Fostering Individual and Organizational Creativity in Design

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ABSTRACT

Demand for creativity has moved from individual to organizational levels encompassing work environments in which organizations, competing for customers and clients, must demonstrate increased creativity and innovation as the pace of change escalates. Creativity, as a means to produce innovative outcomes, invites individuals and organizations to generate and embrace new ideas and ways of accomplishing work tasks. Facilitators of individual and organizational creativity, in non-design organizations, have revealed climate factors consistent in measuring workplace creativity; however, research findings have suggested differences between creative and non-creative environments regarding the importance of resources, time pressure, and autonomy relative to work tasks in studies of architectural and advertising work environments. This paper focuses on findings of two empirical studies used to identify key factors influencing creativity at the individual and organizational levels.

Keywords: Individual Creativity, Organizational Creativity, Design Education and Design Practice.

INTRODUCTION

Design practitioners identified by their firms as creative, often occupy positions of great influence within their workplaces. Students perceived to be highly creative are also sought after by prestigious design firms. Creative traits, then, become ever more important for design graduates to remain competitive with peers and more experienced practitioners. However, substantial disagreement remains on how designers produce designs and how their process can enhance a design product. At the organizational level, organizational creativity is not just an assemblage of creative individuals but a product of complex environmental factors. Both levels of analysis in the context of environments in which the design process serves as the method of delivery offer insights to practitioners, if findings can be transformed in such a way as to be applicable to practice settings.

The process of design is not transparent regarding how designers make decisions, what steps are taken, in what order, and even by what terms are used to define these steps. Comparisons of actions, sequence of patterns, and decision-making characteristics reveal common paths and pedagogical factors to assist educators in better understanding processes undertaken by their students in solving design problems. Research on the design process can aid practitioners in focusing efforts to attain the talent, skills, and cognitive thinking processes needed to promote high caliber positions in the design profession and to produce novel solutions to meet the challenges of the global economy. The purpose of this paper is to investigate the factors that foster individual and organizational creativity.

Literature Review

Creativity remains an elusive and intangible contributor to workplace performance and change despite emphases from psycho-economic perspectives [9, 27, 33]; agreement on the definition of the construct remains unresolved. Although creativity serves as the mantra for organizations competing in the global economy, Florida and Goodnight [16] pointed out that "…businesses have been unable to pull these notions of creativity together into a coherent management framework" despite their assertion that "a company's most important asset isn't raw materials, transportation systems, or political influence…it's creative capital - an arsenal of creative thinkers whose ideas can be turned into valuable products and services" (p. 125).

Basadur and Gelade [6] noted that organizations need to improve performance to capitalize on rapid change and establish or regain a competitive edge (p. 45). Factors affecting creativity in the workplace have been studied in other professional domains suggesting that encouragement, autonomy and freedom, and resources promote creativity in the workplace. Threats or impediments to creativity (workload pressure, work not perceived to be challenging, and organizational impediments such as rigid or controlling management structures) have been suggested as negating the role and presence of creativity [3].

Creativity inherently promotes the crossing of discipline boundaries and the study of interrelated influences [17]. However, the search for construct definition beyond the boundaries of the creative disciplines has offered little reference to creativity at the organizational level. Although Amabile, Conti, Coon, Lazenby, and Herron's [3] definition of creativity has been widely accepted as "the production of novel and useful ideas in any domain" (p. 1115), Cowdroy and de Graaff [10] defined what is 'understood by the idea of 'creativity', rather than what is meant by the word 'creativity,' providing a mindful view of different venues encompassed in creativity research. "The idea of creativity embraces a multiplicity of notions, including imagined (conceptual) ideas, development of schemata (constructs, analogies, diagrams, etc.) emanating from the ideas, physical execution of ideas (the activity of making,

performing, etc.), and created products resulting from the ideas (e.g., works of art, manuscripts, performances)" (p. 508).

Creativity has been described in terms of people, product, environment, and process [25] and used interchangeably with innovation in media and research efforts. Differentiating between the two constructs is important in talking about the influence of creativity on performance and in understanding organizational creativity. Creativity has been treated as a characteristic of individuals whereas innovation has generally been attributed to groups, teams, and organizations, and related outcomes or products. Van de Ven and Angle [as quoted in 23] defined innovation as "a process of developing and implementing a new idea" (p. 12). Amabile et al. [3] linked both constructs by defining innovation "as the successful implementation of creative ideas within an organization" (p. 1155). Within the context of this paper, creativity is defined as the ability to approach the situation with a fresh perspective, linking together previously unrelated or uncombined concepts to generate new and unexpected ideas that solve a problem or capture an opportunity.

