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Anticipate, Embrace, and Leverage Ambiguity

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ABSTRACT

In his seminal book Conceptual Blockbusting, James L. Adams stated that an emotional block to creativity is the "inability to tolerate ambiguity,... [having] an overriding desire for order and [having] no appetite for chaos." Tolerance for ambiguity can be defined as the degree to which an individual is comfortable with uncertainty, unpredictability, conflicting directions, and multiple demands. Developing new products creates ambiguity. Unfortunately, modern organizations are ordered around the principle of doing things that are efficient, repeatable, and reliable. The fundamental problem with trying to be creative is that it is none of those things. Higher education is one modern organization that does not encourage students to develop a tolerance for ambiguity but instead strives to eliminate ambiguity from students' educational experience. How a person deals with uncertainty and the stress of an ambiguous situation is an important consideration in the life, education, and professional practice of an industrial designer. An industrial design student with a low tolerance for ambiguity, who is seeking opportunities in the professional world, is bound to feel stress, anxiety, and frustration. This paper defines tolerance for ambiguity to create awareness of its influence on the success of students who are studying industrial design. Recognizing and developing opportunities for students to anticipate, embrace, and leverage ambiguous situations is important to students' success as they move from the educational experience into professional life.

Keywords: Tolerance for ambiguity, Industrial design, Education, Uncertainty, Categorization, Novelty, Changing stimuli, Change, Resistance to closure

INTRODUCTION

I had a couple of experiences with industrial design students and alumni early in my educational career as a professor. The first was a conversation with an individual who had graduated 10 years earlier with a degree in industrial design from a well-respected university. During the conversation, this person indicated that they were not working as an industrial designer and explained that their education had not prepared them for the "real" world of industrial design. After graduation, they had been hired by General Electric and were given an entry-level project. They admitted they had not known where to start because the project had not been presented in the same way their school design program projects had been and did not follow the process they had been taught and had practiced in school. As they struggled with the project, and with group dynamics, they became more and more frustrated. After 6

months, the individual quit the job and has not worked as an industrial designer since. In another conversation a few weeks later, this same person told me that they were interested in teaching industrial design. They said sarcastically, "I would give the students 'real world' experience; I would assign a project on Friday, and on Monday I would change it, cut the budget, or cancel the project." A professor in the industrial design program at the university this student attended said that the student had very good skills and was creative. The student certainly had a portfolio that was good enough to secure a desirable design job (Skaggs, 2002). What went wrong?

The second experience was with an industrial design student I found crying at their desk. "I don't think I can do this," they proclaimed. The industrial design curriculum, like the curriculum in many schools, teaches fundamental skills during the sophomore year, and students experience the design process during their junior year. This student had learned all the skills but was finding it hard to apply those skills to a more complex design project. What went wrong?

The problem was not that their training was inadequate. Rather, they lacked the ability to deal with the subtle complexities of the world of industrial design. They had the skills, knowledge, and methodologies but not the fundamental personality characteristics vital to practicing design.

In his book *Conceptual Blockbusting*, James L. Adams (1986) stated:

The fear of making a mistake is, of course, rooted in insecurity, which most people suffer from to some extent. Such insecurities are also responsible for the next emotional block, the "inability to tolerate ambiguity, . . . [having] an overriding desire for order; and [having] no appetite for chaos." I am not suggesting that in order to be creative you should shun order and live in a totally chaotic situation. I am talking more of an excessive fondness for order in all things (p. 45).

These students' experiences with design highlighted a problem that they were unaware of, a problem beyond their skills, knowledge, and methodologies. Industrial designers work at the fuzzy end of product development, where many factors are undefined and can change rapidly and where there is uncertainty and unfamiliar spaces. A designer must be able and willing to embrace ambiguity, paradox, and uncertainty (Gelb, 1998). Tolerance for ambiguity suggests a certain lack of rigidity in thought processes that is important for an industrial designer.

TOLERANCE FOR AMBIGUITY

Tolerance for ambiguity is the ability to perceive in a neutral and open way uncertainties, contradictory issues that may be difficult to understand, and vague information with contrary or multiple meanings (McLain, Kefallonitis and Armani, 2015). However, as mentioned previously, not everyone has this natural tolerance, and it is important to recognize industrial design students who may be struggling with ambiguity.

Zack Bennett, a designer at Fahrenheit Design in Austin, Texas, said, "In the work world of industrial design, schedules are shifting, budgets expand and contract, and product requirements change. Designers must work with

changing parameters. At Fahrenheit studio they have a traffic light in the conference room with all three lights lit as a reminder of the importance of embracing ambiguity" (personal communication, 2019). As another example, IBM's Experience Design Center in Austin, Texas, displays a poster to remind designers about ambiguity. It reads "Learn to anticipate, embrace, and leverage ambiguity" (Depgen, 2000). This is a great motto for industrial design students. What does it mean to anticipate, embrace, and leverage ambiguity?

WHAT DOES IT MEAN TO ANTICIPATE AMBIGUITY?

