The Influence of Collaboration Setting on Group Problem Construction

Project Description

Problem construction is the process of making sense out of an ill-defined and ambiguous problem (Mumford, Reiter-Palmon, & Redmond, 1994). In models of creative problem solving, problem construction is considered the first step in generating creative and innovative solutions to problems that do not necessarily have a straight-forward solution, or to problems that may have multiple, plausible solutions. Research has shown that when individuals who are considered more effective at problem construction, that is they exert more time, effort, and are more skilled in interpreting and defining problems, they tend to generate more creative and innovative solutions (Fontenot, 1993; Getzels & Csikszentmihalyi, 1976).

Work in the field of creativity and decision-making sciences has primarily examined problem-construction as an individual-level phenomenon, while the role of problem construction in teams is not well understood. In addition to the cognitive processes, however, there is reason to believe that group dynamics could play an important role in how problem-solving teams engage in problem construction. Lack of research on problem construction at the group level may be due to both conceptual and operational issues.

Conceptually, problem construction is described as a cognitive process, and has been traditionally studied at the individual level (Reiter-Palmon & Robinson, 2009). Compared to group cognition, individual cognition is better understood, and researchers seem to agree on a number of its basic principles (Reisberg, 2013). In contrast, group cognition is a new and emerging area of research that focuses on how individuals within a group setting interact to impart knowledge, as well as how knowledge is represented within a group (Gorman & Cooke, 2011). Operationally, there are challenges in measuring group cognition. At an individual level, self-reports, eye tracking devises, and a number of other sophisticated tools have helped us more easily examine individual cognition, however given the dynamic nature of teams, there are additional “moving parts” that must be accounted for.

To date, there has been no published research that has empirically examined problem construction as a group-level phenomenon, therefore we do not know exactly what group problem construction looks like. Reiter-Palmon, Herman, and Yammarino (2008) have suggested that when groups engage in problem construction, their composition is likely to play a role as individual members may vary in terms of their past experiences, personality, knowledge, values, and educational background. Thus, teams composed of members that are diverse on these attributes are likely to frame problems in a unique way. Another issue that comes into play is how teams go about selecting a final problem construction (Reiter-Palmon & Robinson, 2009). For instance, do teams decide on which problem construction gets chosen by employing a democratic process? Also, how do teams integrate diverse viewpoints in constructing the final problem before generating solutions? Given the complexities of group dynamics, facilitation may play a key role in helping us understand group-level problem construction.

Facilitation refers to the process of designing and conducting effective meetings, and has long been a solution in capitalizing on the knowledge of diverse teams (Schwartz, 1994). Modern facilitators commonly rely on software packages known as group support systems (GSS) when conducting meetings. With a combination of skill and having the proper tools, facilitators are able to combat threats to team productivity such as miscommunication, digressions, lack of focus, hidden agendas, fear of public speaking, and meeting dominance by one or more group members (White, 2007). Because these are issues that problem solving teams are likely to face, it would be beneficial to know whether there is evidence supporting value in investing in trained facilitators and GSS technology as it pertains to problem construction in teams.

Purpose of Study

The purpose of this study is to explore how facilitation and GSS influence problem construction as a group level phenomenon. Specifically, in this study I will evaluate whether facilitator (trained or novice) and technology will influence the number of problems generated, and problem quality and
originality. I will also examine how group problem construction influences the quality and originality of the solutions that teams generate.

**Methodology**

The raw data for this project has already been collected, thus already receiving IRB approval. No additional IRB approval is required for data that has been collected and does not include identifying information. Forty 3 to 4-person teams were recruited from business and psychology courses to participate in a “team problem-solving” exercise in which they were asked to identify problems on campus, as a measure of group problem-construction, to identify solutions to those problems, and then come to agreement on a single solution that they thought was the best. That is, a solution which was feasible and would have the greatest impact on campus. This exercise was employed across four conditions (i.e., collaboration settings) using a 2 (facilitator: novice vs. trained) x 2 (collaboration tool: electronic vs. paper) matrix design.

