

1 13 The Creativity Habit

2 *Brad Hokanson and Marit McCluske*

3 Introduction

4 Imagine you are taking a new class and at the first session, as one of 80
5 students, you are given a banana or an orange. Before you start to eat, you are
6 asked to peel your fruit in a way that is different from how you ordinarily do,
7 and in an unusual manner, and to sketch your efforts as you proceed. While
8 you're familiar with the fruit, you've never given much thought as to how to
9 be creative in this ordinary part of your life. This is the start of a different form
10 of thinking in the class, one that will continue with a series of challenges and
11 exercises to increase your personal creativity. The first assignment will build on
12 this; it is to eat something different, and it is the first of a series of challenges
13 called "differents" that encourage divergence through your entire life.

14 How this course, Creative Problem Solving, is taught, and how it has
15 developed, is the focus of this chapter.

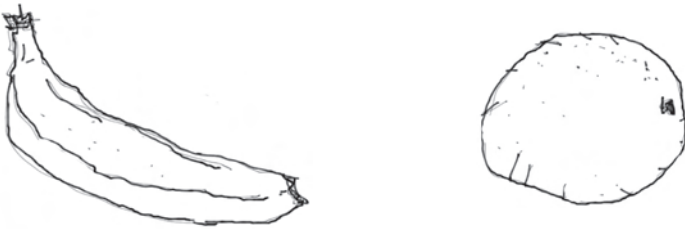
16 I knew this course on creativity was unusual... let's say different... the first
17 time it was offered. Sometimes a course will have a life and power all its own,
18 much like a novel or poem has its own momentum, and this certainly has
19 been the case with Creative Problem Solving. In the middle of teaching the
20 class for the first time, I was walking through the college administrative area
21 and the assistant dean asked me if I was teaching a cult. Puzzled, I asked what
22 prompted her question. It turned out that, independent of my knowledge,
23 my students had all decided to wear aluminum foil in a class to which I was
24 a visiting lecturer. Some had foil skull caps, others aluminum ribbons in their
25 hair, and some wore foil jewelry. They were expressing their individual crea-
26 tivity while declaring their solidarity with me and with each other - and their
27 difference from everyone else in the class. My understanding, both of the
28 course and of aluminum foil, was changed substantially. Students were and
29 continue to be enthused about how the course changes their creativity and
30 thinking processes.

31 Having taught for years in the design fields - in architecture, in graphic
32 design, and in instructional design - I've come to understand that creativity
33 does not develop spontaneously, even in design or studio courses, but must
34 be specifically addressed as a topic. At the same time, many aspects of the
35 studio environment are critical, such as the action-oriented and direct

π 1.22.15

Name: _____

How did your peel your fruit differently? [write and diagram your idea and what you did]



banana

orange

Figure 13.1 Idea capture form, from first day of class. Brad Hokanson.

1 personal involvement of learners. It was in my college and graduate studio
 2 courses where I had the opportunity to be inventive and divergent, which
 3 helped me develop my creative capabilities. This time in studio has inspired
 4 my teaching methods.

5 The studio format was the constant, a structure for learning and working.
 6 Studio was always a presence, a way of life, and then there were other classes.
 7 That was true in art, in architecture, in urban design, and in instructional
 8 design. I'm not sure if I was *taught* design, but rather I was in an environ-
 9 ment where I *learned* design. No one ever said, "Here's what an idea is. You
 10 should have one." It was something you discovered. The challenge of design
 11 centered around a guiding concept, which was central to a lot of my learning.

12 The necessity for creativity, for human ingenuity, is without doubt.
 13 Creativity is a skill that can be employed for a small task or for a large project
 14 and in everyday life. Creativity is important in any field, from business to
 15 mathematics, from engineering to the arts. Businesses around the world
 16 recognize this skill as essential and seek out the most creative workers for
 17 their enterprises. It's also recognized through the achievements of a lifetime;
 18 research has shown that creativity is three times as strong an indicator of
 19 future lifetime achievement than intelligence (Plucker 1999). The goal of
 20 this course and this proposal is to increase the creativity of each student.

