

Assessing Creative Potential: Individuals vs. Groups

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Abstract

Creativity has been declared essential for organizational survival in the 21st century economy. Accordingly, assessing and developing creative talent has been declared a priority of both organizations and governments around the globe. As a result, over the past two decades creativity has become a widely researched topic in both the academic and business environments. The purpose of this study is to assess creative potential of students majoring in business compared to students majoring in art to determine if there are any differences in that potential and if there is an interaction effect when they work collaboratively. The first part of our study was designed to assess individual creativity. We surveyed undergraduates of a small U.S. college on four creativity-relevant measures – tolerance of ambiguity, self monitoring, learning style, and tolerance of risk– and received 55 responses. The survey results of the four measures indicated that business and art majors have equal creative potential. The second part of our study included an experimental design intended to assess creativity under five conditions: art majors working independently; business majors working independently; business majors in a group; art majors in a group; and a group comprised of students from both majors. The results demonstrated that when working in cross-discipline teams, creative output increased over the other four conditions. There are implications for both higher education and organizations from these results.

Introduction

In today's rapidly changing environment, a growing number of companies recognize the need for creative talent to develop original solutions to an increasing number of problems. Leveraging that talent has become an organizational priority with implications for society, as organizations bring creativity to society through the creation of products and services, satisfying customer needs, creating jobs, and contributing to the economy. As organizations use ideas in creative ways increasing the quality of life, this resulting organizational creativity serves the world around us in an extremely valuable way. The purpose of this study is to contribute to our understanding of this topic by demonstrating the untapped creative potential that exists in individuals, and to suggest ways to increase that potential through cross-discipline or cross-functional collaboration.

Theoretical Background on Creativity

Over the past few decades, creativity has become a widely researched topic in both the academic and business environments. The increased investment in understanding creativity has resulted in a profusion of research on fostering creativity at the individual, group and organization level (Driver, 2001). Additionally, where, and how, creativity occurs continues to interest researchers. As corporations focus on developing creative talent at the individual, group, and organizational levels, colleges and universities must consider if they are developing the creative ability of their students to prepare them for the 21st century business environment they will be entering.

The study of creativity has generated numerous definitions with vastly different implications reflected in the diversity of values regarding creative talent (Oldham, & Cummings, 1996). While some definitions define creativity as a characteristic of a person, other definitions imply creativity is a developmental process (Amabile, 1988). However, most definitions of creativity concur in that something "new" is at the core of creativity (Seidel, Rosemann, & Becker, 2008). May (1959), for example, defined creativity as "the process of bringing something new into birth" (pg. 91). Later definitions suggest that creativity is purposeful or useful (Seidel, Rosemann, & Becker, 2008). For the purpose of this study, creativity will be defined as, "a purposeful activity (or set of activities) that produces valuable products, services, processes, or ideas that are better or new" (DeGraff and Lawrence, 2002).

While most early research examined creativity at the individual level, individual creativity contributes to creativity in groups. Understanding these interactions is important, particularly as teams are increasingly used in both the academic and work environments to foster creativity (Mohrman, Cohen, & Mohrman, 1995). Additionally, the organizational context and environment effects both individual and group creative process and outcome. In reciprocal fashion, individual creative behavior is mediated through group creative processes to influence organizational creativity (Farr, 1990). Organizations endeavor to foster creativity in a variety of ways including restructuring the work environment, selecting individuals based on personality assessment, and investing in intense behavioral training. Yet, many of these strategies often prove unsuccessful (Barron & Harrington, 1981; Farr, 1990).

Research on creative assessment is flanked with fundamental concerns, such as, validity, reliability, and usability (Treffinger, 2003). Despite the importance of creativity, the challenge of assessing creativity has made the research particularly complex. Yet, despite the challenges, creativity identification and assessment research has received substantial interest among researchers, particularly in education and psychology (Treffinger 1987). Researchers are in agreement that the purpose of creativity assessment should extend beyond the effort to label or isolate highly creative people from their less creative peers. There is a call for more multilevel analysis in examining creativity. The current study addresses this call by examining creativity at both the individual and group level.

