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Abstract
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Keywords
Higher Education, Writing to Learn, Creativity, Instructional Strategies

Students' Opinions of Instructional Strategies in a Graduate-Level Creativity Course

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This paper empirically examines a variety of instructional strategies as impetus for creative thinking and achievement in a graduate-level university course. This empiricism considers students' opinions about the strategies used and the resulting effect of the class more holistically. Results indicate that reading the textbook and writing bi-weekly reflection journals were the most valued strategies by students for elevating creative thinking. The course, as a whole, did have benefit in that students felt that it allowed them to transform themselves into more creative thinkers.

INTRODUCTION

The college experience should promote flexibility in thinking (Bain, 2004; Robinson, 2001). A variety of thinking skills have gained favor in academic circles, including critical thinking (Brookfield, 1987), design thinking (Wang, 2010), social justice thinking (Cavallero, 2013), and problem solving (Knowlton & Sharp, 2003). One type of thinking skill that should be equally prominent in the higher education classroom is creative thinking (Halpern, 2010; Robinson, 2001). Creative thinking may well be elusive (Cameron, 1992), difficult to cogently conceptualize (Csikszentmihalyi, 1996), and impossible to quantify (Kaufman, Plucker, & Baer, 2008). These characteristics sometimes cause creativity to be ignored, denigrated, and denied its rightful role as a mode of inquiry and activity within higher education classrooms (James & Brookfield, 2014; Robinson, 2001).

To elevate creativity to its needed prominence and rightful role, more empirical research is needed. Creativity has been a neglected research topic, in general (Sternberg & Lubart, 1999), but more specifically, creativity has been neglected as a research topic as it relates to higher education classrooms. As Halpern (2010) notes, when it comes to college student thinking, "creativity is still more of a desirable vision than an empirical outcome" (p. 381). This paper takes a step toward filling the empirical gap by considering instructional strategies and course systems that lead to creative achievement among graduate students.

A REVIEW OF LITERATURE: CREATIVITY IN HIGHER EDUCATION

Numerous insinuations and argumentative explications support the view that creativity within higher education may be important (see, for example, James & Brookfield, 2014; Sandeen & Hutchinson, 2010; Knowlton, 2010a; Knowlton & Nygard, in press; Phipps, 2010; Robinson, 2001). These explications cover a full range of topics, from the integration of creativity as a focus for students' scientific research (see, for example, Simonton, 2012) to the integration of creativity into the arts (see, for example, Livingston, 2010). Certainly, too, interdisciplinary approaches that bridge the divide from art to science are important in ensuring creative achievement among students (Costantino, Kellam, Cramdon, & Crowder, 2010). In all cases, innovative intentions and passion might be related to college students' creative achievement (Luh & Lu, 2012).

Some literature focuses on presentation strategies—what the professor does—as a means of promoting creativity. Indeed, Chambers (1973) found that professor behaviors generally could promote or hinder creativity in the college classroom. Brunkalla (2009) found that the use of blocks as manipulatives in a college geometry course increased students' awareness of creativity, yet student work did not necessarily become more creative. Muirhead (2007) purports to share "relevant ways to integrate creativity into instructional activities across the academic disciplines" (p. 1). But, those "ways" include ethics-based case studies, "Jeopardy" style games, constructivist approaches to learning, and insurance that students receive feedback on their writing. An appropriate criticism of many of these strategies is that they are not unique to the promotion of creativity. Much literature, for instance, advocates the use of case studies, games, and constructivist approaches; very little of this body of literature has an expressed intention of creative achievement among students.

Other literature more directly discusses the need to support students' creative work. Halpern (2010) aimed psychology students toward producing creative work; she discovered that college students need help understanding both the definition and potential applications of creativity. Crispin (2008) found that iPods can serve as a tool for developing college students' creativity. Cheng (2011) found that the use of creative problem-solving in a web-based cooperative learning format can increase problem-solving performance and improve students' attitudes about creativity. Yeh and colleagues found that a knowledge-management model where students are responsible for both creating and sharing knowledge is effective in improving college students' creative abilities (Yeh, Yeh, & Chen, 2012).

In total, the current literature begins establishing a case that higher education can help students think creatively and improve their creative achievement. As this literature review implies, though, various ideas exist on how best to support creative achievement. Additional empirical research is needed. This paper furthers empirical work in the area of creative thinking within higher education. Specifically, this paper is based on research that was conducted within a graduate-level creativity course. The research focuses on both instructional strategies and course systems as a means for fostering creative achievement among students.

THEORETICAL FRAME

This theoretical framework illuminates various ideas and assumptions that are relevant in (a) appreciating the design of the course

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that is the basis of this paper, (b) understanding the design of the empiricism, and (c) interpreting elements of the empirical results.

Creative Achievement

Certainly, a key purpose of the course described in this paper was to support students' creative achievement. Defining the scope of creative achievement, however, can be tricky (Kaufman & Baer, 2004), as it sometimes is equated with allied, but different, concepts (Sternberg & Lubart, 1999). In interviewing twelve academics, for instance, Kleiman (2008) developed "a list of over 30 possible different variations in conception of the experience of creativity in learning and teaching" (p. 211).

Even in more general literature about creativity, the variety of allied concepts is clear: Cameron (1992) notes that creativity is "spiritual" (p. 2). Lehrer (2012) conflates creativity with imagination, though Robinson (2001) distinguishes between the two. Creativity also has been connected with notions of ego (Knowlton, 2013), innovation (Sims, 2011), mysticism (Sternberg & Lubart, 1999), self expression (Runco, 2004), and "unusual thoughts" (Csikszentmihalyi, 1996, p. 25).

To design the course that was the focus of this study, the course professor set aside the multifaceted concepts that were just listed and, instead, used a streamlined definition: *Creative achievement results in ideas or products that are novel and have value within specific contexts*.