21 This course is looked on as a continuum; as a set of projects that act
 22 together, like a longer-term treatment. The real goal of the class, to develop
 23 creativity, can be seen in the various aspects of the projects and exercises; to
 24 develop the ability and habit of generating more ideas (ideational fluency); to
 25 develop the capability of finding, refining, and stretching problems, leading
 26 to different types of solutions (ideational flexibility); and to build a capability

1 to keep (retain, save, select) and develop ideas that are unusual and unex-
2 pected (originality). Developing a *habit to vary* will continue the impact of
3 the course; recent research has shown increases in measured creativity are
4 retained after two years (Im *et al.* 2015).

5 Understanding the nature of how any course is developed, presented, and
6 improved has great value to education and the design of instruction. From
7 our writing, we hope to better that understanding and to build our own
8 classes and knowledge. The authors are the lead instructor of the course and
9 a former graduate teaching assistant for the course. Most of the narrative is
10 by the lead instructor, Brad Hokanson, with additional discussions in the text
11 boxes by Marit McCluske.

I was a teaching assistant for four semesters in the course, teaching six different sections of the course. At the time, I was a graduate student completing my MFA in graphic design, and I'm currently a faculty member in graphic design and I teach an interdisciplinary design thinking and creativity course developed from parallel research to this class.

12 The Idea

13 From the beginning, the central concept of the course was not to *teach*
14 students *about* creativity, but rather to *train* them to *be* more creative. This
15 changes the nature of the course from presenting information about creativ-
16 ity to trying to consciously change the character of the learners and, over
17 time, to build their creative skills. This is our calling, since creativity among
18 US schoolchildren, as measured by the Torrance Test of Creative Thinking,
19 has declined significantly since 1991 (Kim 2011). The opportunities to
20 become creative as a child have decreased just when the value of creativity is
21 being most recognized.

22 So I *teach* a class that is different from most, different in many ways, not
23 least in the process of how it is done and how much of what I work on can
24 be considered “training.” My goal is to build a series of self-directed habits
25 for creativity, a habit to vary. This would be a different conceptualization for
26 any course. It is a course that is experiential, not abstract or mediated.
27 Learners do the “differents” themselves, in person, reporting back to the
28 class about their experiences and process.

29 Most design faculty believe that creativity develops within their design
30 studio, not recognizing creativity as a separate skill with a need to be
31 explicitly taught. Based on my research, creativity does increase in studio
32 courses somewhat, but not to the extent that it does with dedicated
33 instruction. Teaching specific design skills often drives out the general
34 creativity skills.

1 All parts of the course are used to develop creativity; from warm ups, to
2 demonstrations, to exercises, to taking attendance. Assignments are inte-
3 grated into students' everyday lives, changing how they eat, how they talk
4 with others, and what they wear. In every session we do exercises and activi-
5 ties in class, and learners are pushed to generate more ideas. Every week they
6 do something... Different. Repetition, development of positive habits, and
7 conditioning all play a part in the course curriculum.

Effective communication of the relationship between the learner and the idea being presented becomes paramount to the success of each project. Almost every discussion session would involve some type of exercise designed to facilitate effective communication of creative ideas. Group exercises helped develop greater understanding of empathy and the personal realm of creative possibility of another: What is deemed creative for some is routine for others.

8 More than the development of declarative knowledge, this course seeks to
9 improve the skills of learners, showing them methods of generating new
10 ideas. It builds the habits of learners to produce long-term systems that
11 encourage creativity, and it works to change the beliefs of learners about their
12 own creativity and their own limits.



Figure 13.2 Wearing Something Different. Marit McCluske.

1 Being more creative comes from a set of characteristics, including knowl-
2 edge, beliefs, skills, and habits. In this course knowledge, the traditional lead
3 component of most university courses, is the least important aspect.

4 **Belief**

5 Belief comes from our experiences and exposure to ideas as well as our posi-
6 tive opportunities to be creative. The most important component of being
7 creative is a belief in our own creative capability, and that creativity is present
8 in us all. Importantly, our level of creativity can be increased if we choose to
9 do so. However, our belief in creativity must be followed by acting in ways
10 that help us to develop that creativity by challenging our assumptions and
11 personal limits. All of us are often constrained in what we can do by what we
12 believe and by our social context.