Individual creativity is a function of antecedent conditions, cognitive styles and abilities, personality, motivational factors, and knowledge (Woodman, Sawyer, & Griffin, 1993). Numerous studies have attempted to identify the specific characteristics of individuals that predict creative accomplishment (Barron, & Harrington, 1981; Oldham; & Cummings, 1996).

For example, Amabile's (1983, 1996) *Compositional Theory of Individual Creativity* predicts that task-motivation, domain-relevant skills, and creativity-relevant processes are important components for individual creativity (Taggar, 2002).

Task motivation is a stable trait (Amabile, Hill, Hennessey, & Tighe, 1994) demonstrated by a "general and pervasive orientation toward one's work" (Amabile, 1996, p. 116). Task motivation can be indicated by behaviors related to the amount and persistence of effort. Amabile (1994) found that intrinsically motivated people showed greater commitment and devoted more time to task completion. The domain relevant skills component of creativity represents the ability to learn certain types of domain-specific knowledge (Amabile, 1996). Domain skills require familiarity with the topic in question, and may be indicated by the individual's depth and breadth of knowledge related to the topic or problem at hand (Amabile, 1996). Creativity relevant skills "determine the flexibility with which cognitive pathways are explored, the attention given to particular aspects of the task, and the extent to which a particular path way is followed in pursuit of a solution" (Amabile, 1996, p. 95).

Behavioral indicators of creativity relevant processes include goal setting and response to challenge, as well as active participation in group problem solving activities (Taggar, 2002). Empirical evidence suggests that individuals are more creative when they possess higher levels of task motivation, domain relevant skills, and creativity relevant skills (Taggar, 2002; Conti, Coon and Amabile, 1996). Similarly, the "five factor model" of traits suggests that a stable set of core characteristics continue to emerge as correlates of creative achievement, such as conscientiousness, openness to experience, agreeableness, extraversion, and emotional stability. The "five factor model" allows consistency among research, calls attention to personality characteristics related to job performance, and provides a higher predictive validity than cognitive ability tests (Taggar, 2002; Hogan, 1991). It is important to examine how these personality traits relate to group creativity.

In examining group creativity, the research focus is on determining the conditions for creative outcomes that result in creativity beyond an aggregate of each individual group members' creativity (Woodman, Sawyer, & Griffin, 1993). It has been determined that solution originality, quality, and success are dependent on the group member's ability to view problems differently, redefine problems, extend information searches, and produce high quality ideas (Taggar, 2002). Furthermore, group creative performance is improved by effective task-allocation, task variety, coordination of diverse efforts, and careful planning (Taggar, 2002; Brophy, 1998). Group problem solving skills, such as brainstorming, were developed with the belief that ideas generated in a group environment would allow members to build off of others' ideas and would result in a greater number of ideas being generated (Woodman, Sawyer, & Griffin, 1993). Thus, groups invite members to not simply add to his/her own knowledge, but use others' knowledge to stimulate the usefulness of his/her own skills.

It is suggested that the probability of creative outcome in group work may be highest when leadership is democratic and collaborative, structure is organize rather than mechanistic, and when groups are composed of individuals drawn from diverse fields or functional backgrounds (Woodman, Sawyer, & Griffin, 1993). The resulting environment allows groups to leverage their different backgrounds allowing the integration of multiple perspectives.

Hypotheses

In an attempt to better understand creativity, this study will examine the creativity of students majoring in business as compared to students majoring in art using a survey assessing four individual creativity-relevant measures, and an experimental design used to assess creativity in groups.

