Virtual Teams and The Group Creative Process

How does the group creative process function in a virtual team environment?

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Abstract

The purpose of this paper is to explore group creative processes in a virtual environment to better understand how virtual communication influences creativity. After reviewing literature, a theoretical foundation in creativity was established and with three common themes derived: Task motivation and task orientation, social environment and participation, and communication. This was coupled with a review of current virtual team interaction theories, demonstrating intersections between them.

The method used was a qualitative exploration using semi-structured in-depth interviews. The interviews were conducted via VOIP, with notes and recordings taken for further analysis. Analysis was conducted on the three common creative themes viewing virtualization as the mediator. Trends emerged demonstrating that asynchronous communication had a substantial influence on group creative processes. Conversely, virtual teams employing real-time communication found little influence on the creative process. Other anecdotal trends can be seen regarding motivation and social environment. This paper identifies key areas where virtualization influences the group creative process, and provides a base for future suggested research.

Keywords

Creativity, Group Creative Process, Virtualization, Virtual Teams, Virtual Communication, Global Enterprise Experience, Global Virtual Teams
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1 INTRODUCTION

“[O]ur intuition about the future is not exponential; it’s linear. People think things will go at the current pace—1, 2, 3, 4, 5, and 30 steps later, you’re at 30. The reality of information technology, like computers, like biological technologies now, is that it goes exponentially—2, 4, 8, 16. At step 30, you’re at a billion.” (Kurzweil, 2011).

With the stunning success of highly innovative firms such as Google, IBM, and Apple, companies are seeking to find competitive advantage in innovation, and teams have become the dominant format for generating creative outcomes (Kaplan, et al., 2009). As design and product innovation moves downstream and becomes increasingly customer focused, creative techniques that foster collaboration and co-creation from a variety of proficiencies are being encouraged (Chiappetta, 2011). Creativity is a valued asset most companies want to harness and, if possible, sustain as the pace of innovation quickens at a break-neck pace.

All the while technological advances in communication and the increased pace of globalization have introduced a new ways of collaboration (Leenders, et al., 2003). Specialized skills can be brought in to a team from almost anywhere in the World (from within or outside the firm) to assist with increased ease and decreased cost through use of virtual platforms.

“[N]ew knowledge can only be created when existing bases on knowledge are disseminated through interaction between specialists with varying areas of expertise, innovation is mainly an information processing activity” (Leenders, et al., 2003, p. 70).

Essentially, virtualization allows for greater access to knowledge pools located around the World. The incredible flexibility of IT platforms has made virtual teams invaluable to organizations of all sorts (Johnson, et al., 2001). Since computer information technology facilitates the spreading of information, it makes sense that most organizations would flock to embrace IT in the face of globalizing industries to remain innovative and competitive.

There is a long standing struggle to model the creative process in both individuals and groups. It has led to a significant body of research still being expanded on, and with
plenty of room to grow. And while many researchers are focused on unfolding the various aspects of creative processes, little is known about how group creativity functions in a virtual environment. This is the point of interest to be investigated in this research. The following Theory chapter is an extensive literature review containing some background on team theory and current virtualization theory. The core of the Theory chapter is the outline of five approaches to group creativity process modelling. While these five approaches have some strong differences, certain similarities, or themes, are shown to emerge. There are 3 themes, namely: Task motivation and task orientation, social environment and participation, and communication. These themes were then used to conduct and analyze the interviews to understand the nature of creativity in a virtual context. As part of a broader research on Global Virtual Teams, overseen by Prof. Lena Zander, this research is based on a group of interviews conducted on participants of the 2013 Global Enterprise Experience Case Competition (GEE). The competition is conducted in virtual teams, all working on a set deadline to come up with a sustainable project. The Methodology chapter explains in detail the research design, the nature of the GEE Competition, and the ways in which the interviews were conducted and analyzed as well as limitations of the research. The next two chapters present the results from the interviews and a discussion to analyze the findings, respectively. The conclusion discusses the implications of this research (both practical and theoretical) as well as providing recommendations for future research. A graphical representation of this structure is shown below:
1.1 Statement of Purpose

Group creative processes are extremely social in nature and virtual technologies play a mediating role as the conduit by which communication is passed. To better understand how teams function creatively in a virtual context we shall investigate the group creative processes within the virtual environment. Team creativity is dependent on the sharing of ideas between team members suggesting that any affect, whether enhancing or detracting, on that interplay may have an effect on the creative process and, indeed, creative outcomes. While measuring the success of the creative outcome is beyond the scope of this research, interviews from individuals who worked within entirely virtualized teams may help shed light on how creative process behave within a virtual context.