13 Therefore, much of the effort in building one's own creativity is to
14 develop the courage and persistence to be divergent; the ability to withstand
15 the judgment of others. As most new ideas are unpopular, there is a natural
16 tendency to continue with the existing status quo. To bring forward ideas,
17 one needs to have the capacity to experiment and try new things, often at
18 the risk of not succeeding or being embarrassed.

19 Vygotsky (1978) held that learners can only learn material for which
20 they are intellectually ready, only accepting new information "adjacent"
21 to their own understanding. Similarly, learners in this class are often
22 constrained by societal and personal pressure to conform to existing stand-
23 ards of behavior and response. Excursions outside of expectations are
24 self-edited or repressed. Most times, students cannot be *that* different from
25 the norm. A conscious effort to extend student responses into the devel-
26 opmental zone will enable later responses, effectively building a callus, not
27 a scar, for the learner. We seek, in the class, to stretch the personal envelope
28 of each student.

There are generally two groups of students that make up a class. One group consists of those that have a conscious need or desire to develop their creative thinking skills, often approaching their weekly Do Something Different (DSD) with a defined problem to solve. The second group of students are often much more hesitant and timid at the beginning of the semester due to the divergent nature of the course. A distinct sense of fear is apparent upon asking them to do something out of their comfort zone. What quickly evolves from this mix is the empathy needed to approach problems from multiple points of view. The nature of the course allows for a culture of empathy to exist in an environment typically lacking in personal engagement.

1 Skills

2 The specific *skills* of creativity need development, whether in the process of
3 making something habitual or in the conscious use of a creative methodol-
4 ogy. Practice in using creativity techniques will make skills more habitual,
5 even for the simplest task of generating more ideas. At first, there are personal
6 limits to how many concepts or ideas an individual student can develop, but
7 the ability to create more will come through practice. Methods for creativity
8 must be internalized and be part of the student's everyday experience.

9 Generating a lot of answers involves both inspiration and the ability to
10 withhold judgment. Each class has an exercise or a drill to generate a lot of
11 ideas. This is both a practice within the classroom and a presentation of the
12 various methods of idea generation for the student to use long after the
13 course has concluded. Exercises gleaned from a range of creativity techniques
14 are used and include brain writing (rapidly generating multiple answers),
15 random-word stimulation (answers triggered by a random word), mind
16 mapping (graphically representing idea connections), and random-image
17 stimulation. An online and mobile phone app has been developed to
18 continue this practice away from the classroom.

19 One successful method for generating multiple ideas is the Attribute
20 Listing method. It begins with an existing object or process, from which a
21 listing of every possible attribute is generated. This includes functional,

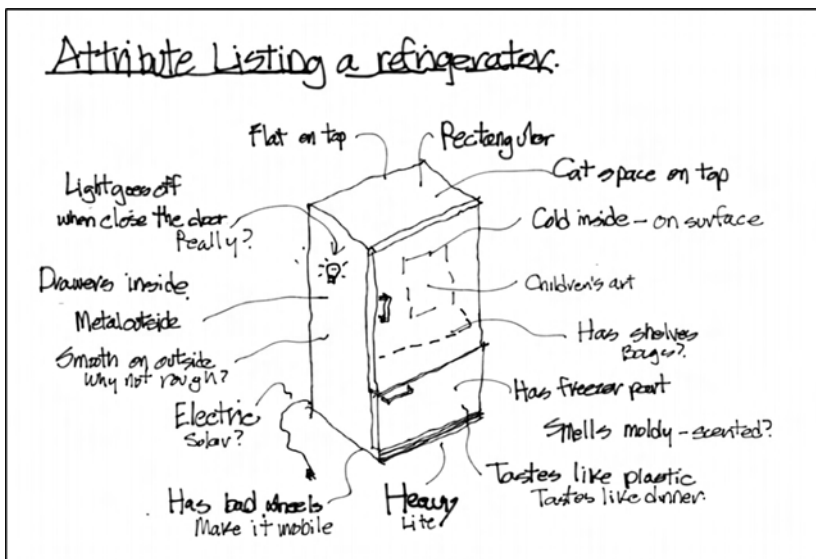


Figure 13.3 A sketch depicting an Attribute Listing exercise. In the exercise, attributes of an object or process are listed, then changed to generate new ideas. Brad Hokanson.