While context, novelty, and value are commonly-highlighted anchors for definitions of creativity (see, for instance, Csikszentmihalyi, 1996; Lubart & Guignard, 2004; Robinson, 2001), equally important within this definition is the nuance of "results in." Creative achievement, as defined for this course, emphasized the processes that "result in" the ideas and products, not just the ideas and products themselves. A lot of creativity literature emphasizes process (see, for instance, Cameron, 1992; Carson, 2010; Csikszentmihalyi, 1996; Lamott, 1995; Michalko, 2011; Robinson, 2001). Alone, product-driven considerations of creativity are problematic (Root-Bernstein & Root-Bernstein, 2004; Runco, 2004). This is particularly true in the higher education classroom, as Bull (1995) found that instructors believe that process approaches to teaching creativity are essential.

Importantly, process-driven conceptions of creativity must be understood in light of a systems view (Csikszentmihalyi, 1996), which inherently includes the environment in which creative achievement is expected (Abuhamden & Csikszentmihalyi, 2004; Robinson, 2001). Many examples of creative achievement within Burkus (2014), Sims (2011), and Lehrer (2012) support the value of a systems view of creativity. Higher education classrooms are each, within themselves, unique systems (Knowlton, 2010a; 2013); thus, the systems view is particularly important in this research. As will be seen, data collected within this study focused on students' beliefs about the impact of the classroom system. This section discusses, first, a creative process cycle and, second, the demands placed upon students within a classroom system that values creative processes.

Creative Process. A classical model of the creative process has four stages (Carson, 2010; Csikszentmihalyi, 1996; Robinson, 2001). The path through these stages is highly iterative and cyclical (Cameron, 1992; Lehrer, 2012; Robinson, 2001).

The first stage is *preparation,* where one is "becoming immersed . . . in a set of problematic issues that are interesting and arouse curiosity" (Csikszentmihalyi, 1996, p. 79). Preparation also requires a type of openness and inquisitiveness that is indicative of a growth mindset (Sims, 2011). In this stage, problem finding is more important than problem solving (Robinson, 2001; Runco, 2004).

The second stage is *incubation*. Certainly, incubation can come from deliberate attempts to manipulate information toward the goal of having an insight (Carson, 2010). One approach that supports deliberate incubation is "writing to learn," which is the idea that writing can be an act of discovery and a means for processing ideas (Adams & Hamm, 1990; Young & Fulwiler 1986). As students write, they learn what needs to be considered (Lamott, 1995; Lindemann, 1995). Conversely, though, incubation sometimes requires defocused attention and trusting a sense of non-deliberate spontaneity (Lehrer, 2012). Non-deliberation allows "ideas [to] churn around below the threshold of consciousness" (Csikszentmihalyi, 1996, p. 79). This idea of incubation allows for "mystical influence" as a manifestation of the truth that "learning sometimes cannot be controlled or forced. It only can be allowed" (Knowlton, 2013, p. 24).

The third stage is *insight* or *illumination*. Insight sometimes comes as one large realization—the proverbial a-ha moment (Csikszentmihalyi, 1996; Lehrer, 2012). Other times, though, insights come through a series of smaller revelations. In many cases, creators describe insight as if answers inspirationally "were coming from somewhere outside themselves because they did not consciously think up the idea; it was just suddenly there" (Carson, 2010, p. 67).

The fourth stage is *verification*. Csikszentmihalyi (1996) divides verification into "evaluation" and "elaboration" (p. 80). Within verification, an idea is first evaluated, with particular attention to external criteria that seem inherent to the culture and domain in which the creative achievement is being attempted (Csikszentmihalyi, 1996). Then, assuming the idea is evaluated positively, acts of elaboration are needed to make the idea more useful and valuable (Lehrer, 2012). Such elaboration often occurs through "conceptual blending," as a means of forging new connections (Michalko, 2011, p. xiv).

Demands on Intended Creators. Much literature is clear that aiming for creative achievement places high demands on the creator (see, for instance, Broudy, 1994; Csikszentmihalyi, 1996; Cameron, 1992). As a basic example, consider the demands of workload and persistence. As Simonton (2004) has noted, creative quality is a function of quantity and attempts. If Simonton is right, then creative achievement requires a high quantity of output. Such demands can take a personal and professional toll from creators (Csikszentmihalyi, 1996). Beyond workload, the professor of the creativity course discussed in this paper assumed three additional demands as being important to a systems view of creative achievement.

First, creators must be able to clearly and cogently communicate the value of their ideas in writing. This demand is consistent with "writing to learn" as a tool for deliberate incubation. This demand, however, is contrary to some existing literature. For instance, James and Brookfield (2014), Feist (2004), and Robinson (2001) each suggest that verbal abilities and the language domain represent a limited means for demonstrating creativity. Nonethe-

less, a premise of the course design was that writing is a cultural norm of college classrooms and thus should be an important means for promoting and demonstrating creative achievement.

Second, a student must understand the stages to creativity as described earlier in this theoretical framework. Each stage requires a different type of thinking. To paraphrase T. S. Eliot, "The bad [creator] is usually unconscious where he ought to be conscious and conscious where he ought to be unconscious" (quoted in Lehrer, 2012, p. 81). For nascent students, the shifts in thinking can be demanding; those shifts, though, absolutely are necessary to ensure that creative achievement occurs. Through accepting the need for various thinking approaches, students who are aiming for creative achievement can better navigate the stages of the creative process within the classroom system.

Third, creative achievement requires students to trust their own ideas and inclinations; to do so, they must take risks and allow for psychological vulnerability. Indeed, true creators must "clear a space for the [authentic] voice, hacking away at [other voices] with machetes" (Lamott, 1995, p. 7). Only through attention to authentic voice can the student discover "a new sense of self marked by increased autonomy, resilience, expectancy, and excitement" (Cameron, 1992, p. 5-6). Such a discovery can lead to a new awareness about the ways that "societal rewards" can hinder "the genuine needs of the self." Instead of experiencing tangible rewards from society, one who is being creative learns to "harvest the genuine rewards of living" (Csikszentmihalyi, 2008, p. 19-20). This discovery involves risk taking and uncertainty. After all, some of the very voices that students must "hack away" are ones that many of them have depended upon for stability—the voice of family, professors, religious leaders, and even cultural memes. Also, this type of risk taking is inherently emotional (Cameron, 1992; Henderson, 2004), which can be disconcerting to students who view learning strictly as a cognitive endeavor.