Below is a diagram illustrating the mediating factor of virtualization.

![Diagram](image)

Specifically, we will look at the factors affecting the virtual platform, communication, and its effect on creative processes. By creative processes we refer only to the group creative processes and not individual processes.

Research Question: How does the group creative process function in a virtual team environment?

We will address this wider research question by breaking down the group creative process into three themes, based on existing theory.

Theme Based Sub-Questions:

1) How is task motivation and orientation influenced by virtualization?
2) How is team participation and social interaction influenced by virtualization?
3) How does virtualization influence team communication?
It should be noted that this research paper is exploratory. We are studying formal teams brought together to accomplish a specific task, and investigating a specific aspect of their interaction. The factors that compose the group creative process in a virtual environment have not been investigated directly before, and are not clearly defined. This reason provided the initial motivation for researching this phenomenon, but also means our conclusion will comprise of potential trends and suggested connections.
2 Theory

The following is a comprehensive overview of the current theories pertaining to virtualization and creativity. The purpose of this is to explore what is known about group creativity phenomena and identify where there is key overlap between theoretical approaches. From there we drew conceptual links between virtualization and creativity theories. These links were then used to shape and analyze the interviews conducted on the GEE participants.

2.1 Virtual Teams

Virtual teamwork is a well-accepted concept in the modern workplace; a recent literature suggests that virtual teamwork plays a critical role in the modern organization (Gilson, et al., 2013). The increasing ubiquity of virtual teams speaks to the fact that talent no longer needs to converge on a specific location but rather can be tapped at little expense from multiple locations simultaneously. In fact, many organizations rely heavily on virtual teamwork (Martins, et al., 2004), with more than 60% of professionals working virtually to some extent at the turn of the millennium (Kanawattanachai & Yoo, 2002).

The virtualization of teamwork is attributed to two major factors: Technology (Solomon, 2001), and changing organizational structures (Townsend, et al., 1998). As technology developed from niche to mainstream and the rate of globalization increased, the pressure on firms to perform increased as well. Firms adjusted their internal structure and skill requirement to make gains in global efficiency and profit. This, in turn, affected face-to-face teamwork within the firm, prompting a shift to virtual teamwork (Townsend, et al., 1998). Further to this, the virtualization process increased flexibility in terms of working hours and location. Specialist skills could be brought into a firm ‘virtually’ and on an ‘as needed’ basis, increasing the quality of results. Skilled workers dissatisfied with work hours found a viable alternative, increasing employee retention (Cascio, 2000). It is this convergence of usable technology and organizational developments that spurred the surge of virtualization (Solomon, 2001).
There are many definitions of what constitutes a virtual team. Some definitions distinguish virtual and face-to-face teams entirely on physical separation, using available technology to interact with one another (Martins, et al., 2004). An example would be Rogelberg’s definition of a virtual team as “a group of individuals who work interdependently, are located at a distance from each other, and conduct most of their collaboration through communications technology (rather than face-to-face)” (Rogelberg, 2007). Any group of collaborating individuals who do not work face-to-face and are separated by geographic distance (any significant distance) are thus considered a virtual team. Teams may be synchronous (same time zone) or asynchronous (in different time zones) and may work together for just about any period of time. A virtual team may also work with real-time or non-real-time (email, social media, etc.) communication, regardless of synchronicity (Rogelberg, 2007).

Other definitions of virtual teams have arisen which factor in a combination of face-to-face and distance teamwork in which team members collaborate closely regardless of physical, chronological, or organizational barriers (Johnson, et al., 2001). In an attempt to define at what level of separation a team becomes virtual, theorists noted that the modern face-to-face team still uses technology associated with virtualization. From this, the definition of virtualization has become a scale which depicts the ‘extent of virtualness’ within a team (Martins, et al., 2004). The team’s position on this scale changes depending on the type of task, complexity of task, and demands of task. Their position is also affected by the technologies used (Bell & Kozlowski, 2002).