1 visual, acoustic, taste, and smell. Each attribute is then changed in some
2 manner to create a new product idea. For example, the refrigerator door that
3 has children's art display space can be transformed to hold and display new
4 digital art... or recipes. Also the smell of what's been in the refrigerator can
5 be sniffed by the appliance itself: "Maybe it's time to change the baking
6 soda!" the refrigerator of the future could tell you.

Students practice idea generation tactics for fluency, frequency, and originality, and students are able to see how they compare and just how much improvement may be needed. Much of the course is re-learning the creative thinking skills they may have once had, and within a school setting. Therefore, I would draw on a lot of research from games and play to help mediate group work. Sometimes too much focus is placed on the "challenge" aspect and students forget to realize that a part of creativity is curiosity, playfulness, and fun.

7 I would often have students engage in short design prototyping experi-
8 ments in which one sense (sight, hearing) is substituted for another. Students
9 would generate alternative uses of an object or a space, and then redesign an
10 experience for a partner in which the primary sense engaged is swapped for
11 another. Alarm clocks, way-finding signage, and cell phones were reinter-
12 preted, designed to emulate how children experience the world through
13 multi-sensory engagement, or how visually impaired users can navigate a
14 space through sound. The goal was to generate a large range of ideas that
15 explore how a routine habit could be creatively altered by altering the
16 primary sense engaged.

17 Habits

18 While often viewed as restricting creative action, regular *habits* can work to
19 develop, demonstrate, and increase creativity. These types of habits include
20 consistent development of multiple divergent ideas, regularly providing more
21 responses than are required, involving oneself in challenging and different
22 activities, and consistently seeking to be more creative. Assumptions and
23 personal limits on action can be addressed and overcome at the same time.

24 Perhaps the most important habit for learners to develop is the *habit to*
25 *vary*; habitually doing divergent things, taking on new challenges as a matter
26 of course, and extending one's limits. We can vary many things in our lives,
27 from the routes we travel, to our music choices, to what to have for dinner,
28 with positive effects on our creativity.

29 The large assignments, the "differents", of the course are designed to
30 change student habits; to encourage them to move past their current habits of
31 what to eat, how to sleep, and what to wear, and to develop in them a larger

1 habit of adventure and exploration. This takes time and repeated practice and,
2 of course, it requires doing something different.

3 **Differents**

4 While the course has changed a lot over the years, the overall direction was
5 set from the beginning as a course that trained the students to be more crea-
6 tive through a series of challenges to “do something different.” These differ-
7 ents can be seen as starting points for becoming original and creative.

8 Many ideas for the course were inspired by teaching I did with Gerry Allan
9 at the Minneapolis College of Art and Design in the early 1980s. Early
10 instances of differents were used in general studio classes for art and design
11 students. Each Different or DSD is organized along a specific theme, such as
12 eating, talking, or giving. We begin the differents with changing everyday
13 activities, such as what to wear or how you travel to your home, and increase
14 the complexity to be more reflective and engage with others.

15 The differents begin with basic challenges that can be minor changes to
16 one’s regular habits or more substantial redefining of a problem. Subsequent
17 challenges are more complex and reflective, pushing the learners to directly
18 think and examine their own lives. They include doing something your
19 “other” does that you never do; remembering something you did as a child;
20 finding somewhere to sit without electronic stimuli and then listen for an
21 extended period of time; and selecting one of the previous DSDs to re-do.
22 Perhaps the most personally challenging externally related DSD is to “give”
23 something different.

24 The first challenge is often to eat something different. Entering college
25 provides a number of opportunities for students to change dietary habits and
26 to explore new foods. For this project, many students immediately seek out
27 different ethnic foods. Some manipulate their current eating pattern by
28 wearing their food, eating it upside down or under water, or reshaping or
29 blending their normal diet. The more adventuresome expand eating to go
30 beyond traditional foods and consume flowers, twigs, ants (as a garnish to
31 chocolate-covered strawberries) or grass. The most exploratory answers
32 involve redefining the challenge, as students end up eating their words, or
33 eating breakfast in the back of a police car, or eating pineapple upside-down
34 cake ... upside down.