EXAMINING INDIVIDUAL CREATIVITY

In a study of senior interior design students undertaking a two week design problem focusing on the design and development of a solution for a sustainably constructed and transported chair, the researchers were interested in understanding what factors differed through the problem identification and solving phases of the design process. Of 36 students enrolled in the course, 20 students both signed a letter of consent and completed each of four journaling prompts within the required 24 hours provided for each prompt. Only participants who submitted within the 24 hour time frame for all four interventions were included in the study ($N = 20$). Timing of responses was important as participants who submitted their responses later had more time to reflect upon their entries or were possibly in later stages of the process; either scenario could potentially skew findings.

Amabile's [1] Componential Model of Individual Creativity (Figure 1) served as the theoretical framework, using measures to elicit responses in three areas: domain relevant experience, creativity relevant skills, and motivation. Domain relevant skills in design encompassed technical skills learned in their academic preparation, special talents such as REVIT training or software integration, application of cognitive abilities, perceptual and motor skills, and knowledge of design (e.g., history, process, programming, space planning, and detailing). Creativity relevant skills considered one's cognitive style (or the mental processes used to acquire, analyze, categorize, store, and retrieve information in making decisions and solving problems), knowledge of heuristics or experience-based techniques for problem-solving, learning and discovery, and work style in terms of the ability to concentrate and knowing when to abandon unproductive ideas. Motivation identifies the individual's baseline attitudes toward a problem and their perception or rationale for undertaking the task as either intrinsic or extrinsic.
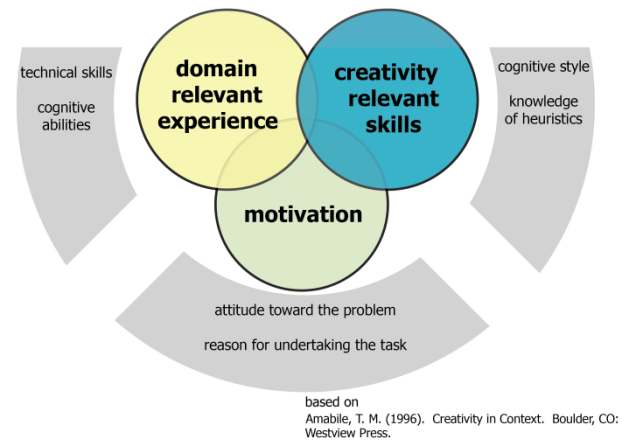

Figure 1. Componential Model of Individual Creativity [adapted from 1]

Methodology

Data were collected from student records, journaling responses to pre-determined prompts (questions), and an external evaluation of the project outcomes - a poster illustrating the problem solving process and a scale model of the chair design. Student records identified grade point average going into the last semester of their studies, age, residency (in-state/out of state), transfer credits, and total credit hours. Journal entries were examined using a deductive process to ascertain process steps and sequence of activities taken by students during the design assignment. Keywords derived from the responses were determined to ascertain participants' task involvement associated with discrete stages in the proposed model. The researchers tested the model by examining tasks outlined by each participant during time sensitive entries. Tasks including research and criteria review were considered *Analysis*. Tasks such as sketching and designing were grouped in the *Generative* stage. Testing included tasks such as experimentation or prototyping and descriptions including reviewing or reflecting were grouped in the *Reflection* stage. The construct of motivation used keywords from response prompts eliciting level of "interest in the task," and level of "excitement to continue" with the project.

External evaluators examined outcomes for high and low creativity determined by visual composition, quality and depth of design solution, and clarity of solution. They were asked to assess product outcomes for participants relative to degree of novelty and appropriateness for the project assignment. Products were rated on a 5-point Likert scale resulting in 10 possible points per evaluator or 20 points total. All products were situated along a spectrum of creativity based upon their final scores. Six individuals had scores of 15 or higher (the highest number of points awarded was 18) and five individuals had scores of 11 or lower (the lowest number of points awarded was 9). The group of participants with scores of 15 or higher was designated as the high creativity group and participants with scores of 11 or lower comprised the low creativity group. A comparison of factors cross-referencing information from student records and the external ratings revealed differences between the two groups of students (Table 1).

Table 1. Group Comparison on Creativity, Age, GPA, and Credits

Cohort	Age	GPA	Transfer credits (*M*)	Total credits (*M*)
High creative (*n* = 6)	23.6	3.83	46.0	152.0
Low creative (*n* = 5)	23.0	3.29	21.2	127.4

Findings

Study findings suggest specific differences between high and low creative outputs. For example, both groups conducted online research, but the high performers explored with greater depth and broader discovery. These students carried out more elaborate and deeper research inquiries; they talked about their ideas with peers and in general focused their research on the problem to be solved. Journal entries referenced the utilization of domain and creativity relevant skills. Student motivation remained high throughout the two week exercise, influencing reflection and redirection activities.

