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Investigating the Creative Cognition of Craftsmen for the Improvement of Design Education

Abstract

Our goal is to provide resources for the development of a design education method for traditional craftsmen (a nationwide, governmental Human Resource Development program that operates in developing countries). We investigated potential creative barriers (i.e., cognitive fixedness) in people who possess traditional/conservative viewpoints (traditional craftsman). First, we observed the creative learning processes of children in traditional craft villages in which deep-rooted actions and attitudes were internalized. This observation illustrated how cognitive fixedness from a conservative viewpoint is formed during childhood. Second, we investigated cognitive fixedness based on the associative concepts of craftsmen and designers (design trainers) as they conceptualized their ideas during the early stages of idea generation. We employed a concept network analysis based on the associative concept dictionary to extract verbalized thoughts. We asked both the craftsmen and design trainers to imagine how they would design a fruit bowl. When they imagined their fruit bowl design, the craftsmen's associative concepts placed greater focus on the product's appearance and technical aspects, such as *Operation* (i.e., replace, reduce, etc.) and *Shape* (i.e., waist, body, etc.). In contrast, the design trainers' associative concepts paid greater attention to issues related to surroundings, such as *Scene* (silverware, norm, etc.) and *Appeal* (fresh, dish, etc.). This demonstrated that the design trainers tended to use more remotely associated concepts (polysemous words) that had greater probability of achieving unconventional ways of thinking. Conversely, traditional craftsmen tended to use more closely associated concepts that represented a narrow commitment to the particular issues with which they were familiar (cognitive fixedness in technical and object property). Last, to empower the craftsmen's closely associated concepts (cognitive fixedness), we conducted a design experiment in which traditional wooden sandal craftsmen were asked to create a new design for a traditional wooden sandal. We observed two stages of idea generation. During the first stage, craftsmen were challenged to generate their conservative ideas at an extreme level. In addition, conceptual sketches and frequently verbalized thoughts related to unfamiliarity or skepticism were examined by the design trainers. In most cases, the unfamiliar stimuli verbalized by the craftsmen, such as "painful," "broken," and "upside-down," resulted from an extreme level of cognitive fixedness. During the second stage, the craftsmen redeveloped their thinking and were compelled to utilize the unfamiliar stimulus. This experiment demonstrated that the ability to capture and utilize unfamiliar stimuli when challenging extreme levels of cognitive fixedness might lead to unconventional ideas, for example, an upside-down wooden sandal design. We realized that the unfamiliar stimuli generated by an extreme level of cognitive fixedness (i.e., broken shape, painful shape, upside-down shape) were remotely associated concepts that had the potential to generate unconventional ideas. In the state of extreme of cognitive fixedness, the craftsmen unconsciously encountered dialectical beliefs, a state in which their conservatism became less rigid. This meant that they were not just thinking of object properties and technical terms, but were also engaged in more abstract thinking and consideration of surrounding issues (*Appeal* or *Scene*). However, in order to avoid narrow or closely associated concepts and to create more intrinsic experiences that access remotely associated concepts at an in-depth cognitive level, the craftsmen must experience dialectical beliefs in a familiar manner. Therefore, we propose an improved design training program that can be embedded within a tourism-based craft workshop-like setting. The visitors, or consumers, would be knowledge contributors who become co-creators with the craftsmen in the design activity. Challenges to extreme levels of cognitive fixedness would result from the presence of knowledge contributors who bring episodic recreational behavior, such as styles, mood, and curiosity. Ultimately, the knowledge contributors would continually challenge cognitive fixedness in order to access remotely associated concepts.

Keywords:

Creative Cognition, Cognitive Fixedness, Traditional Craftsmen, Design Education and Training, Knowledge Contributor.