35 One of the more memorable examples of an “eat” something different was
36 a student who made pancake batter - from dry ingredients, oil, and egg - in
37 his mouth. After mixing thoroughly, he spat it out on the grill for cooking
38 and later consumed the finished pancake. With syrup. And relish.

39 In an online version of the course, one student from Cambodia noted she
40 often ate tarantulas, which, where she lives, are common, tasty, and often
41 served as a snack. What made them different was to have tarantulas on a
42 sandwich. She had never eaten a sandwich before.



Figure 13.4 Wearing something different: clothes to read the newspaper at the bus stop. Jude Michael.

- 1 A more complex example of a Do Something Different is the challenge to
 2 do something your significant other always does that you never do. This
 3 requires reflection and observation of one's roommate, parent, boyfriend, or
 4 pet, and selecting those traits, such as peeing standing up (boyfriend), obses-
 5 sive compulsive behavior (parent), chewing tobacco (roommate), or riding
 6 in a car with your head out the window (dog), that are interesting and repli-
 7 cable. Implementing the task on a day-long basis can be both embarrassing
 8 and surprising: One single dad copied his nine-month-old son and wore (and
 9 used) an adult diaper through the course of a day.
- 10 Perhaps the most normal and yet divergent different of this type was a guy
 11 who went to Victoria's Secret and convinced them to fit him for a bra. He
 12 measured a 36AA, and the salesperson deftly noted that Victoria's Secret
 13 didn't carry that size but provided him with a training bra. In the changing
 14 room, and with his girlfriend serving as the camera operator, they recorded



Figure 13.5 Eating something different - bagel with cream cheese, via one's feet.
Lindsay N. Smith.

1 his experience in trying it on. While he did need some instruction from his
2 girlfriend, he was clearly in “different” territory.
3 Each challenge becomes more complex and begins to be judged in the
4 context of the class and not in society as a whole. After weeks of personal
5 exercises, interacting with others becomes important to developing one’s
6 creative skills. About ten weeks into the semester, students are challenged to
7 generate a DSD for someone outside of the course to complete. Most often
8 this person is the roommate or friend who has been photographing the
9 previous DSDs. In some cases, however, others are recruited to participate.
10 As evangelists for creativity, the students strengthen their own personal crea-
11 tivity and develop an understanding of the nature of creative challenges.
12 Rather than specifically directing an activity, each student needs to *give* a
13 challenge instead. Brothers have been dramatically made up, fathers have
14 received pedicures, and mothers have snuck out at night to cover a neigh-
15 bor’s tree with toilet paper. Changing gender appearances has led to unusual
16 outfits and adjustments in restrooms.
17 I did wonder who that guy was; sometimes, near the beginning of class,
18 you don’t remember all the student faces, and the guy in the back with the
19 mustache and stocking cap looked sort of familiar. He listened intently as we
20 sat through the other students’ work and then, when Annika took off her



Figure 13.6 Something your “other” does. Annika Q. Yan.

1 disguise and describe how she had used the men’s room without incident all
2 day, it became clear....

3 Evaluation of these projects through the critiques and discussions of each
4 assignment becomes part of the learning process of the class. While there are
5 parts of the assignment that are very objective - such as requirements for
6 pre-planning, multiple initial ideas, photographic documentation, and a writ-
7 ten description - the essential aspect, originality, is a subjective evaluation.

8 While most of the course focuses on fluency, the ability to rapidly develop
9 multiple new ideas, the DSDs are evaluated subjectively on *originality*, the
10 novelty and uniqueness of creative efforts and whether the idea was creative or
11 merely different from their ordinary activities. As creativity is often evaluated
12 in comparison with society, the instructors of the course base their decisions on
13 their own experiences as guiding heuristics. If they have done something simi-
14 lar, it’s merely different, and not yet original. If they could imagine completing
15 something similar, it’s moderately creative. If they laugh or gasp at the idea,
16 indicating cognitive dissonance, it’s very original and gets the full score.

17 As the term progresses, learners are also asked to work with others as part-
18 ners, as part of a team, and eventually to convince a willing civilian to
19 attempt their own DSD. The series concludes with the construction of a
20 Rube Goldberg Machine, a contraption that completes a task in an inventive,
21 yet overly complex manner.

