Chapter 9
Brainstorming in Virtual Teams

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ABSTRACT

Most research is conducted by teams rather than individuals, and due to a variety of technological advances many research teams do not work face-to-face; they work virtually. The creativity literature that explores how working as a member of a virtual team differs from working as a member of a face-to-face team or as an individual is reviewed in this chapter, with a focus on the idea generation phase of the research process. The chapter offers practical techniques to help researchers effectively and efficiently brainstorm in virtual teams. Specific techniques to guide researchers are offered based on laboratory and field research in electronic, face-to-face, and virtual brainstorming.

INTRODUCTION

Conducting a research project is such a complex and creative task that researchers often collaborate rather than working alone. Across a variety of disciplines, teams publish more papers and their papers are more frequently cited than individuals (Wuchty, Jones, & Uzzi, 2007). Finding collaborators close in physical proximity with the necessary skills, knowledge, ability, and motivation to complete the research project may be difficult. Forming virtual teams (VTs), researchers can collaborate with others who are highly qualified, regardless of their location. The purpose of this chapter is to review the literature on brainstorming in VTs with the goal of providing urban and planning studies researchers with guidelines for effective VT brainstorming.

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TEAM CREATIVITY

Although there are many techniques purported to increase creativity [e.g., attribute listing, morphological analysis, force field analysis, mind mapping, idea checklist; see Nemiro (2008) for

a review of each and how to apply the techniques in VTs], much of the laboratory research that has examined idea generation has relied on the brainstorming paradigm. Group or team members are instructed (a) to generate as many ideas as they can, (b) to say anything and everything that they think of, (c) to integrate ideas that have been presented into better ones, and (d) not to criticize their own or others' ideas (Bouchard & Hare, 1970; Osborn, 1957). Osborn found, as did others (Meadow, Parnes, & Reese, 1959; Parnes & Meadow, 1959), that brainstorming groups produce more ideas than other kinds of groups (e.g., critical groups or non-brainstorming groups), but he also believed brainstorming groups could generate more and better ideas than individuals working alone. In fact, Osborn (1957) predicted that if group members followed these brainstorming rules, they would generate twice as many ideas than if the members had worked alone, although alternating between individual and group brainstorming would yield the better results.

According to several models of brainstorming (e.g., Brown & Paulus, 2002; Nijstad & Stroebe, 2006,;Paulus & Dzindolet, 2008) in order to generate ideas, individuals must search their memories for a category of knowledge that is relevant to the problem. Ideas are generated within the selected memory category until that category is "tapped out" or attention is switched to a different category for some reason. New memory categories are searched for and ideas are created until they are "tapped out" or attention is diverted. Several models of brainstorming suggest that brainstorming in a group or team can stimulate people to search memory categories they might not otherwise have considered, and specific ideas that are shared by one member can stimulate related ideas or be combined with ideas that have been presented earlier (Brown & Paulus, 2002; Nijstad & Stroebe, 2006).

However, brainstorming groups do *not* always generate more ideas than the combined output of an equal number of people brainstorming separately (i.e., nominal groups: Mullen, Johnson, & Salas, 1991). Although other group members' ideas offer cognitive stimulation that can lead to synergy, there are a few negative forces that groups have to deal with. Brainstorming teams may not generate as many ideas as individuals due to production blocking, a consequence of the fact that only one member of a group can speak at a time (Diehl & Stroebe, 1987, 1991; Nijstad & Stroebe, 2006). While listening to others and waiting to speak, one may forget an idea one wanted to share or decide not to share it with the group because it may seem too similar to an idea that another group member has generated or too dissimilar from the current topic. Group brainstormers tend to generate ideas in a smaller set of topics than individuals, limiting the range of ideas they generate (Larey & Paulus, 1999). Waiting to speak may interrupt the flow of ideas one needs to be creative. Finally, evaluation apprehension (fear of being negatively evaluated; Camacho & Paulus, 1995) and social loafing (exerting less effort when performing a task as group than alone; Karau & Williams, 1993) may decrease the number of ideas generated by teams.

For urban and planning studies research teams to generate creative research hypotheses, models, and research designs, they should attempt to minimize evaluation apprehension (which the brainstorming rule directing members not criticize ideas attempts to do), set up some degree of accountability to reduce social loafing, and encourage the exchange of ideas in an efficient manner with as little distracting material as possible (Paulus, Nakui, Putman, & Brown, 2006; Putman & Paulus, 2009). In addition, there is evidence that deconstructing the task into subtasks (Coskun, Paulus, Brown, & Sherwood, 2000) and providing brief breaks (Paulus et al., 2006) increases idea generation. Alternating between group and individual brainstorming sessions may also increase brainstorming production (Osborn, 1957; Paulus & Dzindolet, 1993). To eliminate production blocking, urban and planning studies research teams may want to communicate elec-