2: Project Assignments (21 Themes; Themes 15–35)

The second research question is this: What are the pedagogical beliefs and practices found in these programs, and are they designed to lead to this conception of creativity? The themes related to this research question fell into two clusters: project assignments (Cluster 2, themes 15–35) and classroom practices (Cluster 3, themes 36–45).

Professors believe they cannot teach creativity directly but rather they can foster creativity by providing guiding structures. Professors "guide" students, "give them

a structure," "set the stage for them to be more creative than they currently are" and "open up possibilities." Creativity is a "byproduct" of activities they have students participate in (these quotations are from a painting professor at SCAD). The 21 themes of Cluster 2 articulate these guiding structures, which are called *assignments* or *projects*. A well-designed assignment poses a problem that is open ended so that there is no single obvious way to resolve the problem. Each student must identify his or her own path to a solution and complete the assignment by passing through a scaffolded version of the creative process.

Assignments are usually presented to students in a 1- or 2-page handout. The assignment includes a description of a challenge or a problem and a list of constraints (also called *parameters*) that students must follow as they pass through the creative process. A typical example is an assignment in Jeff Pike's illustration class at WU. The 2-page assignment, one of four given over the course of a semester, appears in Appendix B and is excerpted here:

> You will be creating a nine-panel comic. The comic should involve at least two characters (no more than four) and an environment.… Your subject will be one of the narratives listed below [see Appendix B for the list of seven narratives].

- Each of your nine panels will be 2" × 2.5".
- All comics will be created in a limited color palette of 2 colors, plus 1 value, and black.
- Drawing should be ink of some kind.

This process must be followed:

1. Write the narrative. Imagine a small scenario. Try thinking of a small moment.
2. Describe your story in visual terms. Create 20–30 small thumbnail sketched ideas.
3. Prepare three larger, more refined page layouts, with as much range and variety as possible.
4. Complete final scripts and sketches.

A professor in a two-dimensional design class at SCAD used this equally detailed, but very different, set of constraints:

Create a sketch that conveys:

- Something that just happened, something happening, or something about to happen
- You can only use a quarter or less of a figure
- You must use these 15 objects [provided by the instructor]

- It must be an architecturally significant interior

Professors believe that such constraints enhance creativity (theme 27). Well-designed project constraints "focus the learning on one particular thing … a good project has severe constraints … Constraints are actually setting you free" (John Hendrix, illustration, WU). A SCAD professor of architecture echoed this theme: "My hope is that boundaries actually foster your creativity." When assignments do not have sufficient constraints, students do not know how to begin (theme 24). The most difficult assignment for a student would be to "do a painting"; in response, the student would be "paralyzed by freedom" (Lisa Bulawsky, print-making, WU). A SCAD advertising professor said, "Without structure they would get nowhere at all." These practices are similar to Halverson's (2013) findings on K–12 arts learning: "Learning art, that is learning how to construct and critically evaluate these representations, requires scaffolded instruction in the representational process. Arts-based learning environments engage participants in authentic production tasks guided by explicit pedagogical practices" (p. 127).

The use of assignment constraints is consistent with experimental studies of the creative process, which have found that unconstrained tasks generally result in less creative outcomes (e.g., Costello & Keane, 2000; Moreau & Dahl, 2005). And yet, at first glance, the above constraints seem arbitrary. Why must Jeff Pike's comic have no more than four characters? Why are students required to choose one of the seven narratives he provided, and how did he choose those seven? In the SCAD two-dimensional class, why must the sketch use no more than one quarter of a figure? When asked, professors were able to articulate the reasons for each of the constraints. They were able to explain what students would do if one or more of the constraints were removed and how that alternative version of the assignment would be less likely to guide students through a successful creative process.

Professors told me that they create their own assignments; they do not get them from a textbook or a website. My literature review confirmed that there are no such materials available (although two collections of assignments have been published since the interviews: Paper Monument, 2012; Pratt Institute, 2013). To develop and refine their assignments, the professors use a process similar to design-based research (Barab, 2014). If several students generate cliché and obvious work for an assignment, it is probably because they are not sufficiently challenged and the constraints are too open ended (theme 30). When all students generate very similar solutions, professors realize that the constraints are too focused (theme 29). The assignments that I examined were the result of many years of design iteration; the professors had an average of more than 14 years of experience and had been refining their assignments for many years.

Assignment constraints are designed so that students are guided away from their instincts to develop an idea early (theme 16) and prevented from rushing to

finish the assignment as quickly as possible (theme 23). Instead, the constraints guide students through a scaffolded version of a nonlinear, experimental creative process. If constraints are well designed, then students are prevented from taking the most obvious path—one that is based on their existing knowledge and experience. In a validation interview, University of North Carolina painting professor Beth Grabowski told me, "We do this to make them aware of their own biases, their own aesthetic temperament—as needed, when it seems they've generated something reflecting their preexisting biases."

In a SCAD class in graphic design, Rhonda Arntsen gave her students a similar explanation for why she provided assignment constraints:

> Here is something completely unfamiliar that gives you this tremendous blank slate. Not something to build on, but something that you have to pull out. These are the experiences that are really valuable. These are the ones that are the most challenging, because familiarity, this is what we're taught to see, we put that familiar stuff all around you. I think it's a habit we all have. There are things that I'll be seeing sometimes even in my own work right now. You're like, "Oh. Hm. I've got this color palette all of a sudden, I'm working with." And I'm going to have to be aware of that. I have to be aware of why I'm working with it. Because it's there, and it's pleasurable, and I enjoy it, and what does it mean? Why am I doing this? Why am I repeating this?