16 One difficulty with the defining feature of the class is the nature of
17 creative ability itself. Explaining the complexities of creativity as it
18 relates to weekly projects becomes tough when the concept is chal-
19 lenging enough to define as it is. I found that sometimes students want
20 or need extra guidance and feedback regarding the quality of ideas and
21 “if they’re doing it right.” There’s always some disorientation that’s
22 associated with the novelty factor of the class, and it tends to emphasize
23 some of this need.

24 As the value of success is rooted in the idea, students are encouraged
25 to report on the results of their work regardless of success or failure in
26 execution and planning. The point is it had a result and they can learn
27 from it. Additionally, oftentimes students become too engrossed in the
28 thought of just getting out of their comfort zone.

29 During the projects that required a reflection on habits and beliefs,
30 students frequently quickly evolved from overt “differentness” -
31 generating the most unique idea possible - to executing a more subtly
32 creative idea that offered up commentary on their daily experiences as
33 college students. Many student projects explored the ingrained biases
34 against what’s different from their own experiences. Students have
35 used these projects as a gateway to explore homelessness, either
36 through interviews or through the act of giving to strangers, with the
37 intent to provoke others to think more critically about biases.

1 The differents evolve through the semester as students gain more experience.
2 The differents change relationships with peers and social groups as well as
3 the student’s understanding of and ability for creativity. Students become
4 more capable of doing something that, just weeks earlier, would have been
5 unthinkable.

6 Evolution

7 The course began as a freshman seminar in 2000. It continued in seminar form
8 for six years, and over that time the course material developing iteratively.

9 The course subsequently developed into a large lecture course when it was
10 required by one of our departmental majors. This necessitated a number of
11 changes in course structure, including the use of a course management
12 system for collecting course assignments and grading and the use of teaching
13 assistants to lead discussion sections.

14 About half of the students in the course are from our Retail Merchandising
15 major, with the rest of the students coming from across the University.

1 Students are generally not design students, and come from areas such as
2 journalism, mechanical engineering, and business.

3 The course has recently shifted to a full online version for one of two
4 annual offerings. In alternate semesters, the course will continue to be
5 offered in an in-person format. It is unlike many other courses that move to
6 the online environment that focus on the delivery of information, develop-
7 ment of learning through discussion, and evaluation through digital quizzes.
8 It also functions like an online studio course, with substantial work away
9 from the computer, located in the daily life of the learner.

10 Project collection in both versions is done through an online course
11 management system, with each assignment requiring written documenta-
12 tion and visual recording of the activity, ranging from single images to
13 polished videos. In the discussion sections, the DSDs are presented and
14 critiqued by the instructor and teaching assistants. The best-in-section
15 examples are collected to be presented to the full class where a best-in-class
16 is selected.

17 As with many other studio courses, there is constant pressure to be more
18 productive and to reach more students, and this will shape the future of this
19 course. The first format changes, from a small seminar to a larger lecture
20 course, are understandable in any university environment. The move to an
21 online environment is a similar shift.

Projects often become a lens through which the spectrum of personal meaning is discussed, even very early on in the semester. The associations between creativity and personal significance or expression are made through assignments that ask the student to “do something different.” For example, in the case of wearing something different, students need to consider what is different for their own personal comfort zone, but also what is considered different for their culture.

This can add another level of complexity in critiquing the assignments. It’s very similar to being in a studio class and critiquing a design or a work of art in which the creator has expressed a lot of personal value. There is a challenge in being able to provide feedback on the quality and creative skill of the assignment as a whole while separating it from the personal significance to the student, and not critiquing their personal experiences or values.

This is something I find to be a unique way to observe and understand the dynamic of meaningful communication through creative experiments as a whole, which is arguably the most fundamental component of design.

Table 13.1 Percentile increases calculated from raw scores.