Milieu of the Traditional College Classroom

Because this paper assumes a systems view of creativity, any attempts to understand creativity within the college classroom must consider the larger context in which that classroom exists. Csikszentmihalyi (1996) notes that perhaps "universities are too committed to their primary function, which is the preservation of knowledge, to be very good at stimulating creativity" (p. 130). Robinson (2001) seems to agree, noting that higher education institutions value "linear progress," which contradicts the cyclical and iterative nature of the creative process. This contradiction, Robinson says, is "why creative people often find themselves at odds with education" and why good students sometimes "find themselves in increasing difficulties" when asked to achieve creatively outside of academia (p. 48). A central tenet of this article's framework is that the milieu of the traditional college classroom conflicts with notions of creative achievement. In what follows, two salient examples are discussed.

The Professor-Centered Classroom. The professor-centered classroom often is the norm and core of the college classroom (see, for instance, Hagopian, 2013; Finney, Finney, & Spake, 2010; Ramsden, 1992). A professor-centered classroom is based on the formal authority of the professor and emphasizes professor behaviors and notions of teaching as an act of telling. As noted in the literature review, some research on creativity in higher education has shown that professor behaviors can spur student creativity. We argue, however, that a professor-centered classroom undermines the earlier-stated demands that students must accept in order to creatively achieve.

The professor-centered classroom implicitly privileges professor voice (Knowlton, 2010b; Hagopian, 2013). A disproportionately strong professor voice robs students of the demand that they trust their own authentic voice. A professor-centered classroom also embraces a pedagogy of lecture, memorization, and recitation. When this pedagogy is implicit to the classroom, the main mode of thinking required of students is efficient recall (Knowlton, 2013). Thus, college classrooms sometimes perpetuate a vicious cycle that manifests itself in a "joyless, routinized discharge of conventional obligation whose 'rightness' lies less in the nature of the tasks . . . than in the general expectation that [those tasks] will be carried out" (Broudy, 1994, p. 6-7). To say it directly: Traditional classrooms require students to complete perfunctory tasks that require a narrow range of thinking. As a result, these students do not have to accept the demand of understanding the creative process and shifting their thinking approaches to match each stage of that process.

In designing the course that is the basis of this study, professor-centeredness was rejected in favor of Bain's (2004) "Natural critical learning environment" (p. 99). Within this environment, the course syllabus explicitly promises students a meaningful learning experience if students commit to "struggling with an issue from their own perspective" and "articulat[ing] a position" based on their struggles (p. 110). Within this type of environment that Bain supports, creative achievement is more likely to occur: "Struggling with an issue" can be done by harnessing the power of the creative process. Considering "their own perspective" and "articulating a position" requires students' willingness to hear their own authentic voice and share that voice in writing.

Assessment and Grading. Grading can hinder creative achievement. Often, for instance, grading implicitly suggests a norm that learning can be quantified based on products; as noted earlier, however, true creative achievement focuses on quality processes, not quantifiable products (see, for instance, discussions by James & Brookfield, 2014). Robinson frames this idea by calling into question the degree to which creative achievement can be quantitatively measured "in the same way [as] rainfall or high tides" (p. 79). The inability to measure creative achievement puts creativity at a disadvantage in many classrooms: "In the current historical climate, a domain where quantifiable measurement is possible takes precedence over one where it is not" (Csikszentmihalyi, 1996, p. 40).

Furthermore, assessments sometimes become "a methodical calculus" for grading. Within this calculus, "assignments are broken down into patented rubrics and detailed percentages that range from the tedious to the molecular" (Hagopian, 2013, p. 11). Students recognize this emphasis on the calculus and accompanying tedium; thus, those students focus on their grades. In fact, in many college classrooms, students "learn to judge themselves" (Robinson, 2001, p. 51), if not define themselves (Knowlton, 2013), by their grades. If students are appealing to externally-given grades for judgment and self definition, then those students are not accepting the demand of listening to one's own authentic voice.

COURSE DESIGN AND IMPLEMENTATION: A CONEXT FOR THIS STUDY

A graduate-level special topics course called "The Art of Creative Living for Educators and Organizational Leaders" was offered in a summer semester within the School of Education at Southern Illinois University Edwardsville (USA). The course lasted for twelve weeks and was conducted as a hybrid course—meeting face-to-face on four occasions, with the rest of the work being done independently; that work was shared and discussed through Twitter and Blackboard, the university's learning management system.

Students in this course came from various disciplines, including those who were majoring in Instructional Technology; Curriculum and Instruction; and Learning, Culture, and Society. The first author of this paper was the professor of record for the course. This section of the paper provides that professor's first-person description of the course context. Within this description, connections back to the theoretical framework provide rationale for course design and implementation.

Course Goals and Opportunities

To get the course approved by university administration, I wrote course goals. Those goals included the following: Students will . . .

- understand the nature of creativity as a process and as a mode of thinking and problem solving that can impact individuals, organizations, and/or society as a whole;
- explore a variety of avenues for rejuvenating their own creativity as well as the creativity of others in their charge;
- develop guidelines for applying creativity to their professional endeavors; and
- articulate connections between a sense of self (e.g., culturally, socially, spiritually, philosophically) and their inclinations toward (or away from) a creative lifestyle.