Making choices is an important element of the process of deliberate creativity, and assignment constraints are designed to guide students in making decisions (theme 25). When students work on an assignment with constraints, a limited set of choices will emerge from their work, presenting them with a manageable decision and supporting them as they gradually master more advanced decision-making ability. In Appendix B, the assignment specifies a list of seven narratives that students must choose from; in Appendix C, five novels are specified. These lists are provided because the professors have learned that otherwise students would spend too much time thinking about this choice rather than focusing on the visual and conceptual work. If they choose a prominent event from their own life (Appendix B) or a novel they are personally familiar with (Appendix C), the students are not sufficiently challenged conceptually, because the familiarity leads fairly directly to the final work. SCAD professor of architecture Julie Varland explained that when students choose a familiar path, they are less likely to engage in a deliberate creative process: "Without the constraints of the assignment, they do what they know how to do." In a studio class, a SCAD painting professor explained to her students the logic behind her assignment constraints as they neared the end of a project:

> I wanted to reinforce that you're, you're making decisions all along the way. So you might have this great image in mind, but you don't just start … there's a process that leads you to that. Right? Do you feel that? That you didn't make all the decisions in the beginning?

The constraints are designed to be open ended enough that each student has to formulate his or her own problem while working through the assignment (theme 15). The constraints in Appendix B, for example, may seem confining, but they leave many decisions unresolved: the structure of the story, the visual style, the images that will be generated. I was constantly amazed by the broad variety of student work generated in response to even very detailed constraints. Within the constraints, each student formulates his or her own problem to pursue. In creativity research, this is referred to as *problem finding*, and a problem-finding process has been found to result in greater creativity (see Sawyer, 2012, pp. 90–93). Each student's problem emerges only after he or she begins to engage in the process. Assignments are open ended enough to provide students with an authentic experience of the creative process, one in which they progressively iterate toward a solution by working with materials, solving problems that emerge in the process, and failing and then working through that failure (see also Cluster 3, themes 41, 42, and 44, on ambiguity and failure).

The Cluster 2 themes help to elaborate the nature of the creative process. For example, assignments are designed so that the creative process does not require a good idea at the beginning (theme 16), because the best ideas emerge from engaging in the process. A common method that professors use to help students avoid settling on one idea too early is to begin an assignment by requiring students to generate many possibilities—four, 10, 20, or even 50 ideas about how to proceed (theme 18). This is consistent with creativity research, which refers to the generation of many possible ideas as *divergent thinking;* research has found that divergent thinking is associated with greater creativity (see Sawyer, 2012, pp. 46–49). For example, in the assignment in Appendix B, students are asked to develop 20 to 30 thumbnail sketches. Professors often give constraints that lead each sketch to be as different from the others as possible, which increases the range of possibilities that students generate. In the next step of that same assignment, students are asked to select three of these 20+ thumbnail sketches and develop them into page layouts "with as much range and variety as possible." In creativity research, range is referred to as *flexibility*, and it is associated with greater creativity (Sawyer, 2012, pp. 47–49). A technique that professors sometimes use to help students expand their range of thinking, and avoid fixating on one idea too early, is to ask students to generate new ideas that are the opposite of their current idea (theme 26). For example, in an illustration class, Jeff Pike (WU) advised a student how to proceed at an interim stage of a

project: "One way of, of snapping ourselves out of the doldrums is to imagine the opposite. Substituting one thing for another frequently works well."

The best ideas emerge from working with the materials of the discipline, not from thinking about ideas in advance, so assignment constraints lead students to work with materials as early as possible (theme 19; see also Cluster 3, theme 36). A painting professor at SCAD said, "The materials kind of lead them. They hear the materials more than they hear my own voice." A sculpture professor at WU said, "Ideas come from doing, not through thinking about it." When working with materials, students engage in a dialogue with the work that results in successive iterations of the work in a spiraling or zigzagging pattern (theme 17). "The first iteration never is the one that works" (Patricia Olynyk, professor of art, WU). WU professor Jeff Pike explains to his students:

> You need to pursue that and make it visual, so that we can all look at it and discuss it. At this stage of the game, self-editing is a very, very, very bad thing. And we all do it. It's really hard to get out of your head, and get out of the interior monologue, and get it out on paper where it can be useful. Sometimes you go, "What?! Hm … It's a little better than I imagined it would be!"

As in most university classes, students attempt to complete their assignments as quickly as possible. This is a time management skill that the most successful students learn in high school. But in art and design, this otherwise useful skill is considered to be problematic, because a slower and longer process is more likely to lead to successful creative outcomes. Several professors told me that talent is no shortcut; even very talented students will not generate good work if they wait until the last minute and rush through the process. This is consistent with a substantial body of research showing that effective learning takes time and sustained focus (e.g., Brown, Roediger, & McDaniel, 2014). To prevent students from rushing through the process, professors give constraints that require students to slow down (theme 23). In a painting class that I observed, a SCAD professor gave an assignment in which students used the classic technique of painting a translucent colored glaze over a neutral gray or brown underpainting. The professor told me that glazing is rarely used in painting today, and very few students will use this technique in their careers. But she created this assignment because using glazes takes a long time; each glaze layer can take 12 hr or more to dry, and multiple layers are required to achieve the desired effect. As she explained,

> If the technique requires slowing down, then they're doing it for their own learning, rather than because they've been told to. One of the quiet objectives [of this assignment] is that I have to slow them down to approach their idea in stages, rather than one huge thing.