	Average Standardized Scores [mean=100, SD = 20]						
	F2009	F2010	S2011	F2011	S2012	F2013	S2015
pre-	101.76	115.56	107.17	110.69	111.65	110.18	112.03
percentile	53.51%	78.17%	64.00%	70.35%	71.99%	65.62%	68.46%
post-	129.35	129.67	129.25	128.01	130.05	132.03	132.8
percentile	92.89%	93.10%	92.82%	91.93%	93.35%	91.01%	91.78%
Number	50	33	36	80	41	89	46
[N]							

1 Assessment

2 Providing an outside benchmark for learning, everyone in the class is
 3 tested using the Torrance Tests of Creative Thinking. The Torrance Tests
 4 were developed in the late 1950s and are the most used standard test for
 5 evaluating creativity. The TTCT focus substantially on the aspect of diver-
 6 gent thinking. Learners are tested at the beginning of the term and at the
 7 12th week, with results provided to students to help them understand and
 8 internalize concepts of the measurement of creativity.

9 Measurements of student creativity indicate a class development from a
 10 beginning average 67th percentile to a final average at the 93rd percentile in
 11 measured creativity. Personally, the course remains interesting and one that
 12 is consistently changing and different from previous experience. The theo-
 13 retical background continues to develop and the research opportunities
 14 remain strong.

15 The Torrance Test provides an important personal connection to a
 16 research-based understanding of creativity, as well as a vocabulary to discuss
 17 concepts of creativity such as fluency (the ability to generate a number of
 18 ideas) or originality (the development of rare or unique ideas).

19 Instruction

20 This course does afford me the opportunity to work with a limited number
 21 of graduate teaching assistants in a teaching and learning environment. Their
 22 development and collaboration has been an important part of the growth of
 23 the course.

24 In a similar way to the students, teaching assistants evolve through teaching
 25 the course, from a more didactic approach to one of leading students to become
 26 more creative. In the end, the operation of the course must be a performance
 27 in and of itself; fluid, dynamic, and improvised, not choreographed.

28 Teaching assistants are also challenged by the skills nature of the course,
 29 comparing the course, consciously or unconsciously, with their own learning

1 experiences. For this course, most have been selected for their ability to
 2 interact with younger students as opposed to a specific skill in a discipline.
 3 They must deal with a topic that is more abstract and ephemeral, and less
 4 visible than, for example, graphic design or drawing. Studio courses in
 5 general are about providing questions and challenges, and not answers.
 6 Within this course, we go beyond the traditional discipline-based course and
 7 focus on a different skill.

8 **Finish**

9 One of the concepts of the course is to have learners build their learning
 10 experience in the “real world” and within their own personal experience. It
 11 is about changing their processes, their thinking, and most of all their habits,
 12 and encouraging highly skilled and motivated students to engage in this
 13 open-ended, complex learning method. In many educational experiences,
 14 most skilled students quickly seek and find the one correct answer to a prob-
 15 lem, getting to “done” as soon as possible. However, this class specifically
 16 seeks more and different answers. One central tenet is that the only wrong
 17 answer is *one* answer, a model that is strange and cognitively challenging for
 18 many, but essential to creativity.

19 Students are often surprised by this as a course and challenged by the
 20 nature of the learning. Their previous experience in education is often one
 21 of information delivery and retention and not of skills development. They do
 22 not expect a vision that includes the experiential or problem-based proce-
 23 dures of the course. Most of these students have already been highly success-
 24 ful in didactic, lecture-based, information-delivery teaching situations, and
 25 seek to continue that success through doing the same things, not by being
 26 encouraged to do something different.

27 **References**

- 28 Plucker, J. A. (1999) ‘Is the proof in the pudding? Re-analyses of Torrance’s (1958
 29 to present) longitudinal data’. *Creativity Research Journal*, 12(2), pp. 103-114
 30 Im, H., Hokanson, B. and Johnson, K. K. (2015) ‘Teaching creative thinking skills:
 31 A longitudinal study’. *Clothing and Textiles Research Journal*, 33(2), pp. 129-142
 32 Kim, K. H. (2011) ‘The creativity crisis: The decrease in creative thinking scores
 33 on the Torrance tests of creative thinking’. *Creativity Research Journal*, 23(4),
 34 pp. 285-295
 35 Vygotsky, L. S. (1978) *Mind and Society: The Development of Higher Psychological*
 36 *Processes*. Cambridge, MA: Harvard University Press