"To anticipate" means to regard as probable, to expect or predict (Merriam-Webster). One of the four rules of design thinking is the ambiguity rule: It states that ambiguity is inevitable—that we should experiment at the limits of our knowledge, the limits of our ability to control events, and with the freedom to see things in a different light (Meinel and Leifer, 2012). In the industrial design profession, ambiguous situations are not only probable but can be expected and even predicted.

The creation of new products in which industrial design plays a role is crucial in the world of commerce. To stay competitive, product development firms must continually produce new products. Risk and uncertainty levels fluctuate throughout the process of developing a new product. The "fuzzy front end" of the process in particular is full of ambiguity and uncertainty. Research has revealed that the way businesses handle ambiguity may be connected to the success of their products (Frishammar, Florén and Wincent, 2011).

WHAT DOES IT MEAN TO EMBRACE AMBIGUITY?

"To embrace" means to accept or support an idea willingly and enthusiastically (Merriam-Webster). We use the term "tolerance for ambiguity," but tolerance suggests enduring when what we really mean is the ability to accept and even appreciate the value of ambiguity.

Tolerance for ambiguity is frequently mentioned as a crucial trait for leaders involved in new product development (Cohen, March and Olsen, 1972). Research has shown that leader tolerance of ambiguity is associated with better follower performance outcomes. When leaders characterized ambiguous work situations as challenges rather than hindrances, followers approached these tasks with a more positive orientation. Findings imply that when tolerance of ambiguity in leaders is evident, followers have practical reverence for leaders seeking to adapt to the situational needs of their people and projects (Cohen and March, 1986).

The American Council on Education has stated that the ability to function effectively in an ambiguous, complex, and rapidly changing environment is a critical skill in industry (quoted in Greenhaus and Callanan, 1996). Morgan (1997) argued that organizational intelligence "uses, embraces, and at times creates uncertainty as a resource for new patterns of development" (p. 92). Research has found a significant and positive relationship between creativity and tolerance for ambiguity (Tegano, 1990).

Therefore, behaviors critical for survival in organizations, such as innovation, creativity, adaptability, entrepreneurship, flexibility in negotiation, and other change-oriented goals, are best achieved by people who have a tolerance for ambiguity and uncertainty (Dollinger, Saxton and Golden, 1995).

Industrials designers are hired for their ideas, and they develop new and useful ideas using principles of creativity. Vernon (1970) considered the ability to tolerate ambiguity to be a crucial component of creativity. According to Vernon, the ability to tolerate ambiguity encourages creative thoughts and actions because it empowers people to reject imperfect or subpar solutions. People who are ambiguity tolerant may be able to work productively on a wider range of stimuli or situations, including those that are ambiguous, whereas people who are not ambiguity tolerant will ignore or disregard new stimuli or situations. In fact, ambiguity tolerance enables people to maximize their creative potential. Other researchers have suggested that the more individuals tolerate ambiguity, the more creative they are (Barron and Harrington, 1981; Golann, 1963; Sternberg and Lubart, 1995; Urban, 2003). This theory is based on the idea that situations requiring creative thinking often involve ambiguity, thus, tolerance of ambiguity enhances creativity. Tolerance of ambiguity allows individuals to continue to grapple with complex problems and remain open and increases the probability of finding novel solutions. For example, Comadena (1984) examined the creative performance of 76 undergraduates in brainstorming groups and observed that tolerance of ambiguity was positively linked to the number of ideas produced. Given these results, it would be helpful to test the relationship between tolerance of ambiguity and creativity in students with measurements such as the originality of productions.

In the past, only creative endeavors required a high tolerance for ambiguity and uncertainty. Today, ambiguity and uncertainty have become more prevalent as change and complexity in the world accelerate. One of the keys to efficiency in a world that is changing quickly is the ability to anticipate, embrace, and leverage ambiguity (Gelb, 1989).

WHAT DOES IT MEAN TO LEVERAGE AMBIGUITY?

Leverage" something is to use it to its maximum advantage (Merriam-Webster). One way to leverage ambiguity is to create ambiguity where it does not exist, a practice used in several creativity techniques. Most creative techniques work to increase flexibility of thought by forcing a different point of view, or by introducing ambiguity.

When it comes to creativity, "making the strange familiar and the familiar strange" is applicable because the goal is to inspire people to take an original approach to solving problems by imposing an element of ambiguity. This idea is credited to German poet Novalis (1772–1801), who explained that artists seek out mysterious features in familiar items while at the same time looking for recognizably ordinary traits in the unusual.

Following are two examples of creative tools that demonstrate this imposed ambiguity. The first tool, brainstorming, engages problem solving and design as an imaginative, playful, and ambiguous activity rather than as a

rational one. The now-common practice of brainstorming was developed by advertising executive Alex Osborn in 1942 and draws on four guiding principles: (a) avoiding criticism, (b) fostering crazy ideas, (c) prioritizing quantity over quality, and (d) mixing and expanding on ideas from different group members. According to Osborn's theory, ambiguous free association should be promoted rather than curtailed (Osborn 1953).