The first survey measure focused on the student's tolerance of ambiguity. According to Budner (1962), ambiguity arises from three main sources: novelty, complexity and insolubility. Novelty indicates the extent to which an individual is intolerant of new, unfamiliar information or situations (Budner, 1962). The complexity score indicates the extent to which an individual is intolerant of multiple, distinctive or unrelated information (Budner, 1962). Insolubility indicates the extent to which an individual is intolerant of problems that are very difficult to solve. For example, when alternative solutions are not evident, information is not available, or the problem components seem unrelated (Budner, 1962). Due to the existence of ambiguity, society must cope with its effect on individuals. Intolerance for ambiguity suggests that an individual tends to perceive situations as threatening rather than promising (Wheeler, and Davis, 1979). People differ in the extent to which they can cope with ambiguous, incomplete, unstructured, and dynamic situations. Individuals who have a high tolerance for ambiguity tend to pay attention to more information, interpret more cues, and possess more sense making categories than people with low tolerance for ambiguity (Wheeler, and Davis, 1979). They also cope more effectively with major organizational change, downsizing, stress, and conflict (Armstrong-Stassen, 1998).

Hypothesis 1: Business majors are more likely to possess a lower tolerance of ambiguity than Art majors.

The second survey measure focuses on self-monitoring. Self-monitoring refers to a person's ability to adjust his or her behavior to external situational factors (Greenberg & Baron, 1990). People who are high in self-monitoring look for cues in the situation to tell them how to behave, whereas those who are low in self-monitoring use their own values and motives to guide their behavior (Michener, Delamater, Schwartz, 1986, pp. 334). High self-monitoring individuals show considerable adaptability in their behavior. They are extremely sensitive to external cues and can behave differently in different situations. They are capable of presenting striking contradictions between the public persona and the private self. By contrast, low self-monitors can't disguise themselves this way; they tend to display their true dispositions and attitudes in every situation; hence, there is high behavioral consistency between who they are privately and what they do publicly. High self-monitors are particularly sensitive to other people and alter their responses to others' cues. They are different with different people and in different situations, compared to low self-monitors who seem less aware of or concerned with their impact on others. Low self-monitors' actions usually reflect their inner feelings and attitudes and they are less likely to change or adjust in each new context. For example, high self-monitors can be expected to demonstrate greater flexibility in adapting their leadership style to changing situations, using a variety of conflict-resolution techniques.

Hypothesis 2: Business majors are more likely to be high self-monitors than Art majors.

The third survey measure used to assess individual creativity was Kolb's learning style theory. Kolb's learning style theory (Kolb, 1984) sets out four distinct learning styles based on a four-stage learning cycle (See Diagram 1). A learning style interprets how a student learns (Hunt, 1979), and learning styles are related to patterns of individual thoughts, beliefs, attitudes, and behaviors (Gagne, 1977). Kolb's model offers a way to understand different learning styles and develops the cycle of experiential learning that applies to all. Kolb includes this 'cycle of learning' as a central principle of his experiential learning theory. It is typically expressed as four-stage cycle of learning, in which immediate or concrete experiences provide a basis for observations and reflections (Kolb, 1984). These observations and reflections are assimilated and distilled into abstract concepts producing new implications for action, which can be actively tested in turn creating new experiences (Kolb, 1995). These reflections are then assimilated (absorbed and translated) into abstract concepts with implications for action, which the person can actively test and experiment with, which in turn enable the creation of new experiences (Kolb, 1995).

The diverging learning style has a dominant score on the concrete experience and reflective observation dimensions. People with this learning style are best at viewing concrete situations from many different points of view. Research shows that these people tend to be imaginative and emotional, tend toward specializing in the arts, and prefer working in groups (Kolb, Boyatzis, and Mainemelis, 2000). The assimilating style has dominant scores on the reflective observation and the abstract conceptualization dimensions. People with this learning style are best at processing a wide range of information and placing that information into concise, cohesive, logical form (Whitten and Cameron, 2002). Research has shown that assimilators are inclined toward information and science careers; they prefer lectures, readings, analytical models, and thinking time as their learning activities (Kolb, Boyatzis, and Mainemelis, 2000). The converging style has dominant scores on the abstract conceptualization and active experimentation dimensions. People with this learning style are best at finding practical uses for theories and ideas (Whitten and Cameron, 2002). These individuals are inclined towards careers in technology and engineering (Kolb, Boyatzis, and Mainemelis, 2000). The accommodating style has dominant scores on the active experimentation and concrete experience dimensions. Research has found accommodators are inclined towards careers in marketing or sales, they prefer to work with others, establish goals, and engage in field projects (Kolb, Boyatzis, and Mainemelis, 2000).