Two weeks into this 4-week glaze project, the professor gave a similar explanation to her students:

> One thing I secretly kind of like about glazing is to give you a really good reason to work on it right after class. You know, not to wait until Sunday night, but to start right away, because you've got the drying time. And I can understand how it's sometimes you put things off, but glazing you have to get to it, so that it can have that drying time, and you have a chance to come back to it another time.

In sum, assignments guide students toward the ability to effectively and consistently engage in the creative process.

- The creative process is more likely to be successful if the idea emerges from the process, so constraints prevent students from coming up with their idea at the beginning (theme 16).
- Good ideas emerge from making and doing, so assignments require students to start generating simple work—prototypes and sketches—immediately (themes 18 and 19).
- A successful creative process is more likely to be iterative and nonlinear, so assignments are structured to guide students through multiple iterations and prevent students from taking a linear path (theme 17).
- A successful creative process often involves coming to a dead end and then finding a way to use this to drive the process forward, so assignments provide enough ambiguity and flexibility to allow students to encounter these temporary failures (theme 20).

Cluster 3: Classroom Practices (10 Themes; Themes 36–45)

In studio conversations, professors engage in a set of situated practices that guide students to engage successfully in the creative process. I observed two interactional formats in studio classes. In the first, students work independently on their projects and the professor circulates around the room, holding a 5- to 10-min conversation with each student about the work in progress. In this type of class session, I held the video camera and followed behind the professor. In the second, students take turns sharing their work in progress with the professor and the class—pinning their sketches to the wall, placing their architectural models on a work table, mounting their paintings on an easel—with the professor engaging the student in a conversation about the work as the rest of the students listen and occasionally offer comments. For these encounters, I mounted the camera on a tripod.

In both of these formats, I observed the same 10 themes (themes 36–45). The most common interactional practice I observed was that professors encouraged students to reflect on their ongoing work by talking about it in detail: how they got to this point, what they were doing right now, and where they thought they might go next (themes 37 and 38; see also Cluster 1, theme 6). In a WU class on typeface design, Ken Botnick emphasized to a student the importance of articulation:

> What I want you to do is I want you to be able to describe what you're doing with some degree of specificity, so that A, you can identify and modify the actors in that particular situation, but B, so you can figure out how to replicate it, and get better next time. Don't use ambiguous terms, there's no value in them. Because that lets you off the hook conceptually.

Because students so often start with ambiguous statements, professors frequently engage in extended exchanges with students, to push them to be more specific. In the following exchange, in a pinup review of a student's broadside posters in front of the class (see Appendix C), WU communication design professor Heather Corcoran responded to ambiguous statements by repeatedly prodding the student to be more specific:

> *Student*: I just feel like the, the text is kind of/I don't know. It's just like not that interesting to look at.
> *Professor*: Can you be more specific?
> *Student*: Um … Okay. Well I, I just feel like there's/I mean maybe it's just like the fact that my/both of my posters are very simple.
> *Professor*: Simple is a/hard word to/can you give me a little more?

When students articulate what they have done (theme 38), they are learning how to see (Cluster 1, theme 7) not only their own work but also others' work. It helps them learn how to make decisions (Cluster 2, theme 25), and it helps them learn why what they have done is or is not successful, which enables them to be more deliberate with their process (Cluster 1, theme 2).

Hetland et al. (2007) identified a similar practice in secondary arts classes and referred to it as "Question, Explain, and Evaluate" (pp. 65–73). Learning scientists have found that the externality of physical artifacts makes visible students' developing understandings and enhances their metacognitive and reflective abilities (Winne & Azevedo, 2014). Halverson and Sheridan (2014) noted that "this process [of arts learning through work] mirrors the progressive formalization of representations valued in math and science education" (p. 632).

When students talk about their work in more detail, it often becomes apparent that what they think they have done, or what they think the work is doing, is not aligned with the visible work they have generated (theme 39). In the following

two studio encounters, each professor points out a mismatch but neither professor tells the student how to resolve it; rather, they guide students to see and resolve the mismatch themselves:

- Heather Corcoran, WU, communication design: "In your head you understand dreams to be that way. But when that typeface appears on the page, I don't necessarily make that connection. Your challenge has been getting your ideas to communicate in a way that's clear to us as it is to you."
- Catalina Freixas, WU, architecture: "I want you to understand when you are representing, when you make a statement, it has to be there. Otherwise, it has no teeth. Your drawings are very, very romantic at this point for what you are talking about."

Professors know from experience that these mismatches are common. They do not believe that a mismatch is a mistake to be corrected, and they do not advise students to modify the work to align with what they are saying they have done. Rather, they guide students to be able to see the mismatch (Cluster 1, theme 7) and to use the visible work that has emerged to drive the process forward (Cluster 2, theme 19). Heather Corcoran encouraged a student to follow what emerged in her work: "I don't know how this came out of you, but it did. This has something going on. Try to steal from that. Import it back in, and see what happens." In their own work, professors have learned that these mismatches often result in the discovery of a new problem to be solved (theme 36): "As an artist I can look at what I made and say, you know what? It's doing this, but I want it to do this" (a WU sculpture professor). The goal for students is to be able to resolve "the tension between what it looks like and what the idea is" (a SCAD painting professor).