I did not list these mechanical goals in the syllabus. To keep true to Bain's (2004) notions of a "promising syllabus" (p. 74) and a "natural critical learning environment" (p. 99), both of which were mentioned in this paper's theoretical framework, I constructed a section in the syllabus that I called "Opportunities that this Course Provides":

> In many ways, creativity is at the heart of being effective. In the haste of the work-a-day world of deadlines, arising problems, and trials, it's hard to stay creative and renewed yourself, much less to inspire creativity in the work of others. This course provides you with a unique opportunity—to transform yourself into a more creative thinker and doer [and] change your own life and the lives of those who you lead. Sounds lofty, doesn't it? Accept the responsibility of embracing this opportunity by devoting yourself to the power of creative thinking! Make this a summer of personal and professional rejuvenation in your own ability to tap into the creativity that you have within you!

Course Textbook

The course textbook was Carson (2010). This text explicates various brainsets (i.e., different ways of thinking) that Carson says are essential to creative thinking. Each of Carson's brainsets is summarized in Table 1. Furthermore, Carson notes that "[m]apping the brainsets onto the appropriate stage of the [creative] process and learning to switch between brainsets" can provide "a big creative edge," including "greater self-actualization, enjoyment, and a richer inner and outer life" (p. 68). Also referenced in Table 1, then, are the stages of the creative process that are most commonly associated with each brainset. As can be seen, the Carson text was ideal for ensuring that students accept one of the demands that the theoretical framework suggests should be placed upon creators: Namely, the content in Table 1 helped students understand various types of thinking that were needed throughout the creative process.

TABLE 1. Carson's (2010) CREATES Brainsets.

Brainset	Summary Definition of Brainset	Stage of Creative Process where Brainset Occurs
Connect	Suspending judgment to make as many divergent connections as possible; complexity is the aim; to think of "possibilities rather than absolutes" (p. 126)	•Preparation •Incubation
Reason	Allowing for rational elaboration on ideas, such that logical, deliberate, and sequential results prevail	•Incubation •Elaboration
Envision	Controlling pictorial and symbolic images to generate additional sensory information	•Preparation •Incubation •Illumination
Absorb	To non-judgmentally take-in the world as we experience it	•Preparation •Incubation •Illumination
Trans-form	Setting aside negative feelings or acknowledging negative feelings toward the goal of making them the subject of one's work	•Incubation •Elaboration
Evaluate	Judging ideas within a domain of knowledge to distinguish quality from non-quality	•Elaboration
Stream	Improvising within a moment to produce responses to fluid challenges	•Preparation •Incubation •Illumination

Course Assignments

The course syllabus listed and explained the assignment categories. See Table 2. For some assignments, such as the "Bi-Weekly Reflection Journals," I gave students formal written guidance beyond the syllabus; still, the syllabus descriptions offer sufficient details about each assignment category. I designed each category of assignments to be consistent with the theoretical framework of this paper. For instance, note that all of the assignment categories contain a writing component. This is consistent with the theoretical framework's use of "writing to learn" as a tool for incubation and the demand that students must communicate in writing. Furthermore, because the assignments depend on students accessing their own voice, not depending on my professorial voice, the assignments undermine professor-centered classrooms. Instead, the assignments provide opportunity for students to demonstrate appropriate thinking strategies and risk vulnerability throughout multiple iterations of the creative process.

Grading, Assessment, and Feedback

Begrudgingly, to meet the university's administrative requirements, I did include percentages within the syllabus to give students signals about how they would be graded. As can be seen in Table 2, though, I couched those percentages in terms of the stage of creative preparation (i.e., "opportunity to immerse yourself" in the course), rather than the weighting of a grade. Some of the language within each assignment description intentionally places an assessment focus on qualitative process, as opposed to quantitative product. For instance, the "On-the-Go Creative Thoughts" were to be assessed based on students working themselves into a "sweet spot [of] seamless sharing." Similarly, the main criterion for the "Engaging Your Classmates" assignment was that students should be a "clear and constant presence" both online and during face-to-face sessions.

Throughout the course, peer feedback and assessment were constant. I constantly offered feedback and assessment, too, though I never graded any assignments. For instance, students submitted a weekly self assessment in which they, among other things, judged the extent to which they found "a sweet spot" of sharing their "On-the-Go Creative Thoughts" through Twitter. Because I followed all students on Twitter, I was able to offer my agreement or disagreement with their judgments. Where necessary, I also provided advice for improving the quality of their tweeted thoughts. Similarly, I commented heavily on students' "Bi-Weekly Reflection Journals." On some occasions, my commentary consisted of Socratic questions as a way of furthering students' thinking about their own work. In other cases, my commentary was based more in judgment about the extent to which students had offered thoughtful and creative ideas. I often tried to use my feedback to aim students toward appropriate thinking strategies, given my perception of the stage of the creative process in which they were operating. For instance, if students seemed too quick to verify an idea (i.e., stage 4 of the creative process) without appropriate incubation (i.e., stage 2 of the process), I would urge students to move away from Carson's (2010) evaluation brainset and toward the connecting and streaming brainsets.

METHODS

Data collection

On the last night of class, students (N=9) completed a two-part questionnaire that was designed to gauge their opinions about the course. The first section of the questionnaire listed each of the major activities within the course and asked students to "rank them in terms of the effect that they had on [their] creative thinking by numbering them from '1' (most important to promoting creative thinking) through '9' (least important in promoting your creative thinking)." The listed activities included (a) all of those shown in Table 2; (b) completing the weekly self-evaluation; (c) considering classmates' contributions to both Twitter and Blackboard; (d) reading the course textbook; and (e) reading additional articles about creativity.

In addition, the first section of the questionnaire asked students to rate three of their ranked items—specifically, the ones that they identified as most important (i.e., a ranking of "1"), middle importance (i.e., a ranking of "5"), and least important (i.e., a ranking of "9"). The questionnaire defined a five-point learning scale, where "'learning' is defined as promoting your creative thinking":

TABLE 2. Categories of assignments as described in the course syllabus.

