

Impact of an Imagination Exercise on Creativity for Fashion Design Students

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ABSTRACT— *Research has found that creativity and imagination are highly correlated. In practice, educators may ask themselves, “How far can the imagination push creativity?” The purpose of this study was to use an imagination activity for fashion design students to increase creativity when sketching a garment. It was hypothesized that students who received an imagination activity would produce more creative products than those who did not receive this kind of activity. Two major findings were found. First, the relationship between GPA and technical goodness and aesthetics was moderate and strong, respectively. However, the relationship between GPA and creativity was weak. Canonical correlation further confirmed this relationship. Second, students who received an imagination activity excelled their counterparts in terms of creativity, and this effect was large. For students in the field of fashion design creativity is critical. And the major findings of this study support the notion of encouraging creativity development in fashion design curricula.*

Keywords—Creativity, imagination, creativity training, fashion design, CAT

1. INTRODUCTION

Research has found that creativity and imagination are highly correlated. In practice, educators may ask themselves, “How far can the imagination push creativity?” In the creativity research community, creativity is typically defined in terms of the manifestations of activity. Two attributes of creativity are widely supported by students of creativity: usefulness and uniqueness (Amabile, 1993; Ivcevic & Mayer, 2009; Treffinger, 2004). Nickerson (1999) recognized that even though novelty or originality is treated as a criterion of creativity, it is important to be aware that those creative ideas or products are not independent of the contributions of predecessors. Namely, the connection does exist with preceding products or ideas. An alternative way of defining creativity is to consider a way of thinking. This connotation admits the possibility and potential of being more creative (Beghetto & Kaufman, 2010; Kong, 2007; McCormack, 1974).

Several theories and empirical studies have offered various perspectives that illuminate creativity development (Baer & Garrett, 2010; Davis, 2004; Hennessey, 2010; Piirto, 2010). The major findings of those studies arrived at two conclusions about creativity: (a) everyone has creativity and (b) creativity can be taught and developed. Therefore, teachers can be an imperative resource in facilitating students learning experience and unleashing their potential in the classrooms. As a result, one of the key responsibilities of teachers is to plant the creativity seed in students’ minds (Baldwin, 2010).

Karpova, Marcketti, and Barker (2011) introduced creativity training in the fashion design classrooms because they believed it could increase creative thinking. They found that students demonstrated a significant increase in creativity when they went on to do the figural format of the Torrance Tests of Creative Thinking (TTCT; Torrance, 1974). Nickerson (1999) recognized, “how to enhance creativity is not well understood, but there are possibilities that merit exploration” (p. 392).

The purpose of this study was to use an imagination activity for fashion design students to increase creativity when sketching a garment. More specifically, the imagination task served as a stimulus in this study to promote creative performance. It was hypothesized that students who received an imagination activity would produce more creative products than those who did not receive this kind of activity. It is hoped that this study will inspire other instructors in the field of fashion design to foster creativity in their students.

2. CREATIVITY AND IMAGINATION

In psychology literature, divergent thinking is closely linked to creativity (Gardner, 1993; Guilford, 1957; Torrance, 1988; Williams, 2004). Indeed, divergent thinking is viewed as one major element of the cognitive process in creativity (Guilford, 1970; Runco, 2004). Creativity is dependent on fluidity of thinking and free association, which is independent of intelligence (Fasko, 2006; Sternberg & Lubart, 1995).

Barron (1958) posited that “[creative people] have more contact than most people do with the life of the unconscious—with fantasy, reverie, the world of imagination” (p. 164). Vygotsky (1930/2004) theorized about the relationship between creativity and imagination. He denoted that the imagination serves as an imperative impetus of all human creative activity. In Vygotsky’s view, the principle that formulates the operation of the imagination is contingent on the richness and wideness of an individual’s experience because “imagination always builds using materials supplied by reality” (p. 14). Vygotsky’s (1930/2004) major contributions were to provide explanations of the development of creativity and to propose that imagination is the mechanism of creativity. However, his perspective on creativity has not received enough attention nor undergone critical analyses (Kim, 2006).