The second tool, vertical thinking, was created by psychologist Edward de Bono (1971) his book contrasts vertical and lateral thinking. De Bono referred to vertical thinking as a type of approach to problems that usually involves being selective, analytical, and sequential, since a strong logical analysis has a high likelihood of producing a predictable result. The objective of lateral thinking is to deliberately view a situation from an unexpected and occasionally ambiguous perspective. Lateral thinking can be purposefully provoked (by using a random word or image stimulus) or implicitly shaped by a playful attitude that attempts to surprise, shock, or disrupt a situation.

The design process leads to uncharted territory. To pursue what we do not already know, it is necessary to have a sense of wonder, the patience to suspend judgment, and a tolerance for ambiguity. Dealing only with the clearly defined and the familiar precludes the plasticity and adaptability of thought necessary in any imaginative endeavor. Tolerating ambiguity allows an individual to accept uncertainty, disorder, and the paradoxical in the process of ordering their thoughts. Leveraging ambiguity allows a designer to view the world with more curiosity and invites exploration and experimentation, which leads to discovery and a new way to view the world.

ORGANIZATIONS AND TOLERANCE FOR AMBIGUITY

Over time, it is human nature for people to become comfortable with certain ways of doing things and to resist deviating from familiar patterns. Organizations also develop systems, processes, and procedures that cause them to become less flexible as their processes become more defined and refined (Hannan and Freeman, 1989). These defined and refined processes build safety and efficiency but are not conducive to flexibility and change. This organizational intolerance for ambiguity increases with the age and experience of the organization (Levinthal, 1991).

For example, in higher education, as principles and processes are passed from one generation to another, they become an integral part of the institution (Lane and Klenke, 2004). This phenomenon is evident in educational approaches: for the most part, education works to eliminate ambiguity. Most tests or other rubrics for evaluation are defined in such a way that there is one right answer. It is A, B, C, or D; true or false. Students are expected to repeat back what was determined to be important to learn (Evans, 2004). Learning outcomes define exactly what will be taught and what is expected to be learned and retained from a course.

As a result of these prescribed learning outcomes and answers, many students have developed an aversion to ambiguity. In a course-structure questionnaire given to students, students listed the following 8 items as critical components of a successful course (DeRoma, Martin and Kessler, 2003): (a)

presence of course syllabus, (b) presence of clear schedule of assigned readings, (c) dates for testing scheduled in advance, (d) clear outline for lecture topics, (e) adherence to lecture topic for a particular lecture, (f) specific grading criteria outlined in advance, (g) exams emphasizing mastery of knowledge, and (h) exams/exercises involving objective versus subjective reporting. Johnson, Court, Roersrna, and Kinnanian (1995) have recommended that undergraduate teachers examine their courses and foster tolerance for ambiguity as an important criterion for the development of flexible, integrative, and independent thinking.

INDUSTRIAL DESIGNERS AND TOLERANCE FOR AMBIGUITY

What does this all mean? In sum, (a) educators should be aware of the importance of tolerance for ambiguity and its influence on the success of industrial design students, (b) students need to recognize their own tolerance for ambiguity or the lack thereof, and (c) faculty must work to develop curricula that provides students with opportunities to experience and practice ambiguity.

As educators become more diligent about incorporating ambiguous situations into their classrooms, they should be mindful of students who may be averse to ambiguity. Students who are uncomfortable with ambiguity need to know exactly what is expected of them, and they want to see examples of quality work. They ask an inordinate number of clarifying questions. They struggle with vague or general guidelines and are uncomfortable with using a variety of means, methods, or processes to achieve the desired outcomes. They seem uncomfortable with multiple solutions and are overly concerned about the right answer. They want to select solutions early and defend them actively and cannot find a balance between novelty and usefulness. Additionally, these students focus only on the details of the assignment they understand, and they create their own boundaries, definitions, and parameters to work within.

CONCLUSION

Tolerance for ambiguity can be defined as the degree to which an individual is comfortable with uncertainty, unpredictability, conflicting directions, and multiple demands (Budner, 1962). Tolerance for ambiguity is manifest in a person's ability to operate effectively in an uncertain environment. Some people may have a more natural predilection toward tolerance for ambiguity, while for others this tolerance develops over time through education and experience. Some people strive daily to simply eliminate ambiguity in their lives. However, ambiguity exists in different degrees and for varying periods of time in situations and organizations everywhere. Oreg, Nevo, Metzer, Leder and Castro (2009) found a correlation between careers individuals choose and the tolerance for ambiguity associated with that professional opportunity. How a person deals with uncertainty and the stress of an ambiguous situation is an important consideration in the life, education, and professional practice of an industrial designer. It is vital for industrial design students to understand this concept because a student possessing intolerance

for ambiguity, who is seeking opportunities in industrial design, is bound to feel stress, anxiety, and frustration.

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