Assignments to Promote the Opportunities
The best way to learn to become more creative is to take ownership of your learning. You must use all of the assignments in this course as an opportunity to immerse yourself in a new way of thinking. We will revisit these assignments during our second face-to-face meeting to see in what sense they are "working" for you, but this will be our starting point.
Morning Page Journal (10% of the opportunity to immerse yourself): Cameron (1992) says that "morning pages are the primary tool of creative recovery" (p. 11). Morning pages simply are "three pages of longhand writing strictly stream-of-consciousness" (p. 10). Because Cameron says that you should never show your morning pages to anyone (and that, perhaps, you shouldn't even go back and read them yourself), this component of the course will be assessed strictly through a weekly self-evaluation in which you report how many morning pages you have written. (On the first night of class, [the professor] will discuss Morning Pages in detail.)
On-the-Go Creative Thoughts (10% of the opportunity to immerse yourself): We will select an appropriate social medium (Twitter, Facebook, etc.) that will allow you to share your short thoughts on how immersing yourself is changing your daily thoughts as you go through life. What should you share? As you immerse yourself, you will begin seeing things, hearing things, observing things, and thinking about things in a new way. Make it concrete. Maybe your thoughts are lines of poetry. Maybe they are simple observations. Maybe they are sudden "a-ha" flashes that jump up from your unconscious. Maybe they are connections from this class to other classes. The sweet spot to work yourself into is a seamless sharing of your natural thoughts that show a connection to (or grounding in) creative thinking.
Bi-Weekly Reflection Journals (30% of the opportunity to immerse yourself): You can largely think of these journals as "reading journals," though they absolutely should allow you to wrap a nice package of ideas from your morning pages, on-the-go creative thoughts, and project ideas. These reflection journals will be posted in designated Blackboard discussion boards. (See separate assignment guidelines located in Blackboard under "Syllabus.")
Engaging Your Classmates (30% of the opportunity to immerse yourself): You have obligations to the creative life of your classmates and your professor. This engagement consists of replies to your classmates' ideas. Some of these replies might come through your vigorous participation in face-to-face sessions. But, you also have an obligation across the twelve weeks of the semester to be a "clear and constant presence" in the lives of your classmates by replying virtually to them. This can be done by a combination of replying to your classmates' on-the-go creative thoughts and through replies in the Blackboard discussion boards. (See the separate assignment guidelines located in Blackboard under "Syllabus.")
Course Project (20% of the opportunity to immerse yourself): You will complete a course project. That course project could take a variety of forms (e.g., research paper, curriculum development, multimedia project, a piece of fine art, presentation, etc.). Your project must meet the following criteria: • Meets the definition of "creativity" • Emerges somewhat from your developmental thinking throughout this semester (as evidenced in your Morning Pages, On-the-Go Creative Thoughts, Bi-Weekly Reflection Journals, and Engaging Your Classmates Activity) • References academic readings on creativity (i.e., there should be a lit review component) • Serves some meaningful role within your career or personal life • Is of the scope and quality that you feel is appropriate for 20% of a course grade in a graduate-level course Additional criteria might be negotiated depending on the exact nature of your project.

0 = felt like a waste of time. It did not contribute to my learning.
1 = was vaguely useful, contributing only loosely and superficially to my learning.
2 = contributed moderately to my learning.
3 = was a good learning experience.
4 = was extremely useful to my own learning.

The second section of the questionnaire contained sixteen Likert-scale items. The five-point scale ranged from strongly disagree (coded as -2) through strongly agree (coded as 2), with the middle item reading "Neutral; not sure" (coded as 0). The exact Likert-scale items will be discussed in the next section of this paper. Importantly, though, some of the items correspond to the seven brainsets identified by Carson (2010). Other items were based upon this paper's theoretical framework, such as the demands placed upon creators. One item, for example, asked if students "allowed [themselves] to be vulnerable" and "relish in operating outside of [their] comfort zone." This item corresponds to the third demand: Creators must risk psychological vulnerability.

Data Analysis and Results

Ranked Data (First Section). Table 3 contains an analysis of the questionnaire's first section. In addition to the usual descriptive measures (i.e., mean, standard deviation, median, minimum, and maximum), Table 3 reports t-tests for each item, the purpose of which is to discover whether the class' average rankings were statistically different from middle importance (i.e., a score of 5). Table 3 also reports results from the Wilcoxon signed-rank test.

As shown in Table 3, both the t-test and the Wilcoxon test agree that only three course activities were ranked, on average, significantly different from middle importance. Specifically, "writing the bi-weekly reflection journals" and "Reading the Carson textbook" were ranked significantly above middle importance (as a lower mean indicates a higher rank), while "Completing the weekly self-evaluation" was ranked statistically below middle importance (as a higher mean indicates a lower rank). All other activities were not statistically different from middle importance.

On an individual basis, students did perceive that certain activities were significantly more meaningful to their creative thinking than other activities. Table 4 reports Kruskal-Wallis test results for students' first, middle, and least important activities (i.e., ranks 1, 5 and 9 on the aforementioned five-point learning scale). The Kruskal-Wallis test statistic (10.596) is statistically significant at the α= 0.01 level, meaning that at least one of the samples (first, middle or least) is different from the others. This result paired with the Wilcoxon Scores (also shown in Table 4) suggests that students perceived that their higher-ranking activities (whatever they may be) promoted more creativity than their lower-ranking activities.

Likert Items (Second Section). Table 5 includes the phrasing for each Likert-scale item and contains an analysis of each item. Like Table 3, Table 5 includes the usual descriptive measures along with t-test and Wilcoxon signed-rank test results. However, in Table 5 there are sixteen items (rather than nine) with scores distributed around a midpoint of 0 (rather than 5).

TABLE 3. Course activities ranked by effect on creative thinking.