High creative performers brought greater background knowledge and higher motivation levels to the assignment; they also utilized multiple research venues and employed a greater variety of problem solving techniques. Prior experience was used to inform their solutions and these students brought seemingly disparate ideas and elements together during the process of developing their solutions. Most notably, their project outcomes were richer in detail and depth, reflecting greater creativity and innovation, and more complete thought and execution. An example of a creative project outcome is shown in Figure 2.

Figure 2. Example of a Creative Project Outcome

As an exploratory study this research examined the creative process and tasks resulting in higher levels of creative output. Findings from the study indicated similarities in process steps utilized by all students; however, discrete differences arose when comparing the depth of task involvement of students in the high creativity group with those in the low creativity group. Design instructors can utilize the findings from this study in how best to enhance abstract thought, divergent thinking, motivation levels, and depth in thought and action. These enhancements can aid students in designing increasingly creative product outcomes. Based on the findings, a Creativity Rating Scale (CRS) is being developed to rate individual levels of activity forming an index of creativity. The measures will address the three components of Amabile's [3] model in an additive approach with results yielding a score relative to current potential for creative output. As a tool for practitioners, the CRS may help individuals working in creative organizations to pinpoint areas contributing to heightened creativity and influence the individual's thinking about their approaches to creative problem solving.

ORGANIZATIONAL CREATIVITY

Despite a majority of research attributing creativity to individualized efforts, a focus on creativity at the organizational level has appeared in the literature. Williams and Yang [31] defined organizational creativity as an adaptive entity "highlight[ing] the need for …[greater] employee autonomy, intrinsic motivation and commitment" (p. 389), not just individual creativity in a group work setting. In a study of creativity within complex social settings, group creativity was identified as a function of an individual's group, influenced by group composition (diversity), group characteristics (cohesiveness and size), group processes (problem-solving strategies and social information processing), and contextual influences stemming from the organization [32]. Majaro [21] defined the creative organization as encompassing factors concerning the removal of barriers demonstrating managed innovation, idea evaluation procedures, motivational stimuli, communication procedures, development of idea sources, and evidence of the creative planning process.

The research literature has richly addressed factors comprising creative environments in studies of organizational climate [2, 3, 4, 11, 13, 19, 20, 24, 28], but few empirical research efforts have been conducted to further an understanding of creativity's influence on organizational performance in a manner that can be applied in practice [7, 15, 21]. Further, limiting research to climate variables denies the relationship of climate to culture, or organizational context [12], ignoring the role of values affecting actions and behavior by individuals at the organizational level [8, 22].

Methodology

By examining responses of participants from five firms (*N* = 90) from the Los Angeles area, Chicago, Baltimore, and New York, foundational knowledge was constructed about organizational creativity and its relationship to the constructs of creativity, values, and performance (Figure 3). Participant firms were drawn from a stratified random sample of Architectural Record's 2009 Top 250 Firms reporting annual revenues from architectural services only and were invited to respond to an e-survey. Data were collected using an e-survey with 93 items. Correlation and regression analysis examined the relationship of creativity, values, and performance shaping organizational creativity. The study also examined indices for three value disciplines to achieve market leadership proposed by Treacy and Wiersema [29] to test the presence of organizational creativity relative to the value proposition of product leadership.
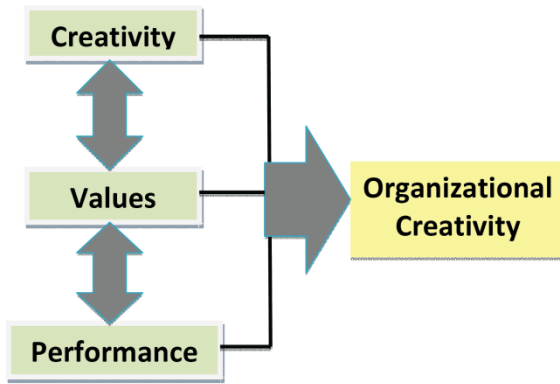
Figure 3. Construct Model Examining the Relationship among Creativity, Values, and Performance as Contributors to Organizational Creativity

The scarcity of research and evidence regarding how creativity affects performance and the relationship of values to creativity in creative professional domains such as architectural practice leaves design practitioners without realistic approaches to using creativity, or creativity research, as a catalyst for change and improved performance. Models which look at the influence of climate factors in the creative work environment have offered confirmation of the extent and locations of creativity in non-design organizations but neglect to provide open-source transformational strategies to be implemented by organizations. Replications and examination of the instrumentation structure of the KEYS questionnaire [5, 14, 26] challenge construct clarity and comprehension surrounding time pressures and freedom. Given the pace of business change since the 1980s, it is conceivable that constructs have been impacted by a transformation of factors contributing to the creative work environment. The problem is, then, to reveal current factors predicting or influencing relationships among the constructs of creativity and performance informing design practitioners where and how leveraging organizational creativity can impact work revenues. This knowledge would inform practitioners in effectively creating flexible and fluid organizational structures to enhance creativity and as a result successfully meet the demands of rapid change in the marketplace. Successful organizations in the global economy unlock the potential of their organizations, but what is the key to creativity as a leveraging factor, and even more important, what does it unlock?