Mismatches often occur because the student has already formed an internal representation of the final work he or she hopes for and thinks that the final image he or she is intending to make is visible in the work. This is one reason professors believe that a focus on the endpoint distracts students from going through a successful creative process and results in ineffective work (theme 43). A SCAD painting professor told me,

I've learned from years of teaching that a young artist will get great ideas and will see what the final painting looks like in their mind's eye. But as soon as they encounter the materials, they get lost. They can get discouraged very easily.

To guide students away from focusing on their intended final product, professors avoid commenting on the aesthetic quality of the work. When professors comment on student work, they focus on the extent to which the student has engaged in the creative process (themes 43 and 45). I never saw a professor say

that a work was "good," that they "liked" a work, that it was "finished," or that a student had satisfied the assignment and could stop working. This is not always easy for a professor, as typeface designer Ken Botnick (WU) told me in his validation interview when we discussed this theme: "You have to actively work at it, to train yourself not to allow your aesthetic to affect your response to the work. It takes real training." Rather, professors guide students in critically examining their own aesthetic. Toward the end of a student presentation in a graphic design class, SCAD Professor Rhonda Arntsen said,

> We need to think about why these things keep coming up. Conceptually, I think you are on a great path. Aesthetically, we need to think about why certain things are repeating themselves in your ideation. I would like you to think about those things, and analyze those things.

Even the most focused assignments seem to be more open ended and ambiguous than what students are used to in other academic subjects. When presented with these open-ended assignments, students often ask the professor to give more specifics about how they should proceed, or they ask whether they are doing the assignment correctly. In a studio class with Joe diGioia, a SCAD professor of graphic design, a student summarized his interim presentation by saying at line 162 of the transcript, "So I'm completely confused now as to which direction to go." diGioia did not tell him what to do; instead, he asked open-ended questions throughout the session, including "What's our first experience with it?" and "What else do we need in here?" and "What do you think?" More than 100 lines of dialogue later, at line 273, diGioia concluded the review with "Think about what that would look like … whatever direction you want to go" and then moved on to the next student.

Most students are uncomfortable with the ambiguity of assignments (theme 41). Jeff Pike (WU) said, "Students just hate it." WU illustration professor Douglas Dowd said that students get "pissed" and "frustrated" but insisted that students need this ambiguity to learn effectively. Professors avoid giving students a specific answer because that prevents them from going through the process of discovering their own way to approach and solve the problem (theme 42). A common practice is for professors to turn a student's question back to the student and ask him or her to answer it, as SCAD illustration professor Ruben Salinas does when viewing a student's thumbnail sketches of car designs:

> *Student*: On any of the cars. Which ones I should choose.
> *Salinas*: Oh. Uh/it's not about preference. It's about what you think is going to work.

The open-ended nature of assignments often results in students attempting to create something that is too big for one work (theme 40). This is in part because they have not yet learned how to make choices (Cluster 2, theme 25). They are overly ambitious; their intentions are so complex that it is impossible to capture them in a single work; they begin with a narrative too complex to fit into one image. When this happens, professors guide students to realize that they have to narrow the idea, concept, or narrative behind the work. For example, in one studio session, Jeff Pike (WU) helped two different students to realize this situation:

> *To Student 1*: You may need to simplify the narrative. We're going to have to start peeling things away to get at what the primary communication intent is. We may have to narrow the focus in order to be successful.
>
> *To Student 2 (10 min later)*: This is a complicated scenario. You need to narrow down to the moment.

From one iteration to the next, the work can change dramatically. In many cases, there are dead ends or even outright failures, and a student has to start anew. Sculpture professor Ron Leax calls this the "I just screwed myself" moment: when a student has done quite a bit of work on a sculpture and then suddenly realizes that it is not going to work, it cannot be easily modified, and substantial new work will be necessary. Providing positive feedback is particularly important in these situations so that students become comfortable with taking risks rather than becoming cautious and afraid of future failures. Professors expect these situations, and they guide students in how to learn from them (theme 44; see Collins & Kapur, 2014, on productive failure). SCAD architecture professor Julie Varland used a vivid metaphor:

> I tend to espouse an environment that throws them in deep water. And I'm waiting there with them, kind of in a boat [laughs], extending the oar to them when they need it. Without risk, you don't learn. And you're just going about things in a highly prescribed way, you're always playing it safe.

The 10 classroom practices in Cluster 3 guide students toward mastery of the creative process, as elaborated in the 14 themes of Cluster 1:

- The creative process is conscious and deliberate. Reflection and articulation guide students to learn to be more deliberate with their process.
- The creative process is nonlinear. Classroom practices guide students to experiment in the presence of ambiguity.

- The creative process often results in a dead end that leads to a dramatic shift in direction. Classroom practices help students build on failure and use it to drive the process forward.
- The creative process is more likely to be successful if it does not begin with an idea; the visible work that emerges from the process is more often than not different from the initial intent. Classroom practices guide students to be able to see these mismatches and to use them to give them new ideas and directions.
- The creative process is derailed by a focus on what the final work will look like—particularly by a desire to make it look good or to satisfy the professor's aesthetic. In classroom practices, professors rarely tell students what they personally think about the work; instead, they help students discover their own aesthetic.