								Tests for location H_0: μ=5			
		Descriptive Statistics						Student's t		Wilcoxon's Signed Rank	
Rank (based on class mean)	Activity	N	Mean	Std. Dev.	Median	Min	Max	t	p>|t|	S	p≥|s|
1	Reading the Carson textbook	9	2.000	1.118	2	1	4	-8.050	0.000***	-22.5	0.004***
2	Writing the Bi-Weekly Reflection Journals	9	3.333	1.581	3	1	6	-3.162	0.013**	-16.0	0.031**
3	Tweeting on-the-go creative thoughts	9	3.889	2.571	3	1	7	-1.296	0.231	-11.5	0.188
4	Completing the course e project	9	4.444	2.555	1	1	8	-0.652	0.533	-5.0	0.555
5	Reading other articles/websites/etc. on creativity	9	4.556	1.944	4	2	8	-0.069	0.512	-3.5	0.609
6	Replying to others in Backboard	9	4.556	2.506	4	1	9	-0.532	0.609	-4.0	0.633
7	Reading classmates' thoughts in Twitter and Backboard	9	5.333	2.291	6	2	8	0.436	0.674	3.0	0.781
8	Completing Morning Pages	9	5.333	3.041	5	1	9	0.329	0.751	3.0	0.077
9	Completing the weekly self-evaluation	9	7.667	2.598	9	1	9	3.079	0.015**	16.0	0.055*

*** significant at α = 0.01; ** significant at α = 0.05; and * significant at α = 0.10.

TABLE 4. Wilcoxon scores (rank sums) for learning classified by importance rank.

Rank	N	Sum of scores	Expected under H_0	Expected std dev under H_0	Mean Score
Most	8	149	100	15.692	18.625
Mid	8	88	100	15.692	11.000
Least	8	63	100	15.692	7.875

A more substantive difference between Tables 3 and 5, however, is the volume of statistically-significant results in the latter. At the α = 0.05 level or better, 15 of the 16 items in Table 5 have statistically significant t-tests; 14 of 16 have statistically significant Wilcoxon signed-rank tests. The one item without a statistically significant t-test is item 7 ("This course did a better job of teaching me about creativity than it did in helping me promote my own creativity."). That same item also lacked significant Wilcoxon test results, as did item 14, which dealt with Carson's (2010) "transform" brainset.

The statistical results in Table 5 suggest that—among other things—students believed that the course "led to opportunities to harness the power of creativity" and was more "immersive than a 'typical' graduate-level class" (item #2). The course also allowed students to transform themselves into more creative thinkers (item #1). Furthermore, the course promoted students (a) reflecting on their own commitment to become more creative (item #3); (b) harnessing the power of "writing to learn," as they were able to "figure stuff out" through writing (item #4); (c) taking risks and being vulnerable (item #9); and (d) developing Carson's (2010) connect, reason, envision, absorb, evaluate, and stream brainsets (item #10-13 and #15-16).

TABLE 5. Kruskal-Wallis test.

Chi-Squared	10.596
DF	2
P > Chi-Squared	0.005***
*** significant at α= 0.01	

DISCUSSION

As a context for this discussion, a consideration of the low number of questionnaire respondents is important. It might be easy to dismiss this study altogether because of the low N. Importantly, though, the lower the N, the more difficult it is to reach statistical significance (see, for example, Minium & Clarke, 1982, p. 276). The places where statistical significance is achieved, then, should be viewed as substantive and noteworthy. This discussion section is organized around the ranked assignments and Likert-items.

Ranked Assignments

At statistically-significant levels, students in the course were overwhelmingly positive about both reading the Carson (2010) text (class-wide mean rank of 2.0) and writing the bi-weekly reflection journals (class-wide mean rank of 3.3). On our first consideration, these findings were disappointing to us. After all, reading a textbook and writing journals seemed to be the least creative assignments in the course. They also seemed most comparable to work that occurs in many college classrooms. We were hoping that students would judge the seemingly more novel strategies (e.g., sharing "On-the-Go Creative Thoughts" through Twitter and writing "Morning Pages" to capture fleeting and stream-of-consciousness thoughts) as being primarily important in promoting their creative thinking.

Three points mitigate our disappointment. First, statistically speaking, students did not disvalue the use of these more novel strategies when measured by their rankings; they just did not value them as highly and with as much uniformity (i.e., low standard deviations) as they did the Carson (2010) text and reflection journals. Second, as previously noted, some literature suggests that the exclusive use of the verbal domain limits students' abilities to demonstrate creative capacity. Yet, the results of this study indicate that reading and journal writing had a significant impact on students' creative thinking. Certainly, the results do not show that the verbal domain is superior to other domains; they do show, however, that the verbal domain should not be discounted as a means for promoting creative achievement. Third, the results of this study support an established view about the usefulness of reading in conjunction with writing within the college classroom (see, for instance, Blackmore, 2002; Fitzgerald & Shanahan, 2000; Knowlton, Heffren, Fish, Eschmann, & Voss, 2004; Knowlton & Sharp, 2012; Sharp, Knowlton, & Weiss, 2005; Wittrock, 1974). However, past academic literature has defined "usefulness" in terms of combining reading and writing to support meaningful learning. The possibility that reading and writing supports creative thinking (a different construct from typical definitions of learning) is insightful, as we have found no literature empirically establishing this connection within the college classroom.

Particularly with regards to the bi-weekly reflection journals, further consideration is needed. The journals could be seen as a valuable instructional strategy for promoting creative achievement. But, the journals also could be seen as a culminating piece of a larger creative system. Both perspectives are reasonable, as Guenther (1994) lists instructional strategies and a systematic environment as parallel elements of teaching for creativity. Each perspective is discussed in turn.

In considering journals as an instructional strategy, it might be important to note novel details of the assignment description. Perhaps it is the construction of the journal assignment that was the impetus for creative thought. For instance, the assignment guidelines noted that "length and formality of language are irrelevant": "Do not think of Reflection Journals as formal papers of a certain length that must be revised, edited, and polished." Instead, students were urged simply to "think on paper" and "get [their] ideas 'out there' in ways that indicate a true attempt to 'grapple' with difficult ideas." Such instructions are consistent with "writing to learn" as a means of deliberate incubation. Furthermore, in keeping with Halpern's (2010) finding that students should be told that creativity was needed, the assignment instructed students to judge their own journal through a criterion question: "Is there true novelty, usefulness, bravery, risk-taking, substance, playfulness, and so forth?" Indeed, the assignment guidelines noted that one of the harshest criticisms that the professor could offer about a student's reflection journal was to note that it "simply fulfilled the assignment" or that it felt "safe" and "pedestrian." In total, these guidelines promote a lack of professor-centeredness. As a strategy, journals are insular, solitary, and student centered; they are meant to get inside

TABLE 6. Likert items.