According to the creativity literature, imagination and creativity share similar constructs (Craft, 2003; Dansky & Silverman, 1973; Qualifications and Curriculum Authority, 2000). Ribot (1900) proposed that creativity and imagination are intercorrelated and declared that “creative imagination demands something new: this is a peculiar and essential sign” (p. 650). Duch (2007) believed that “creativity requires imagination and filtering” (p. 526). Similarly, Piirto (2010) identified an imperative role of imagination in creativity and stated, “imagination in the creative process refers to a mental faculty whereby one can create concepts or representations of objects not immediately present or seen” (p. 159). In addition, imagination and play are highly correlated and in turn facilitate creativity (Dansky, 1999; Root-Bernstein & Root-Bernstein, 2006; Russ, 2003). The National Advisory Committee on Creative and Cultural Education (1999) recognized the essential role of imagination in generating ideas:

Imaginative activity is the process of generating something original: providing an alternative to the expected, the conventional or the routine Imaginative activity is a form of mental play—serious play directed towards some creative purpose. It is a mode of thought which is essentially generative. (p. 31)

In the education field, the concept of imagination has served as a major approach to encourage creativity (Esquivel, 1995; Saracho, 2002; Torrance, 1962). Mirowsky and Ross (2007) pointed out that “creativity is the degree of originality, imagination, and self-expression in one’s activities” (p. 386). Torrance (1995) recognized that for educators the term “creative thinking” often refers to “divergent thinking,” “productive thinking,” or “imagination” (p. 85). Houtz and Frankel (1992) suggested that with the visualization of imagination, this imagery would help individuals unleash their potential to generate numerous ideas through the strategies of “manipulation, transformation, or comparison of ideas” (p. 184).

3. METHOD

Because of the availability of the participants, the quasi-experiment unbalanced design (Creswell, 2007) was used for this study. Convenience sampling was used and subjects were recruited from the fashion design department from a southwestern private university.

3.1 Subjects

Two classes were utilized. One was assigned as an experimental group with nine students (Introduction to Fashion Design) and another was a control group with 14 students (Computer Illustration for Fashion Design). A total of 23 college students (22 females) from the fashion department participated in this study, with a mean age of 20.11 years ($SD = 2.47$, five missing). The demographic breakdown was as follows: one Asian, three African Americans, two Caucasians, 14 Hispanics, and three from mixed backgrounds. The majority were sophomores (12 students), with a mean grade point average (GPA) of 3.40 ($SD = .50$, five missing).

3.2 Intervention

The intervention used for this study was the “Imagination Activity-Picture Completion”, which was adapted from Torrance (1974). The instructions that were given to the participants were as follows:

Add lines to the incomplete figures. In 10 minutes see how many objects or pictures you can complete. The lines should be part of whatever you make. Try to use your imagination and creativity to think of things that no one else will think of.

3.3 Measures

“The Creative Fashion Design Activity” was used to measure the participants’ creative performance. Participants were asked to use their imagination and creativity to sketch a unique garment. The instructions that were given to the

participants were as follows:

You are invited to draw a sketch on a blank white letter size paper. The topic of the drawing is “Design your own unique garment, the most fantastic dress you can think of.” Please use your “imagination and creativity” to finish this activity. You will have 10 minutes to create your unique garment for this activity. Before you start, please complete the background information as follows. Hope you enjoy this activity!

The Consensual Assessment Technique (CAT) was used to evaluate the creative fashion design activity (Amabile, 1982, 1996). Four experts rated each garment sketch for creativity. Three of those experts were faculty members from the fashion department and one expert was an art educator. All the judges worked independently of one another and with no knowledge of who had created the sketch. The CAT is based on the idea that the definition of creativity will not be provided to the judges and is solely based on the subjective knowledge of creativity in their fields. Generally, this assessment has a tendency to produce a good inter-rater reliability, ranging from .80 to .90 (Baer, 1996; Kaufman, Baer, & Cole, 2009). In addition, one of the advantages of the CAT is that its validity is not contingent on the validity of any particular creativity theory because its key tenet is requiring artifacts to be evaluated by experts in the specific domain (Amabile, 1996; Baer, 1993). This study also included another two dimensions for evaluation: technical goodness and aesthetics. The main purpose for evaluating three dimensions was to examine discriminant validity and explore possible relationships among these three dimensions. The following instructions of the grading sheet were given to the experts:

For the purpose of this study, the researcher will not provide this kind of criterion for you to judge the creativity, technical goodness, and aesthetics. Rather, it is asked that you rate the sketches solely on the basis of your thoughtful-but-subjective opinions of their creative products. You are asked to rate the creativity, technical goodness, and aesthetics for the sketch on a 5-point rating scale from 1 to 5.

The inter-rater reliability using the CAT was estimated using Cronbach’s coefficient alphas (Cronk, 2008). Kaufman, Baer, Cole, and Sexton (2008) indicated, “Coefficient alpha is a standard measure of internal consistency, and has been used in creativity research as a measure of interrater reliability (treating raters as items)” (p. 174). The reliability test of Cronbach’s Alpha for creativity was .778, for technical goodness .927, and for aesthetic value .860. These results show that the consistency among the raters was sufficient only throughout these three dimensions (Kaufman et al., 2008).

3.4 Procedure

An informed consent form was distributed to all the participants in order to explain the purpose of the study. Students from the experimental group had a 10-minute imagination activity and then a 10-minute creative fashion design task. During the imagination session, the participants were told, “Use your imagination and creativity to come up with ideas.” Immediately following the imagination session, the same individual who had administered the previous activity gave each student a creative fashion design task.

Students from the control group were not given a 10-minute imagination activity. They were only given a creative fashion design task. The instructor also encouraged them to use their imagination and creativity to design their own unique garment. This session lasted 10 minutes.

4. RESULTS

A Pearson correlation coefficient was calculated for the relationship between the participants’ age, GPA, creativity, technical goodness, and aesthetics. As Table 1 shows, there were no significant relationships among age and other variables. Interestingly, a strong positive correlation was found between GPA and aesthetics, $r = .587, p < .05$. A strong positive correlation between creativity and technical goodness was found, $r = .527, p < .01$ and a moderate positive correlation between creativity and aesthetics was also found, $r = .446, p < .05$. Finally, among those bivariate correlations, the relationship between technical goodness and aesthetics was the strongest and the most significant, $r = .770, p < .01$.

Table 1: Means, standard deviations, and intercorrelations on age, GPA, creativity, technical goodness, and aesthetic(n = 23)

Variables	M	SD	1	2	3	4	5
1. Age	20.11	2.471	--				
2. GPA	3.398	.497	.329	--			
3. Creativity	2.88	.866	.088	.198	--		
4. Technical goodness	2.347	.962	-.104	.421	.527**	--	
5. Aesthetics	2.402	.962	-.103	.587*	.446*	.770**	--

* $p < .05$.

** $p < .01$.

In order to further analyze the relationships among the four variables (GPA, creativity, technical goodness, and aesthetics), a canonical correlation analysis was performed. Grade point average and technical goodness were grouped as the first set of variables, and creativity and aesthetics were grouped as the second set of variables. With the two canonical correlations included, $F(4, 28) = 8.71, p < .001$. With the first canonical correlations removed, F values were not significant, $F(1, 15) = .47, p = .502$. Therefore, there was only a significant relationship in the first pair of canonical variates.

The first canonical correlation was .89, representing 79% overlapping variance for the first pair of canonical variates. This represents a substantial relationship between pairs of canonical variates. Loading matrices between canonical variates and original variables is shown in Table 2. Correlations between variables and variates (loadings) in excess of .3 were interpreted (Tabachnick & Fidell, 2007). The first pair of canonical variates indicates that students with a higher GPA (.64) and technical goodness (.97) are associated with having more creativity (.54) and more aesthetics (.98).