Hypothesis 3: Business majors are more likely to possess diverging and assimilating learning styles, while Art majors are more likely to possess converging and accommodating learning styles.

The fourth and final survey measure of individual creativity focuses on risk tolerance. The willingness to take risks is a personality trait that has grown in importance in the creative era (Dubrin, 2005). Many people work for employers, start businesses, and purchase stocks with uncertain futures. The search for thrills motivates these individuals. While a strong craving for risk can be highly beneficial for organizations, there are potentially negative consequences as well (Dubrin, 2005). According to Farley (1986), type T personalities (t for thrills), refers to individuals who enjoy risk taking, thrill seeking, excitement, and arousal. When people take

risks, it is often for the excitement and thrill (Lipsitt & Mitnick, 1991). The positive side of type t personality is the creative side. People who are willing to take risk expose themselves to the possibilities of creative work (Lipsitt & Mitnick, 1991). Creativity occurs when an individual goes beyond the known, the rules, and the given (Farley, 1986); therefore, it is not surprising that risk-takers have reportedly been more creative than non-risk takers.

Hypothesis 4: Business majors are less likely to be open to risk than Art majors.

Finally, an experimental design was used to compare creativity of individuals with that of groups using Guilford's Alternative Uses Test. As suggested by Guilford (1950), creative talent or creative ability can be assessed by a number of variables, such as ideational fluency (i.e. number of ideas), the degree of novelty (or uniqueness/originality) of ideas, or the flexibility of the mind (i.e. the ability to produce different types of ideas, as opposed to rigidity). Influenced by Guilford's suggestions many creativity measures have been developed, among the most influential are the Torrance Tests of Creative Thinking, Mednick's Remote Associates Test, or Guilford's divergent production test (Torrance, 1966; Mednick, 1962; Guilford, 1967). An alternative uses test is considered to be a pure measure of creativity. It simply asks people to list as many uses as they can think of for common objects. While some people think of two or three obvious uses, other can keep adding to the list until they are told to stop. A brick is frequently used as the "common object" in Guildford's alternative uses test and was used for our purposes. In addition, our experimental design examined five conditions.

Hypothesis 5a: Business majors will have less fluency and flexibility when working individually than when working in groups.

Hypothesis 5b: Art majors will have less fluency and flexibility when working individually than when working in groups.

Hypothesis 5c: Teams of business majors will have less fluency and flexibility when working together then teams composed of both majors.

Hypothesis 5d: Teams of art majors will have less fluency and flexibility when working together then teams composed of both majors.

Hypothesis 5b: Teams composed of both business and art majors will have more fluency and flexibility when working together then teams composed of all business or all art majors.

Methods

The participants in the survey are 55 undergraduate students attending a small U.S. college. Of the 55 participants, 20 students were majoring in business while 27 students were majoring in art. Six students responded without indicating their field of concentration. Thirty-two of the participants were female, while 21 were male. The students completed an online survey to test four dimensions of individual creativity: tolerance of ambiguity, self monitoring, learning style, and tolerance for risk. The survey also collected basic demographic information, such as gender, age, and major.

To test tolerance of ambiguity, we used David Wilkinson's Tolerance of Ambiguity scale. The scale asks the subject to respond to the sixteen personal and work situations with ambiguity. The subject is asked to rate each situation on a scale of 1 to 7, indicating the extent to which he/she agrees with them. The self-monitoring scale was used to measure one's ability to regulate his/her expressiveness to fit the requirements of the situation. The scale asks participants to respond to 19 statements by simply stating whether or not he/she agrees that the statement is true, or believes the statement is false. Kolb's learning style inventory was used to measure individual learning preferences in relation to the constructs that define the Experimental Learning Model. Kolb's Learning Style Inventory (1976) asks participants to complete 12 sentences that describe learning. Each sentence has four endings. In order to complete each sentence, the participant is asked to consider recent learning situations and then rank the endings of each sentence based on how well they think the ending describes the way they learn. The participant places a "4" next to the sentence ending that describes the way he or she learns best, and a "1" next to the ending that describes the way he or she learns least. The risk taking scale used reflects the range of risk that each individual is comfortable with, not simply whether the individual likes taking risks or not. The scale asks participants to respond to 20 statements by simply stating whether or not he/she agrees that the statement is true, or believes the statement is false.