Griffith et al. progressed from this to create the most widely accepted definition of what constitutes a virtual team by accepting the fact that they are foremost a team which, secondarily, operates in a virtual environment (Martins, et al., 2004). By doing this three key boundaries were identified: Locational, Temporal, and Relational. The Locational boundary literally refers to the physical separation of the team members. The Temporal boundary refers to both the time difference between team members (commonly known as synchronicity) and the lifecycle of the team itself. The Relational boundary refers to each team members’ connection to one another, as well as their wider network (Griffith, et al., 2003). From here we establish our accepted definition of a Virtual Team as:
A team whose members use technology to varying degrees in working across locational, temporal, and relational boundaries to accomplish an interdependent task (Martins, et al., 2004)

2.1.1 Dynamic Group Process
From there we can draw comparisons between virtual and face-to-face teams. Martins et al. conducted a meta-analysis of all the major studies looking into virtual team behavior as of 2005. As part of this analysis he used Weingart’s “Dynamic Group Process” concept and analyzed the key issues faced in virtual teams versus face-to-face teams. This framework is currently the foremost process model for virtual teams. The term “Dynamic Group Processes” is defined as the factors that a team must address to achieve their goals, through aggregating group behavior (Weingart, 1997). These can be divided into three process groups: Planning, Action, and Interpersonal. The following descriptions show the difficulties virtual teams encounter as opposed to face-to-face teams.

<table>
<thead>
<tr>
<th>Planning Processes</th>
<th>Action Processes</th>
<th>Interpersonal Processes</th>
</tr>
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<tbody>
<tr>
<td>- Task Analysis</td>
<td>- Communication</td>
<td>- Social Integration</td>
</tr>
<tr>
<td>- Goal Setting</td>
<td>- Coordination</td>
<td>- Trust</td>
</tr>
<tr>
<td>- Strategy</td>
<td>- Participation</td>
<td>- Group Cohesion</td>
</tr>
</tbody>
</table>

Planning Processes: The key issues identified are the difficulties in achieving a shared vision and time taken to form a solid analysis and plan of action. Specifically, formal Goal Setting is positively related to all other aspects of the planning process (Huang, et al., 2002). However, asynchronous communication and cultural separation was found to increase difficulty in forming a shared purpose and drive (Blackburn, et al., 2003).

Action Processes: It is suggested that communication takes longer to become effective due to reduced social cues and member participation is more equally distributed than face-to-face teams, but also that the higher the state of virtualization, the lower the level of member participation (Martins, et al., 2004). In line with difficulty in creating a shared vision, it is suggested that communication between members is less social than in face-to-face contexts, due to the potential for monitoring (Suchan & Hayzak, 2001). This
equates to higher levels of conflict regarding the formation of task strategy, but lower rates of discussion regarding personal matters. The combination of this increase in efficiency and the digital records of team interactions allow for systematic reviews, retroactively identifying creative processes for future use within the team (Nemiro, 2002).

Interpersonal Processes: Interestingly, and somewhat counter-intuitively, the current research suggests that trust between members develops much faster and to a higher level than with face-to-face teams. Trust then drops rapidly if a member fails to deliver and does not really recover after the fact (Martins, et al., 2004). However, despite the lower levels of social interaction associated with virtualization, team cohesion is increased. This is suspected to be due to increased communication intensity and higher levels of task uncertainty (Ratcheva & Vyakarnam, 2001).

2.2 Creativity

A related search in journal databases yields a wide range of articles loosely discussing creativity in a virtual team context but often in relation to other factors, such as organizational needs or team leadership and cohesion. Among the relevant studies done, a common theme seems to be the shortage of literature or research on the topics of innovation and creativity in virtual teams, or even in traditional teams (Mahotra, et al., 2001; Kaplan, et al., 2009; Ocker, 2005). Adding to the lack of literature is the difficulty in specifying exactly what creativity is and how it can be measured. Innovation and creativity are entangled and often confused with each other, many times bearing overlapping definitions. Attempting to distinguish between the two is important but rather difficult.