Findings

Respondents encompassed the full range of positions in large architectural practices located in urban locations in the west, mid-west and eastern USA. An overwhelming majority identified themselves as creative. They received annual salaries commensurate with their positions; 22 respondents earned more than expected annual income over $105,000 (26%). The most frequently (mode) reported salary range was $45,001-$65,000. Females in these firms held positions approximating percentages reported by the American Institute of Architects for executive level positions and demonstrated increased percentages of participation as they held higher positions in the firm, similar to that of male counterparts in the same positions. Females did reflect a slightly higher representation as positions advanced to executive levels, atypical of the career path in architecture for women. Over half of participants held architectural degrees with a few holding international architectural credentials (education or professional organizations). More than half of respondents had experience in the corporate/ commercial, education, residential, and retail market segments.

Findings suggest that creativity has a fragile relationship to performance, contradicting the study by Eskildsen, Dahlgaard, and Norgaard [15] in which they found no direct relationship between organizational performance (business excellence) and organizational creativity; rather, organizational creativity was found to affect organizational learning. Six of ten measures confirmed in earlier climate studies of the creative work environment were found to have poor reliabilities, contradicting findings of earlier studies [3, 4, 11, 18, 19] suggesting differences in creative versus non-creative work venues [14]. Intellectual stimulation, the value discipline of product leadership, and workplace values appeared to have strong influences on a firm's creativity and to a lesser degree, challenging work (Figure 3). In studies of the creative work environment conducted with non-design organizations [24, 26, 30], findings regarding the importance of resources, time pressure, and autonomy relative to work tasks were found to be significant [3, 19]. In the UK a study of advertising agencies noted that although employees identified stress in the environment, this characteristic was not identified as a negative influence [14]. The strongest factors influencing organizational creativity were a combination of intellectual stimulation and product leadership value proposition as well as specific workplace values. This reflected the best relationship and explained 74% of the variance in the regression model; and challenging work to a lesser extent (Figure 4).
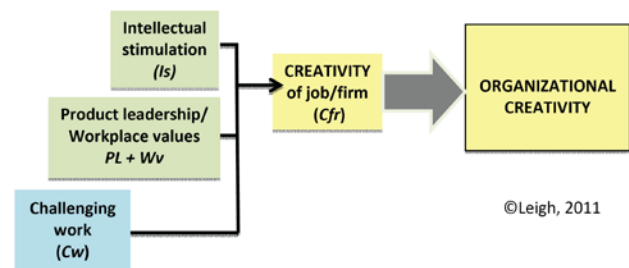

Figure 4. Influences on Organizational Creativity

A Firm Creativity Profile is currently being developed from specific measures used to reveal factors influencing organizational creativity to evaluate an organization's areas for improvement. Using this tool at the firm level may point out critical areas for which strategies are needed. As one study participant noted from the research questions, he could identify areas that could be enhanced but not necessarily how or where to start to go about increasing creativity in their practice. Interestingly, this firm's principals considered it very creative, but employees repeatedly noted "talking the talk but not walking the walk."

CONCLUSION

Creativity is highly valued at both the individual and organizational level. Not surprisingly, there has been

considerable research on the topic of creativity but not focused on design. Results from two empirical research studies were reported in this paper. At the individual level, a design studio project revealed that high creativity students were motivated, utilized multiple research venues, and employed a variety of problem solving techniques to a greater extent than low creativity students. At the organizational level, survey responses by participants working in design firms showed that intellectual stimulation, product leadership/workplace values, and challenging work strongly influenced creativity.

Based on the results of these two studies rooted in design education (individual) and practice (organizational), tools can be developed to enhance individual skills and awareness as well as aid organizational change related to creative output. Outcomes from tools measuring creativity can then be used by both individual design practitioners and design firms to first establish a baseline level of creativity and to facilitate a focused direction regarding where to advance efforts relating to creative stimulation and environmental values. Further studies could be developed to assist firms in implementing necessary changes to maintain relevance in an increasingly competitive economy. Research from practice can increase the body of knowledge for both practitioners and academicians leading to greater levels of creativity.

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