The participants in the creativity experiment were 24 business and art majors. Each student completed Guilford's Alternative Uses Test (1967) individually and in groups. After the individual test, the students completed the test in groups composed of similar majors, and finally in groups composed of both art and business majors. In the alternative uses test, each participant is required to name as many original uses of a conventional, everyday object in 10 minutes, in our case a brick. The two raters then evaluated the list to assess the originality, fluency, flexibility, and elaboration of the ideas generated. For the second part of the experiment, students were placed in groups and given and charged with collaboratively creating possible uses for a brick.

Results

The Tolerance of Ambiguity scale used to assess the extent to which individuals cope with incomplete, unstructured, and dynamic situation, showed only minute differences in the personalities of Studio Art and Business Management majors. Therefore, hypothesis one was not supported by the data. However, unexpectedly, the survey results showed large distinctions between male and female tolerance of ambiguous situations. For example, 50% of participants strongly agreed with the statement, "Often, the most interesting stimulating people are those who don't mind being different and original." Of those respondents, 11 were art majors and 11 were business majors. More interestingly, 17 were female, while only 8 were male.

The Self-Monitoring Scale had minor differences between majors, and therefore the second hypothesis was not supported. However, consistent with the results from the analysis of the Tolerance of Ambiguity data, there were significant differences between genders. In response to the statement, "I am not particularly good at making people like me," 83% of the survey participants disagreed and chose false. Of the 83%, 20 students were business majors while 24

were art majors. The more significant difference was in gender, with 27 female respondents versus 17 male respondents.

The results of the learning style inventory were consistent across both majors as survey participants suggested they learned best by doing. As a result, hypothesis 3 was not supported. Interestingly, the five statements that students most identified with were, "When I learn I like to be doing things," "When I learn I like to see results from my work," "I learn by doing," "I learn best from a chance to practice and try out," "When I learn I like to see results from my work," and "I learn best when I can try things out for myself." In response to the statement, "I learn by doing," which 64% agreed is the way he/she learns best, 17 respondents were art majors and 16 respondents were business majors. However, just as seen in the other scales, 21 of the respondents were female while only 12 were male.

Analysis of the results of the scale used to measure tolerance for risk suggested that, as a whole, the art majors were moderate-risk takers. Consequently, hypothesis 4 was not supported because art majors are not higher risk takers than business majors. Over 90% of the survey respondents replied false to the statement, "I'd rather not travel abroad," and more than 94% said "true" to the statement, "Making my own decisions is very important to me." Of the art majors participating in the survey: one student is a low risk taker, seven are cautious, 12 are moderate-risk takers, and eight are high-risk takers. Of the business majors participating in the survey, seven were cautious, 15 were moderate-risk takers, and only three were high-risk takers.

The results of Guilford's Alternative Uses Test (1967), which was used to test the fluency and flexibility of individual business and art majors, supported hypothesis 5a. On average, when working individually, both art and business majors provided 13.4 possible uses for a brick. Supporting hypothesis 5b, the participants provided an average of 24 possible uses for a brick when working in groups.

Discussion

As Toynbee (1964) stated, "to give a fair chance to potential creativity is a matter of life and death for any society." As suggested by the survey results, business and art majors have equal creative potential. The experimental design further suggests that that potential is best leveraged when both majors work collaboratively in teams, as it was shown that their creative potential increases. Colleges and universities can increase the creative potential of their students by fostering an environment that encourages collaboration across disciplines. By extension, these results imply, that to achieve creativity in business, cross-functional teams provide an opportunity for increased creativity by leveraging the different knowledge, skills and abilities of team members.

In conclusion, colleges and businesses must continue to support and promote the creativity of their students and workers respectively across all disciplines and functional areas in order to prepare them for success in the 21st century economy.

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