Creativity must be novel. In its rawest forms it need not be useful either (consider art or creative acts done for personal pleasure). Team members can chose whether or not to engage in creative processes. These processes are pre-cursors to creative outcomes and innovations (Gilson & Shalley, 2004). Here is one definition of creativity: “the production of ideas that are novel and useful to the organization [...] Ideas are considered novel if they are unique relative to other ideas currently available in the organization, and usefulness is a function of how valuable the idea is to the organization" (DeRue & Rosso, 2009, p. 197).
Compare that to West and Farr’s definition of innovation: “the intentional introduction and application within a role, group, or organization of ideas, processes, products or procedures, new to the relevant unit of adoption, designed to significantly benefit role performance, the group, the organization or the wider society. The element need not be entirely novel or unfamiliar to members of the group, but in must involve some discernable change or challenge to the status quo” (Runco, 2006). Understanding innovation helps us understand which elements are not creativity. One should note the key difference lies in the implementation, and thereby the ability to implement the idea. Innovation requires the “introduction and application” of the idea, paring down which of the ideas generated during the creative process may actually be candidates for implementation (Gilson & Shalley, 2004). While creative ideas are certainly novel, implementation is not part of the creative process whereas it is fundamental to innovation. While they are clearly related and entangled concepts, they must be defined and conceived as separate ideas.

However, the processes by which ideas for implementation are reached are, in essence, still creative processes. Innovation teams have two separate phases which they go through, a generative phase and an evaluative/implementation phase (Baruah & Paulus, 2009). The generative phase is the process of idea generation which is the same regardless of whether one is speaking about creative team processes or innovative team processes. It is the evaluative/implementation phase that may differ significantly enough that the same individuals who were involved in ideation may not be suitable for implementation. While a team responsible for coming up with creative outputs may also go through an evaluative phase to isolate and refine the best ideas, it is also possible that the task is handed over to individuals with more analytical and less intuitive mindsets (Baruah & Paulus, 2009). So we can see that the creative process does not specifically involve implementation, whereas innovation does.

While the previous definition of creativity is quite detailed, we will use a broader definition focusing on the creative acts themselves:
Engagement in creative acts, regardless of whether the resultant outcomes are novel, useful, or applied

(Drazin, et al., 1999, p. 6)

The reason for this is that within this paper we view creativity as processes rather than as outcomes. DeRue and Rosso’s definition views creativity as an outcome. As long as ideas produced are novel and useful, they are considered creative. That approach looks at the result of a process and determines whether or not it was creative ex post. This research will use a process approach which is centered on the steps required to generate such creative outcomes. Emphasis is placed on the specific components required to produce a creative outcome which allows us to try and model these processes and understand how they interact. This approach far better suits an explorative qualitative research by allowing for the mapping of what occurs within the team environment which would otherwise be missed using an outcome based approach.

2.2.1 Process Modelling

Since process modelling has come into favor, many different ways of modeling creativity have been used. Amabile’s componential model has been one of the most influential (Zhou & Shalley, 2003). It centers on a five-stage process and a set of 3 defining components which influence and drive the creative process. The components are domain-relevant skills, creativity-relevant processes, and task motivation. These components are considered essential for the creative process and they combine in various ways to generate creative outcomes (Amabile, 1996).

The first step of the five-stage creative process is the identification of the problem or task. This is followed by a preparation phase where the group prepares for the task by finding or making ready the knowledge they will need. The third step is response generation in which the group creates various ideas to address the problem/task. When they are satisfied with a set of ideas they move on to response validation and communication. In this fourth phase they evaluate the validity of the ideas, and in the final stage, idea selection, they chose which idea to pursue or whether to return to a previous stage. Amabile’s five-stage sequence of response generation is presented in a
linear fashion but is not meant to be strictly linear. It may be the case that participants stop at a certain step and then go back to earlier steps and repeat them a number of times or even start the entire process over after going through all the steps (Amabile, 1996). The five steps are presented in the top row of the diagram below.

![Diagram with five steps: Identification, Preparation, Response, Evaluation, Selection]

The items in the diagram below the response generation process are the three components which directly influence every stage of the response generation process.