	Descriptive Statistics						Tests for location H0: μ=0			
							Students' t		Wilcoxon's Signed Rank	
	N	Mean	Std. Dev.	Median	Min	Max	t	p>|t|	S	p≥|s|
1. In this class, I transformed myself into a more creative thinker.	9	1.444	0.527	1	1	2	8.222	0.000***	22.5	0.004***
2. I view this class as an immersive experience that led to opportunities to harness the power or creativity; it was more immersive than a "typical" graduate level class.	9	1.556	0.726	2	0	2	6.424	0.000***	18.0	0.008***
3. This course cause my to have "honest conversations with myself in the mirror" about my own commitment to enhance creativity.	9	1.444	0.527	1	1	2	8.222	0.000***	22.5	0.004***
4. I experienced "writing to learn" in this class. I would discover what I was trying to say *while* writing. Writing helped me "figure stuff out."	9	1.889	0.333	2	1	2	17.000	0.000***	22.5	0.001
5. This course was meaningful to me.	9	1.444	0.726	21	0	2	5.965	0.000***	18.0	0.008***
6. This class has an emotional component to it that was productive.	9	1.000	0.707	1	0	2	4.243	0.003***	14.0	0.016**
7. This course did a better job of teaching me *about* creativity than it did in helping me *promote my own* creativity.	9	0.000	1.323	0	-2	2	0.000	1.000	0.0	1.00
8. Because of this class, I will be a more creative teacher and/or leader.	9	1.444	0.527	1	1	2	8.222	0.000***	22.5	0.004***
9. In this course, I took risk, allowed myself to be vulnerable, and tried to relish in operating outside of my own comfort zone.	9	1.222	0.441	1	1	2	8.315	0.000***	22.5	0.004***
10. In this class, I developed my skills in the **Connect** Brainset.	9	1.444	0.527	1	1	2	8.222	0.000***	22.5	0.004***
11. In this class, I developed my skills in the **Reason** Brainset.	9	1.222	0.833	1	0	2	4.400	0.002***	14.0	0.016**
12. In this class, I developed my skills in the **Envision** Brainset.	9	1.556	0.527	2	1	2	8.854	0.000***	22.5	0.004***
13. In this class, I developed my skills in the **Absorb** Brainset.	9	1.778	0.441	2	1	2	12.095	0.000***	22.5	0.004***
14. In this class, I developed my skills in the **Transform** Brainset.	9	0.750	0.886	1	-1	2	2.393	0.048**	10.5	0.110
15. In this class, I developed my skills in the **Evaluative** Brainset.	9	1.000	0.707	1	0	2	4.243	0.003***	14.0	0.016**
16. In this class, I developed my skills in the **Stream** Brainset.	9	1.4444	0.053	1	1	2	8.222	0.000***	22.5	0.004***

*** significant at α = 0.01; ** significant at α = 0.05; and * significant at α = 0.10.

the student's head. This allows for the elevation of student voice.

Viewing journals as mere strategy contrasts the seeming importance of the systems view of creativity. Liu and colleagues imply the need for strategies to be situated within a creative environment (Liu, Lin, Juan, & Liou, 2012). Therefore, journals better might be considered as an effective culminating point within a classroom system that valued creativity. After all, the assignment emphasized the need for "specific and detailed connections from the course readings to elements beyond the reading." The assignment guidelines noted that these beyond-reading elements might include the other

course assignments listed in Table 2. When viewed from this perspective, the value of the journals can be seen as a piece of a larger system that supported students' creative thinking throughout the stages of the creative process. Related to the stages of incubation and illumination, for instance, perhaps the journals were not a strategy for deliberate incubation that leads to insights through "writing to learn." Instead, it is plausible that unconscious deliberation and illumination occurred in the psychological space between completing other assignments and journal writings. To students, writing the journals seemed valuable as a means of fostering creative insight; but illumination might have occurred prior to journal writing, and students only realized those pre-formed insights as they bubbled up from the unconscious while writing journals. Certainly, this speculation fits with the earlier-described view that illumination seems to sometimes happen through unexplainable inspiration.

Likert Items

Earlier in this paper, we pointed out that the low number of respondents on the questionnaire inherently made statistical significance less likely. Thus, significant findings should be treated as particularly noteworthy. Indeed, from a quantitative empirical perspective, given this study's low N, it is astounding that 15 of the 16 Likert-scale items had statistically-significant t-tests and 14 of the items had statistically-significant Wilcoxon signed-rank tests. These findings become even more remarkable if one considers the nature of some of the questions earning statistical significance: Students, through this course, felt that they "transformed [themselves] into more creative thinkers" (item #1); had an "immersive" (item #2) and "meaningful" (item #5) experience; found an "emotional component" to their learning (item #6); and "relished in operating outside [their] comfort zones" (item #9). These results contradict a commonly-held view that college courses dispassionately and clinically promote the mere acquisition of knowledge. Students did not judge this course as being one of teaching them about creativity; instead, it promoted their creativity (as evidenced by a lack of statistical significance in item #7).

In many classrooms, professors and students enter into an implicit "non-aggression pact" (Sperber, 2000, p. 112) of not asking much of each other or themselves. It often is the professor who, knowingly or unknowingly, first extends a metaphorical hand for students to shake in agreement on the pact (Hagopian, 2013). This study provides some evidence that professors who set aside this pact can create a classroom system that meaningfully promotes creative achievement. Particularly in an age where students might be more inclined to claim their entitlements than to aim toward meaningful experience (see, Hagopian, 2013), it is reassuring to know that such a system is possible.