DISCUSSION

This study provides fairly clear answers to the three research questions:

- *Research Question 1*: Creativity, conceived of as a process, is the primary intended learning outcome in art and design schools.
- *Research Question 2*: Project assignments and classroom practices are designed to lead to mastery of the creative process.
- *Research Question 3*: All 15 disciplines and all 8 institutions in this study share the same conception of creativity (Cluster 1) and the same pedagogical beliefs and practices (Clusters 2 and 3).

Research Question 1: Creativity as a Learning Outcome

The first goal of this study was to determine to what extent creativity is an intended learning outcome of art and design programs and what conception of creativity is taught and learned. Creativity, conceptualized as the creative process, was found to be the most important learning outcome of studio pedagogy in both art and design disciplines. The other three conceptions of creativity—creativity as a personality trait, as self-expression, or as a moment of insight—do not appear in these data. In fact, many professors explicitly reject these conceptions, and some even argue that they can actively interfere with successful creativity. Art and design professors were also found to teach many things that are discipline specific, including technical skills and the body of historical and contemporary work in the discipline. But even these discipline-specific learning outcomes are

taught in the context of the creative process (themes 10, 11, and 13) and are valuable primarily as ways to advance the creative process.

Creativity is a deliberate process that can be taught and learned. Creativity develops from curiosity, motivation, and engagement. Creativity involves critical thinking and problem solving. The creative process consistently leads to original and successful work when deliberately pursued in the following manner:

- The creative process does not begin with an idea. Ideas emerge from engaging in the process.
- Skills, techniques, and materials are not simply tools to execute a creative vision; they play essential roles as a source of ideas.
- The process is iterative, with unpredictable shifts in direction.
- The process takes a long time and cannot be rushed.
- The process involves experimentation.
- The process involves dead ends and failures, which are considered to be an important element of a successful process.
- The process should not be focused on the final work.

Research Question 2: Teaching and Learning for Creativity

The second goal of the study was to determine how teaching and learning for creativity is organized and executed in these learning environments. The study revealed a general pedagogical approach, one that is aligned with a conception of creativity as a creative process. I found no evidence for pedagogical practices oriented toward or aligned with the other three creativity conceptions.

Students are thought to best learn the creative process through discovery, experimentation, exploration, and active learning. They are guided through a nonlinear, iterative process by assignment constraints and studio encounters. They externalize ideas early and frequently. They work with materials throughout the process, and ideas emerge from engaging in the process. Students often encounter mismatches between their work and their intention for it; professors guide students to benefit from these unexpected developments. A successful creative process takes time because of these iterations and dead ends; studio pedagogy guides students to progress through the process more slowly.

Professors invest substantial thought in the design of their project assignments. Of the three clusters, the project assignments cluster has the most themes —21 of the 45 themes. And yet the logic behind assignment design has not been elaborated and analyzed in previous studies of art pedagogy (e.g., Hetland et al., 2007, but see pp. 17–19; Seidel et al., 2009, but see pp. 34–37) or in studies of design education (e.g., Shaffer, 2007, but see pp. 105–109). Although open ended, assignments still have many constraints. Without these constraints,

students are not challenged; they do what they already know how to do, and they use concepts and tools they have already mastered. Assignment constraints are chosen so that the assignment is open ended enough that students have to make choices about where to focus. Students have not yet mastered this ability, so project constraints limit the range of choices, scaffolding students to develop decision-making ability. Professors engage in classroom practices that guide students through active learning in the presence of ambiguity—for example, by helping students when they choose an unmanageably broad approach to the project.

Project assignments share features with those used in project-based learning (Krajcik & Blumenfeld, 2014) and in problem-based learning (Lu, Bridges, & Hmelo-Silver, 2014). Problem-based learning uses open, ill-defined problems, and there is some evidence that problem-based learning may develop creativity (e.g., Awang & Ramly, 2008; Stouffer, Russell, & Oliva, 2004). According to Krajcik and Blumenfeld (2014), project-based learning assignments have five key features found to some degree in the studio model: (a) The assignment starts with a driving question; (b) learners are guided as they participate in authentic, situated inquiry; (c) students and teachers engage in collaborative activities; (d) the assignment scaffolds learners so that they can participate in activities normally beyond their ability; and (e) the assignment guides learners toward creating a set of tangible products that address the driving question.

The studio model is consistent with many of the principles of effective learning that have been identified in learning sciences studies of nonarts disciplines (as also demonstrated by Halverson, 2013). Learning environments that foster discovery and inquiry are central to constructivist pedagogy. Learning sciences research has demonstrated that constructivist learning processes must be scaffolded to result in maximum effectiveness (Reiser & Tabak, 2014). The consensus emerging from learning sciences research is that the most effective learning environments are constrained while nonetheless providing students with the opportunity to engage in authentic, situated inquiry practices (e.g., Mayer, 2004).

Research Question 3: The Generality of the Studio Model

The third goal of the study was to determine whether I could identify a single cultural model of teaching and learning for creativity, one found in multiple art and design disciplines and at multiple institutions. One of the most striking findings of this research is that a large number of beliefs and practices, in an articulated and coherent cultural model, are shared across the many communities of practice participating in the study: 54 professors, eight institutions, and 15 art and design disciplines.

Furthermore, the studio model is found at both the undergraduate and graduate levels. A final item added at the end of the validation interview asked whether the interview's themes applied to both bachelor's- and master's-level

degree programs. The 22 respondents reported that the 45 themes apply to teaching and learning at both levels (validation interview score = 4.0).

Limitations and Future Directions

The research questions and methodology of the study result in several limitations, each of which suggests an opportunity for future research.