### 2.2.1.1 Amabile’s Three Components

**Domain-Relevant skills:** These are the combined knowledge and experience of the individual that allow for the various ways in which a person can think about a problem and thereby synthesize a response. This includes “factual knowledge of the domain in question” (Amabile, 1996, p. 85, emphasis in original) as well as domain-relevant technical skills, talents, and formal and informal education.

**Creativity-Relevant Processes:** Creativity-relevant processes are implicit and explicit methods and strategies for ideation and creating creative outcomes (Zhou & Shalley, 2003). Amabile refers to them as creative heuristics. They are “ways of approaching a problem that can lead to set-breaking and novel ideas, rather than as strict rules that should be applied by rote” (Amabile, 1996, p. 89). Both training and experience in creativity-relevant processes are thought to positively affect creative outcomes.

**Task Motivation:** Task motivation can be categorized as intrinsic or extrinsic. Intrinsic arises from within the individual whereas extrinsic is derived from external sources. For creative processes, intrinsic motivation is necessary suggesting that those with creative potential may not produce creative ideas without proper motivation. It also suggests that the context plays a key role in how creative a person is rather than just a person’s disposition or aptitude for creativity. (Zhou & Shalley, 2003) In particular, it is “freedom...
from extrinsic constraint” (Amabile, 1996, p. 91) that enhances creativity. Extrinsic motivation is actually detrimental to creativity. Extrinsic constraints are factors that influence or control an individual’s performance on a task that are not related to the task itself. They are factors introduced by other people such as management or other figures in the organization. (Amabile, 1996)

2.2.1.2 The Sense-Making Approach
Drazin et. al’s multi-level sense-making perspective approaches from multiple levels of analysis by incorporating the individual level, the group level, and the organizational level (managerial and strategic decisions that confine or allow creativity) (Drazin, et al., 1999). Ideas generated may or may not be considered creative by others but the process the creators underwent is creativity. Creativity is a prerequisite, but not a determinant, of creative outcomes. Of particular interest is Drazin et. al’s view of the intersubjective (group) level of analysis. Individuals at this level develop a shared frame of reference. In the group context, individuals seek understanding of situations they don’t understand from the interpretations of others. As interdependence increases so does the communal frame of reference. In fact, it is through these communal interactions that shared frames of reference are created. However, these frames of reference overlap with other social or organizational groups creating collisions and boundaries, suggesting the process are complex and difficult to map. (Drazin, et al., 1999)

2.2.1.3 The Interactionist Approach
Some researchers have viewed creativity as an interaction between the individual and the environment (Zhou & Shalley, 2003). Proponents of this view also stress that a multi-level approach is necessary to fully understand the contexts that affect the creative process. This interactionist approach sees the individual being cognitively influenced by their context, both the group and organizational level, and experiencing constraints and enhancements to their creative efforts. “From an interactionist perspective, the behavior of an organism at any point in time is a complex interaction of the situation and something else – this something else is the nature of the organism itself” (Woodman, et al., 1993). This overlaps with Drazin et. al’s sense-making perspective which sees the creative process as part of a cognitive attempt to make sense of situations individuals
don’t understand by engaging in the world around them while simultaneously being confined and enabled by organizational decisions and processes.

2.2.1.4 The Synergistic Approach
According to Baruah & Paulus, group creativity may be thought of as a synergy between group members. It is a combination of social processes and individual cognitive processes. Ideas are taken from individuals’ memories and then shared with others in the group who then process the ideas themselves. Without the presence of synergy the result of group creativity would simply be the addition of all the work of a groups individual members. Synergy implies that all the members’ interactions with each other create a better result than would have occurred had they all been working on the task separately. This exchange can be referred to as team interdependence. It consists of exchanges of ideas, information and resources with the purpose of deciding how such ideas and resources will be used within the group and by its members in order to complete the task (Baruah & Paulus, 2009).

The process of sharing ideas between group members is shown to stimulate ideation beyond individual brainstorming (Baruah & Paulus, 2009). There is also some evidence that face-to-face groups may have inhibitory factors which reduce the ability to share ideas, such as, the fact that only one person can share at any given time or that a group member may face social anxiety in a face-to-face context (Baruah & Paulus, 2009).