The Likert-scale items required students to judge the course holistically, as a system for promoting creative achievement. We assert, then, that students' perspectives should be credited to the careful construction of that system. The elements of the system are discussed in both this paper's theoretical framework and within the course description. In direct response to Sperber's (2000) "non-aggression pact" (p. 112), here we emphasize the power and value of a course system placing appropriate demands upon students—the demands of (a) quantity as an avenue to quality, (b) communicating through writing, (c) being flexible in thinking approaches across a range of creative processes, and (d) risking vulnerability. And these demands, it is worth noting, were placed within a classroom system that overtly undermined both a professor-centered classroom model and the use of grades as a marker for students' self judgments.

The fact that students did not think that they developed their skills in Carson's (2010) transform brainset (i.e., item #14 was not statistically significant on the Wilcoxon signed rank test) furthers the perspective that the classroom system described in this paper was successful. Because the course was an immersive (item #2) and meaningful (item #5) experience that allowed students to use writing to "figure stuff out" (item #4), students were never allowed to develop doubts, negative emotions, and unproductive self-consciousness that are necessary as a precursor for needing the transform brainset. This line of thinking supports the view that the classroom system led to a type of positive flow for students. And, as Csikszentmihalyi (2008) notes, when one is in a state of flow, self consciousness and self doubt cannot prevail because all of one's focus is placed on achieving the creative task at hand. No room is left over in consciousness to feel the negative emotions that make the transform brainset necessary. Carson's advice is to only enter the transform brainset "temporarily" when one "need(s) to harness emotion" (p. 221). If immersion leads to flow, and if flow prevents negative self consciousness, then the need for the transform brainset is rendered unnecessary. Of Carson's brainsets, transform is the only one that interrupts flow; all of the others as described in Table 1 support flow.

IMPLICATIONS

This paper has served the purpose of examining students' perceptions of the value of assignments within a graduate-level course on creativity. This paper also has substantively shown that students found the course to holistically serve as a system that promoted creative achievement. Various elements of this paper have implications for both course design and future research.

Course Design

This paper has implications for the design of higher education courses that have creative achievement as a partial or sole goal. For instance, this paper's theoretical framework points to problems that are inherent to traditional college classrooms. When creativity is a course goal, course designers would do well to minimize the role of academic tradition in terms of both the importance of a dominant professor voice and grades as measure of, and marker for, achievement. Replacing this tradition with an emphasis on creative processes that place demands upon students as creators could be useful.

Similarly, the course description provided in this paper can serve as a model upon which future courses might be based. For instance, if course designers agree with this paper that a range of thinking strategies will benefit students as they aspire to achieve creatively, then Table 1 can serve as a heuristical aid that helps course designers integrate various brainsets into course activities. Also, Table 2 can serve course designers as they consider possibilities for assignments. For instance, given the statistical-significance of the power that students found within the "Bi-Weekly Reflection Journals," course designers might consider adopting journal writing to promote creative achievement.

Three relevant points were made in this paper that might in-

fluence course designers' decisions about journals. First, if course designers believe that the verbal domain is too limited to provide opportunity for creative achievement, then perhaps integrating Carson's (2010) envision brainset into journaling assignments could be useful. Because Carson says that envisioning might be more visual than verbal, such an approach could broaden the domains that students draw upon in their learning. Second, if course designers see journals as an isolated instructional strategy, then they might consider aiming students toward a writing-to-learn approach where formalities of language are de-emphasized and the use of language as an informal tool for "grappling" with ideas is emphasized. Third, and somewhat in opposition to the first two points, if course designers understand the success of journals to be related to a systems view of creativity, then the specifics of the assignment might be less important than how the journals are situated within the classroom system. In this case, course designers should focus on the relationship between the journals and other aspects of the classroom system. In sum, these three points illustrate the need for course designers to think carefully about assignment selection and construction.

Future Research

The quantitative results presented in this paper are useful and robust. Still, more research is needed. Examining students' perceptions of creative achievement through qualitative research could add additional profound dimensions to topics addressed within this paper. The theoretical framework and course description are rife with ideas that could be explored through student interviews, case studies, and ethnography. Example questions might include the following:

- In what ways do students come to understand the creative process as an application for classroom learning?
- How do students navigate the demands of taking psychological risks and being vulnerable within a creative experience?
- How do students' thinking approaches across the creative process align (or not align) with Carson's (2010) recommended brainsets for each stage of that process (i.e., Table 1)?
- Through what means do students adjust to a classroom environment that undermines professor centeredness and grades?

Beyond these questions, qualitative research can provide more insights into topics that are directly related to the findings and discussion sections of this paper. For instance, research should qualitatively explore students' experiences with reflection journals as a tool to promote creative thinking. Some of this research might focus on content analyses of the journals themselves. For instance, the content of students' connections from a reading to beyond-reading content could provide insights into which of Carson's (2010) brainsets are most commonly used. Other research might more fully explore students' beliefs about journals and their role within the creative process. For instance, do students feel limited by the verbal domain that is so prevalent in journal writing? Similarly, do students understand the value of journals as an isolated stand-alone strategy, or do they think of journals more as an element of a creative classroom system?

Both the theoretical framework and discussion sections of this paper suggest the importance of systems for promoting creative achievement. Systems are complex. They do not depend merely upon the individual elements that comprise the system; they also depend upon the arrangement and ordering of those elements (Morrison, Ross, Kalman, & Kemp, 2011). Qualitative research could provide insights into how a complex system plays out from the students' perspectives. Specifically, emphasis could be placed on various elements from the Likert-scale items. For instance, what is the relationship among experiences of creative transformation (item #1 from Table 5), immersion (item #2), finding meaning (item #5), understanding emotional components (item #6), and taking risks (item #9)? Certainly, some quantitative analysis could consider the causes of some of these items. But, perhaps more importantly, qualitative research could provide insights on how students directly experience the various elements of the system and how they understand the impact of those elements as they pursue creative achievements.

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