First, the methodology focused on teaching rather than learning. To be sure, the great majority of the students seemed to learn effectively: They received high marks and generated works that seemed impressively creative to my untrained eyes. But I do not have causal evidence that the assignments and practices of the studio model are responsible for students' ability to engage in a successful creative process that results in creative works. This suggests additional study to examine whether these assignments and practices lead to creativity, problem solving, critical thinking, a way of seeing and perceiving creative work, and the ability to opportunistically enlist skills and disciplinary knowledge as students participate in an authentic creative process (Cluster 1).

Second, I did not explore differences among disciplines or differences between the two institutions. To answer Research Question 3, I designed the methodology to identify shared, domain-general pedagogies, and this article only discusses themes that were found in both art and design disciplines and at the two institutions. This methodology revealed a surprising degree of similarity in the pedagogies of these disciplines and institutions. Now that these similarities have been identified, future study can explore whether these themes are executed in slightly different ways in different disciplines or whether one or another theme is more prominent in some disciplines or institutions. Future research might also identify themes that are specific to only one discipline or one institution.

Third, I was not systematic about when I did the observations in the course of a semester or over the years of a program. Different themes might have emerged from observations on different dates in a single semester or during the extended process of project work. Additional study could examine whether various elements of the model change in prominence at different points in a semester, in different years of a program, and at undergraduate and graduate levels.

Fourth, in my focus on single class sessions, I did not observe features of pedagogy that fall outside of a single course—for example, the way in which courses are sequenced across the years of a program or the way in which student progress is evaluated. This may be why the practice of the critique did not emerge from this methodology. A *critique* is a form of summative assessment that is emotionally charged because of its importance as a student evaluation mechanism. In many programs, the academic year ends with a panel of professors critiquing a student's full body of work in all courses taken that year. Because of its importance in assessment, there have been several writings by

art and design educators about the critique (Buster & Crawford, 2010; Elkins, 2014; Waters-Eller & Basile, 2013). Its absence from the studio model might also indicate that the critique is not considered to be a pedagogical practice but rather is used primarily for assessment. Future research might examine these program-level pedagogical practices and to what extent they align with the studio model documented here.

CONCLUSION

The studio model is a cultural model of teaching and learning shared among professors in art and design. Because of the paucity of empirical research to date, this study makes a contribution by documenting that creativity is an important learning outcome in art and design schools, documenting how creativity is conceived, and documenting the assignment structures and classroom practices that are designed to guide students toward creativity. The studio model is found in the eight U.S. higher education institutions included in this study and is found across 15 creative disciplines in fine arts and design. Because of this generality, it is likely to be found in other disciplines not studied here and at other art and design institutions.

In future research, similar studies could examine the cultural models associated with professional education in other creative disciplines, including writing, theater, music, and dance. These disciplines may have different conceptions of creativity and different pedagogical models. If so, these could be compared to the studio model to develop a fuller understanding of creative teaching and learning.

Given the large body of research on K–12 arts education, it may be productive to compare and contrast the studio model with secondary school arts pedagogy. Previous studies suggest that the intended learning outcomes of secondary arts programs are both similar to and different from the conception of creativity that appears in Cluster 1 of the studio model. For example, of the seven purposes of arts education identified in interviews with educators in the Harvard Qualities of Quality study (Seidel et al., 2009), three seem closely related to the studio model's Cluster 1 (thinking creatively, skills and techniques, and aesthetic awareness), and these potential overlaps warrant further examination. However, four of the K–12 intended learning outcomes do not appear in the studio model (ways of understanding the world, engaging with community and civic issues, personal expression, and developing as individuals). Studies of both K–12 arts education and professional arts education could mutually inform one another.

It might also be productive to compare the studio model with studies on K–12 design and technology education. Such studies have long been conducted in the United Kingdom, where design and technology is part of the national curriculum (see the journals *Design and Technology Education* and *International Journal of*

Technology and Design Education). More recently, U.S. schools have begun to incorporate maker spaces and computer technology into their curriculum, often in ways inspired by professional design practice. Because the studio model is shared by both art and design disciplines in higher education, it might also be the case that K–12 arts education and design education would benefit from additional collaboration.

Another productive line of study would be to examine how the studio model might relate to pedagogies in nonarts disciplines. I began this article by noting the national and international importance of transforming pedagogy in all professions to result in creative learning outcomes. The studio model presents a conception of creativity as a deliberate process, one that is general across art and design disciplines. This generality suggests that the model may be applicable to education in nonarts disciplines. However, an effective and successful creative process may be different in nonarts fields like science, politics, business, and engineering. For example, the creative process in science and engineering may be more linear than in art and design. An increasing number of engineering programs have adopted studio pedagogies (e.g., Hundhausen, Fairbrother, & Petre, 2011; Lasky & Yoon, 2011; Thompson, 2002), and these could be compared and contrasted with art and design pedagogies to develop a broader understanding of creativity and of creative learning.

In summary, in professional schools of art and design, the primary intended learning outcome is to enhance the ability of students to consistently generate successful creative works. In this community of practice, creativity is conceived of as a process of working in which ideas, themes, and concepts emerge from a dialogue with the unfolding work. Students are also taught discipline-specific learning outcomes, such as the techniques necessary to generate work and the history of precedents in the field. But these discipline-specific learning outcomes are considered to be in service to the creative process and to be most effective when they are enlisted within a process of ongoing creative work.