2.2.1.5 West & Anderson’s Input/Output Model
In a research paper studying innovativeness in top management teams, West and Anderson (West & Anderson, 1996) outlined key factors pertinent to the innovation process. They modelled the process in terms of inputs and outputs, that is, which inputs were key predictors of innovation (as judged by their implementation) within management teams and which processes within the group context were key predictors in achieving increased desired outputs. The following is a brief summary of their model.

<table>
<thead>
<tr>
<th>Inputs: Group Composition and Organizational Context</th>
<th>Process: Clarity and Commitment to Objectives</th>
<th>Outputs: Number of Innovations</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Heterogeneity</td>
<td>- Participation</td>
<td>- Radicalness</td>
</tr>
<tr>
<td>- Size</td>
<td>- Objectives</td>
<td>- Magnitude</td>
</tr>
<tr>
<td>- Group Tenure</td>
<td>- Task Orientation</td>
<td>- Novelty</td>
</tr>
</tbody>
</table>
In regard to group composition group size, team tenure, and the personality/disposition (propensity for innovation) of the members were considered the best indicators for desirable outputs. Group size was recommended to be sufficient but no larger than necessary. Groups of 2-3 members were found to lack diversity of perspectives while groups of 12-13 members were found to be too large to communicate and interact efficiently. Team tenure refers to how long the team has been working together. New members were found to bring in fresh ideas whereas long established teams tended to become less innovative over time. Member personality and disposition has to do with individual group members’ propensity to innovate. The more innovative individuals present on a team, the more innovative the team.

With regard to organizational context, there is evidence to support that an organizational climate that supports innovation has a positive effect on innovation. A supportive climate encourages behaviors that improve individual innovativeness which translates to group innovativeness. The same can be said for teamwork. As for resources and firm size there is conflicting evidence about the impact they have on outputs.

2.2.1.5.1 Description of West and Anderson’s Processes

Member Participation: More participation suggests more sharing of information which can encourage more ideation.

Objective Setting: Maintaining clear and specific group goals is considered the single most consistently important factor among group processes. Group members must be clear on what they are trying to achieve. Having clear objectives focuses the development of new ideas.

Task Orientation: The presence of constructive conflict in which divergent perspectives are managed to stimulate creativity. “Task orientation may be evidenced by appraisal
of, and constructive challenges to, the group’s objectives, strategies, processes, and performance and by concern with high standards of performance” (West & Anderson, 1996). It encourages debate and consideration of alternative perspectives.

Support for Innovation: A group environment which rewards rather than punishes innovation is important. Approval and practical support for both the generation of ideas and their implementation will increase team effectiveness. This includes both verbal and active support.

2.3 Connections between Virtualization and Creativity Theory
While the modal difference between virtual and face-to-face teams has been studied in a variety of ways, the impact virtualization has on creativity has garnered almost no attention thus far. To guide ourselves through this unexplored territory we formed the three common themes. The aggregated factors present in these themes draw a striking resemblance to many elements of Weingart’s Group Dynamic Processes, and can be seen to intersect. The intersections serve as our guide when considering if the influence of virtualization is general to team work, or specific to creativity. These intersections are shown in the diagram below:

![Diagram showing the connections between virtual group dynamic processes and theoretical common creative themes]

Based on our review of creative and virtual theory, we expect to see a significant link between communication and the group creative process. We expect this because various creativity theories specify the interplay between team members as a crucial factor in the team’s ability to be creative. Additionally we expect to see a link between
goal setting and task orientation. Goal Setting is a key aspect of forming a shared direction in virtual theory (Huang, et al., 2002). It is probable that affecting goal setting will affect task orientation and vice versa, which will impact creativity.

As stated earlier, the process of virtualization has a number of effects on team interaction, including interfering with planning processes. There is previous research suggesting that ideas may be shared more effectively when a medium such as a computer is used (West & Anderson, 1996). However, virtualization can also cause problems with goal setting and establishing a shared vision (Martins, et al., 2004). These fragmented effects explained in various studies suggest that the modal change of communication from face-to-face to a virtual platform may have a ripple effect across creative processes. Swapping out the means by which creative processes function has influences hitherto not understood.