Table 2: Correlations and standardized canonical coefficients between two sets of variables and their canonical variates

Variable	First variate	
	Correlation	Canonical coefficient
First set		
GPA	.64	.29
Technical goodness	.97	.84
Second set		
Creativity	.54	.18
Aesthetic	.98	.91

In evaluating the group differences for creativity, technical goodness, and aesthetics, an independent-samples t test was calculated comparing the mean scores of the two groups. Table 3 shows no significant difference between the two groups in terms of technical goodness and aesthetics. However, creativity attained a marginally significant difference, $t(21) = -2.02, p = .057$. The mean of the experiment group was higher ($M = 3.31, SD = .92$) than the mean of the control group ($M = 2.61, SD = .74$). Large effects size was also found (Cohen's $d = .86$).

Table 3: Group difference for creativity, technical goodness, and aesthetic (n = 23)

Variables	Control(n =14)		Experiment(n =9)		$t(21)$	p	Cohen's d	95%CI
	M	SD	M	SD				
Creativity	2.61	.74	3.31	.92	-2.02	.057	.86	[-1.42, 0.22]
Technical goodness	2.34	.81	2.36	1.21	-.05	.959	.02	[-0.90, 0.85]
Aesthetic	2.32	.74	2.53	.92	-.49	.627	.26	[-1.08, 0.66]

5. DISCUSSION

Before discussing of the major findings of this study, several limitations should be considered. First, because of available samples, this experimental study did not use randomized samplings. The sample size was also small. It is expected that recruiting more subjects would increase the power of the study. Second, this study utilized the imagination activity as a stimulus to increase creativity. There are other types of strategies, such as intuition, creative problem solving, and play, that could have also been used to increase creativity (Mansfield, Busse, & Krepelka, 1978). In other words, if the participants had experienced different activities, the results may have been different. Finally, this experiment was a one-shot study and in order to understand the whole picture of the effects of interventions, it would be better to conduct a longitudinal study.

In the investigation of relationships among age, GPA, creativity, technical goodness, and aesthetics, several significant correlations were found. It is interesting to notice that the relationship between GPA and technical goodness and aesthetics was moderate and strong, respectively. However, the relationship between GPA and creativity was weak. Canonical correlation further confirmed this relationship (canonical coefficient between creativity and GPA was .18).

This result is also consistent with other studies (Houtz & Frankel, 1992; Mednick & Andrews, 1967). According to the literature, it suggests that creativity and intelligence are different constructs (Amabile, 1996; Simonton, 1999). Thus, the finding from this study is in line with the literature.

In terms of the effects of an imagination activity on the increment of creativity, the results show that there was a marginally significant difference between the control group and the experimental group. Most important, this effect was large. To some extent these results demonstrate how an imagination intervention can temporarily increase an individuals' creativity performance. It is probable that this kind of imagination activity serves as a warm-up activity, which in turn loosens a student's fixed-mind and increases the remote association of ideas.

In this research, the CAT was used to evaluate creativity. The use of the CAT shows some value in examining creative performance in fashion design students. However, the reliability test assessing creativity was acceptable but not good enough. According to Baer and McKool's (2009) report, the reliability of the CAT is over .80. It is possible that in this study the reliability test was not good enough because only four judges from two different fields (art education and fashion design) were recruited. Baer (1993) suggested that when using the CAT, over five raters is probably a better choice. Kaufman, Lee, Baer, and Lee (2007) acknowledged that one drawback of the CAT is that assembling panels of experts is time-consuming and even expensive. There is a tradeoff with using the CAT.

For students in the field of fashion design creativity is critical. And the major findings of this study support the notion of encouraging creativity development in fashion design curricula. In fact, Karpova et al. (2011) attempted to include several creativity activities in an introductory level course of fashion design. They underscored the importance of creative thinking in fashion design students and argued that "in the ever-changing world of the fashion industry, creative skills are imperative" (p. 53). Additionally, future research could investigate the longitudinal effects of this training. It can be argued that students may need more time and practice more creative thinking strategies to maximize their levels of creativity. At this point, we could conclude that more research and practice are still needed in this field.

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