Perhaps most surprising—given the widespread conception that the fine arts are pure creative activities, whereas design fields are often considered to be practical and applied—is that the studio model of teaching and learning for creativity is general across 15 art and design disciplines in creative practices as varied as fine art painting, advertising, and architecture. The studio model is found in both undergraduate- and graduate-level programs and is general across eight different U.S. institutions. This generality suggests that the studio model may represent an approach to teaching and learning for creativity with relevance for nonarts disciplines.

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APPENDIX A

The Studio Model's Three Clusters and 45 Themes

For each theme, the wording below was used in the validation interview (VI). Respondents were asked to rate their agreement with each statement from 1 (*definitely do not agree*) to 5 (*definitely agree*). A total of 22 professors completed the VI. The scores reported here are the average ratings of the 22 professors.

Cluster 1: Learning Outcomes

1. Professors teach students how to be creative. (VI = 2.8)

2. Professors teach a process of deep and deliberate creativity: A rigorous, critically engaged methodology that is more likely to generate successful work. (VI = 4.5)

3. Professors foster student creativity, by providing guiding structures that maximize their likelihood of generating good work. (VI = 4.6)

4. Professors teach students how to generate new and original work. (VI = 3.9)

5. Professors teach students to become problem solvers. (VI = 4.5)

6. Professors teach students a way of thinking, how to think critically, about their own and other's work. (VI = 5.0)

7. Professors teach students how to see. (VI = 4.8)

8. Professors teach students how to generate work that engages and communicates with the viewer/user/client. (VI = 4.6)

9. Students focus on what's visible; professors teach students to see negative space. (VI = 4.2)

10. Professors help students connect what they've done to the discipline—to past and contemporary works and artists. (VI = 4.3)

11. Professors teach students the techniques and terminology of the discipline. (VI = 4.3)

12. Professors teach a basic visual language in the early years of the program: forms, relationships, principles, coherence, organization, visual hierarchies. (VI = 3.9)

13. Professors teach techniques in the context of engaging in the artistic/design process, not in a separate prerequisite "technique" class. (VI = 4.4)

14. Anyone can learn how to be an artist or designer, as long as they are curious and motivated, and willing to put in the work. (VI = 4.3)

Cluster 2: Project Assignments

15. Assignments are open-ended enough that each student has to find their own problem and develop their own solution. (VI = 4.3)

16. Assignments don't require students to come up with a great idea at the beginning. Instead, assignments are designed so that ideas emerge from going through a process. (VI = 4.3)

17. The process isn't linear; there's a lot of iteration, with unpredictable shifts in direction. Assignments often have iterations and steps built in, to guide students to learn how to successfully navigate these frequent unexpected changes. (VI = 4.9)

18. Many assignments require students to generate a specific number of possible solutions. (VI = 4.1)

19. Good ideas emerge from making and doing. That's why many assignments require students to start working with materials right away. (VI = 4.7)

20. Some assignments are designed to lead students to fail early; this helps them learn how failure can move them forward. (VI = 2.8)

21. Constraints challenge students so they have to stretch beyond what's easy for them. (VI = 4.9)

22. Constraints are designed to prevent students from taking the obvious path, because that results in cliché and ineffective work. (VI = 3.9)

23. A successful process takes a long time. To help students learn to slow down, assignments often have constraints that keep them from rushing to generate a final work. (VI = 4.5)

24. Without constraints, students are directionless and don't know where to start. (VI = 4.3)

25. Assignments force students to make choices about where to focus. (VI = 4.5)

26. Many assignments ask the student to do the opposite of what they just did —a different version, context, or medium. (VI = 3.6)

27. Constraints enhance student creativity. (VI = 4.2)

28. What's not constrained is what professors want students to learn. (VI = 3.8)

29. Professors know the assignment has too many constraints when students generate similar work. (VI = 3.2)

30. Professors know the assignment has too few constraints when students generate obvious and cliché work. (VI = 2.9)

31. Earlier classes have assignments with more constraints, and professors reduce the constraints as students progress through the program. (VI = 3.8)

32. Earlier classes tend to spend more time on technique and technical skills. (VI = 3.9)

33. Assignments get progressively more complex. (VI = 4.1)

34. Each assignment builds on the previous one, and leads logically to the next. (VI = 4.1)

35. Professors often break assignments into sub-steps, each with a distinct deliverable and date. (VI = 4.6)

Cluster 3: Classroom Practices

36. Professors guide students in a process of experimentation where they discover their own question. They learn better if they discover it through working. (VI = 4.7)

37. Professors guide students to reflect on their process—where they've been, how they got to this point, and where they intend to go next. (VI = 4.9)

38. It's important for students to be able to discuss their work and analyze the decisions they have made. Professors often ask students to articulate how their work developed. (VI = 4.8)

39. Students often generate something that's disconnected from what they think they've done. Professors guide students to notice the mismatch, and then to think about how to resolve it. (VI = 4.6)

40. Students often start with an idea that's too big for one work. Professors guide them to narrow, focus, simplify. (VI = 4.4)

41. Often students get frustrated by ambiguity—of the assignment, or of what professors suggest to them. The ambiguity is necessary because it allows each student the opportunity to formulate and solve their own problem. (VI = 4.2)

42. When assignments are ambiguous, students often ask for more specifics. It's important to not give them more specifics; that will prevent them from finding their own way. (VI = 3.4)