As exploratory research, the intention here is to investigate the trends identified above. By conceptualizing the link between existing virtualization theories and the main factors behind the creative process we aim to direct our exploration towards currently accepted ideas, and see if they apply in this specific context. This will hopefully lead to a healthy discussion regarding the key factors at play when a virtual medium is placed between participants. How exactly those factors operate is unknown, but this research may serve as a direction for further work into the study of virtualization and its effect on the creative team process.

2.4 Summary
The theories above show a number of approaches to modelling creative processes. Although there are other approaches still, we feel that the literature reviewed represents a good highlight of the key factors being studied. Because of the lack of a dominant approach with creativity research and the lack of research conducted within virtual environments, it is necessary to draw connections across overlapping portions of literature and pull out common themes which we can then use to investigate creative processes within virtual teams. Three categories of interest have been created which show the common themes within the literature which we found applicable.
Task Motivation and Orientation: The first trend is the concept of motivation. Intrinsic motivation is seen as a key driver for creativity and the absence of it is detrimental to the creative process (Runco, 2006; Amabile, 1996). While intrinsic motivation is not emphasized in the same way among the other theories, it does have some similarity to task orientation. Task orientation can be defined as “a state of interest and engagement produced by task characteristics” (West, 2002). In essence, it is the very nature of the task that brings the group into focus, the intrinsic desire to solve the problem. More importantly, West states “[t]his is very similar to the concept of intrinsic motivation that Amabile argues is so fundamental to creativity and innovation” (West, 2002). The two concepts deal with the individual’s orientation toward the task and their reasons for engaging in it. They both influence intersubjectivity which is mentioned in the sense-making approach.

Social Environment and Participation: Amabile specifically describes the link between task motivation and social environment. She views the social environment as enabling task motivation or placing constraints upon it. The social environment is extrinsic to the individual and can either boost an individual’s intrinsic motivation or detract from it. At the group level both the interactionist and the sense-making approaches view creativity as an interaction between the individual and the environment, predominantly the surrounding group members as well as other organizational members. This in turn inhibits or encourages participation within the group depending on a wide variety of factors including personal anxieties (Baruah & Paulus, 2009), group environment (supportive or punitive) (West & Anderson, 1996), or the stage of team development (DeRue & Rosso, 2009). West and Anderson’s ‘support for innovation’ group process is a direct attempt to account for the social environment within the group which is shown to have an impact on creative outcomes.

Communication: Communication is an action processes in Weingart’s dynamic group processes model. However, it is also implied in group settings and discussions about task orientation and social environment. More specifically though, this research is investigating it’s relation to virtualization and how virtualization affects or changes these activities. Martin et. al predict that the planning processes will be negatively affected by virtualization and a shared vision will be more difficult to establish. This may have an
effect on task orientation as well. Inhibitors to communication can also affect the interpersonal processes which make up the social environment.

The three common themes are the theoretical crux of our investigation, and the basis for forming our theme based sub-questions. By investigating these three themes we will have a better understanding of how the group creative process functions in the virtual environment.

*Theme Based Sub-Questions:*

1) How is task motivation and orientation influenced by virtualization?

2) How is team participation and social interaction influenced by virtualization?

3) How does virtualization influence team communication?
3 Methodology

This aim of this section is to provide a comprehensive explanation and justification for our qualitative research design. Additionally, we cover details of our sample selection, limitations, and ethical considerations. The purpose of this is to fully identify the strengths and weaknesses of our data collection procedure.

3.1 Research Design

This research is being performed as part of a broader quantitative study on Global Virtual Teams, and the Global Enterprise Experience competition, supervised by Prof. Lena Zander of Uppsala University. The aim is to identify and clarify any relationships between the creative process and virtualization. While quantitative studies can provide broad overviews from which generalizations can be made, tacit and social small scale social phenomena can be hard to quantify with metrics and model mathematically. Qualitative research can provide an in depth look at phenomena that might otherwise remain obscure from a quantitative perspective. Specifically, qualitative research is used to collect data that is hard to codify. By focusing on few examples of the phenomena in question, we can drill down to find more tacit and elusive elements often present in social interactions. This is why the qualitative method is most commonly used in the Social Sciences and the study of social interactions (Flick, 2009). We find this particularly suitable for the study of virtual teams and the creative process, due to the non-specific nature of the two phenomena.