In the novice facilitator conditions, one of the four participants was randomly selected to lead the group in the problem-solving exercise, whereas in the trained facilitator conditions, a trained facilitator who was a member of the Dr. Reiter-Palmon’s research team lead the group in the problem solving exercise. Because we wanted to keep the size of the team constant, all teams contained four individuals, however, in the conditions in which a trained facilitator was used, we only needed to recruit three research participants as opposed to four. In the electronic conditions, the team completed the problem-solving exercise using a tool called ActionCenters, which allowed them to submit their responses electronically in real time. This tool also allowed participants to view other members’ responses as they were submitted. In contrast, the participants in the paper conditions wrote out their responses on paper, and did not share their responses with the rest of the team until instructed by the facilitator. Finally, across all conditions, the facilitator lead the team as they came to agreement on which solution they thought was the best.

The bulk of my project will involve rating the problems that were generated on a number of metrics to examine which conditions were most conducive to team problem construction. For each team, I will examine the number of problems generated by each group, as well as the quality and originality of the problems that were generated using Amabile’s (1996) consensual assessment technique. I will use analysis of variance (ANOVA), a statistical technique, to determine whether the conditions do indeed affect group problem construction in a statistically significant way. Given that data on the quality and originality of solutions will be available from another study, I will also look at how group problem construction influences the solutions that teams generate.

**Project Timeline**

The timeline for this project will be about twenty weeks. In that time I will commit at least ten hours a week on my research project. The following table is a breakdown of how that time will be spent.

<table>
<thead>
<tr>
<th>Task Description</th>
<th>Time Estimate</th>
<th>Time Frame</th>
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<tbody>
<tr>
<td>Literature review, data prep</td>
<td>50 hrs.</td>
<td>May, June 2014</td>
</tr>
<tr>
<td>Rater training, read relevant literature for training, and create materials, rating the solutions</td>
<td>40 hrs.</td>
<td>June, July 2014</td>
</tr>
<tr>
<td>Analyses and interpretation of the data</td>
<td>50 hrs.</td>
<td>August, September 2014</td>
</tr>
<tr>
<td>Prepare findings for presentation</td>
<td>60 hrs.</td>
<td>October, November 2014</td>
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**Student/Faculty Mentor Roles**

The primary role of the faculty member supervisor, Dr. Roni Reiter-Palmon, will be to guide research objectives and ensure that research is conducted in a professional and high quality manner. The primary role of the student will be to set research goals, facilitate data prep and rater training, analyze data, and prepare the results for presentation.
While I commit to completing the proposed project, the stipend of $2,000 will cover my living expenses for the summer and fall of 2014. I plan to work approximately 10 hours per week for a total of 20 weeks resulting in a rate of $10.00 per hour. Over the course of this time, I will read a number of primary academic sources to become well versed in the topic of study, code response data, learn SPSS statistical software, which I will use to conduct my analyses, and write up the results of my study for presentation.

References


Letter of support for Gina Drap

I am pleased to write a letter of support for Gina Drap for her FUSE project. Gina has been volunteering in my research group for about a year now, and has helped on a number of studies. Her duties included data collection, data entry, and coding of open ended responses. The latter is time consuming and a more difficult task, and something that I only allow advanced undergraduate students that have proven themselves to do. Gina has done a great job across the board on all these tasks. The participation in these tasks and regular attendance at research meetings (which I hold bi-weekly) have provided Gina with insight into the research process. As a result, Gina has approached me about conducting a FUSE project.

Gina’s project builds on work that has been done by one of my graduate students that she was very involved with. She will be looking at the relationship between the use of technology and the type of facilitator (novice or trained) on problem identification and construction. My own work has focused on understanding what influences problem construction and her work fits well with the work conduct by my lab (my own work, graduate student work) and she will contribute to this line of work.

I am happy to mentor, advise, and support her in this research endeavor. Please let me know if you need additional information.

Sincerely,

Roni Reiter-Palmon, Ph.D.
Professor, I/O Psychology