43. Professors guide students to understand that art/design is not about the final work; what's important is the process that leads to the work. The final work can always be revised. (VI = 4.6)

44. When students fail, professors give constructive feedback and guide them in how to learn from the failure. (VI = 4.7)

45. When professors comment on student work, they don't say whether they like it or not; their own aesthetic isn't important. What's important is to guide students toward an understanding of their own aesthetic. (VI = 4.0)

(Added at the end of the VI) These statements apply to both bachelor's and master's teaching and learning. (VI = 4.0)

APPENDIX B

Pictures for Communication
F10 292
Spring, 2011

Jeff Pike
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Project 2
A Short Comic Event

You will be creating a nine-panel comic. The comic should involve at least two characters (no more than four) and an environment. You do not have to be one of the main characters. Your subject will be one of the narratives listed below. Resist the desire to over-think your choice.

1. An unusual Sunday nap
2. A frustrating drive to work
3. Embarrassment in public
4. First encounter with death
5. Weather wrecks an outing
6. A badly timed delay
7. An introduction to romance

Methodology

Part I

Write the narrative. *Think small.*

Within your chosen story line you should imagine a small scenario. Do not necessarily set out to write a punch line in the final panel. This is not a comic strip *per se*, but a short event being described in visual terms. Try thinking of a small moment, e.g. spilling your coffee in the car when you stop quickly, and build your narrative around it.

Part Too

Visual development. *Describe, don't explain.* Once you have created your story, describe it in clear visual terms. Create small thumbnails of the panel architecture. Use

FIGURE B1   A project assignment used in Professor Jeff Pike's illustration class at Washington University.
Used with permission from John Hendrix and Jeff Pike.
(Continued)

rough drawings in that template to test the pacing of your story as the panels interact with one another. Consider these evaluation criteria:

1. How much can you remove from the panel and still have it function?
2. What is the relationship between what is shown and what isn't?
3. What is the climax of the story?
4. How can you use point of view to influence the tone?
5. What must the viewer understand before they can understand anything else?

Objective

Comics tell compact, efficient stories. They allow the readers to fill in the gaps as their eyes jump across the gutter between panels. Because you have a limited amount of space, you must clearly delineate your goals for the comic. This project should allow you to explore formal image and character development as well as concise storytelling. The usual inclination is to rush through the storytelling to get to the drawings. However, you must have a solid framework of communication underneath those images to retain a viewer's prolonged interest.

Size

Each of your nine panels will be 2" X 2.5". The rough nine-panel layout is attached. You can use this template for your final comic in either horizontal or vertical format. All nine panels must be mounted on a single piece of black matt board with a 2" broader around the exterior perimeter for your final presentation.

Media

All comics will be created in a limited color palate of 2 colors, plus 1 value, and black. Drawing should be ink of some kind: brush, dip pen, rapidiograph, micron, marker, etc. Color may be the same media, color pencil, or digital.

Schedule

During the next class meeting we will be discussing your rough ideas as a group. Come prepared with the following materials:

- Your written script
- Between 20 and 30 small thumbnail sketched ideas

3 larger, more refined and readable page layouts, with as much range and variety as possible are due **Tuesday, February 22nd**.
Final scripts and sketches are due **Tuesday, March 1st**.
Project is due **Thursday, March 10st**.

FIGURE B1   *(Continued)*
Used with permission from John Hendrix and Jeff Pike.
Note. This assignment was originally created by John Hendrix, also a professor at Washington University.

APPENDIX C

diptych broadsides: beginnings & endings

Communication Design
College and Graduate School of Art
Sam Fox School of Art & Design
Washington University in St. Louis
Spring 2011

Professors

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Assignment

Each of you has been assigned a novel. You will design two broadside/posters in which you display a short text from the beginning and a short text from the ending in the most visually dynamic way possible. You may use images, or not.

Your posters should function as interesting companions. This is an opportunity for visual—and more specifically, typographic—risk. What is the relationship between expressive type and communicative value?

Your process should involve a wide range of solutions. Given. But it should also involve a distinct set of entry points into the problem. *Your first body of evidence should include:*

1. Read and select.
Read or read your novel. Think about its story arc, meaning and use of language. Think about how the beginning and ending frame the novel.

Select two passages of no more than 100 words each from the first few pages and last few pages of your novel. You may not eliminate any text between the first and last words of your passages. Your job is to select, interpret, and express, but not to write or edit.

2. Collect examples.
This should include examples of expressive type in the world that may or may not relate to your text, as well as examples of posters are other surface design that uses type expressively. How are people borrowing and manipulating letterforms? How might you adapt their ideas and methods?

3. Find visual material.
Collect images or other visual material related to your texts. Go for variety and volume.

4. Make visual sketches.
Sketches of potential approaches to the broadside. Worry less about pairings, initially, and more about volume, ideas, and range of formal approaches.

Novels, 2011

Willa Cather: *My Ántonia*
Dave Eggers: *You Shall Know Our Velocity*
Cormac McCarthy: *All the Pretty Horses*
Zora Neale Hurston: *Their Eyes Were Watching God*
Michael Cunningham: *The Hours*

Criteria

Each of your posters must include your assigned text so that it can be read, the name of your book, the author, and the year.

16x20 inches

Posters must be output on one surface.

Image, color, type unlimited.

Due April 22..

FIGURE C1 A project assignment used in Heather Corcoran's communication design class at Washington University.
Used with permission from Heather Corcoran.