Furthermore, this is an exploratory research into areas of study that are still young and being expanded on. It places emphasis on the ‘why’ and ‘how’ of the test subjects actions, emotions, and attitudes (Drogendijk, 2009). Without a clear idea of what we expect to find, we feel the qualitative method affords us the ability to look more closely at interesting issues that may arise.

3.2 Global Enterprise Experience

The Global Enterprise Experience (GEE) is an international business case competition run by Victoria University of Wellington, New Zealand, and supported by UNESCO and the
United Nations Development Program. The aim is for participants to develop the skills required to build a successful business venture, and manage teamwork across multi-cultural and multi-geographical boundaries. Participants enroll from around the globe singularly, or in pairs, and are assigned to a team of 8 members. All teams are assigned team leaders from the contestants who come from either New Zealand or Australia. They are given a few weeks to form a business proposal based on a theme, which is then assessed on concept, marketing, economics, implementation, and presentation. Each participant also submits a 1 page personal journal in conclusion of their experience (GeeBiz, 2013).

We shall be analyzing data collected ex post from participants in the 2013 GEE Competition. The assigned topic for the 2013 competition was “to develop a business concept proposal for a profitable product or service that addresses one of the Millennium Goals of the UNDP (GeeBiz, 2013). These goals are described below:

<table>
<thead>
<tr>
<th>Eradicate extreme poverty and hunger</th>
<th>Improve maternal health</th>
</tr>
</thead>
<tbody>
<tr>
<td>Achieve universal primary education</td>
<td>Combat HIV/AIDS, malaria, and other diseases</td>
</tr>
<tr>
<td>Promote gender equality and empower women</td>
<td>Ensure environmental sustainability</td>
</tr>
<tr>
<td>Reduce child mortality</td>
<td>Develop a global partnership for development</td>
</tr>
</tbody>
</table>

(UNDP, 2014)

3.3 Sample Selection

Our sample consists of participants from the 2013 GEE competition. It is a clear and obvious case of virtualization, with heavy emphasis placed on a creative but practical and actionable solution. The teams are comprised of individuals from all around the globe, and only become acquainted for this project (unless applying as pairs). They must use information technology to bridge the locational, temporal, and relational boundaries they face in addition to performing the task asked of them. All of these components are of vital importance to us and allows us to investigate the changes in the creative process through team virtualization.
It should be noted that pairs can apply, and regulations stipulate that the maximum number of pairs per team is 1. Owing to this we can say that the lowest percentage of virtualness per team is 75%. This assumes that the pair has an established relationship and is within close physical proximity of each other.

Our sample also consists of participants who have previously expressed an interest in participating in any subsequent studies related to the competition. By this we mean that once the project was completed they added their contact email to a list and agreed to being contacted in the near future for research purposes. Our first step was to contact each participant briefly explaining this study, and requesting their participation. We purposefully did not explain the study in too much detail in an attempt to avoid Confirmation Bias. A copy of the email sent can be found in APPENDIX 8.1.

Out of the 15 candidates we initially contacted, we had a response from 3, one of whom declined to participate. After waiting for one week an additional 11 candidates were contacted for a total of 26, from which we received another 7 responses. Another candidate attempted but was unable to participate due to time and technological conflicts. This left us with a totally number of 8 participants, spread across 4 continents, and 5 time zones. 16 individuals did not respond to our request. The sample spread can be seen in the table below:

<table>
<thead>
<tr>
<th>Interviewee</th>
<th>Continent</th>
<th>Time Difference (From UTC)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Africa</td>
<td>+2</td>
</tr>
<tr>
<td>2</td>
<td>Asia</td>
<td>+5.45</td>
</tr>
<tr>
<td>3</td>
<td>Africa</td>
<td>+2</td>
</tr>
<tr>
<td>4</td>
<td>Africa</td>
<td>+1</td>
</tr>
<tr>
<td>5</td>
<td>Europe</td>
<td>+1</td>
</tr>
<tr>
<td>6</td>
<td>Africa</td>
<td>+1</td>
</tr>
<tr>
<td>7</td>
<td>Asia</td>
<td>+8</td>
</tr>
<tr>
<td>9</td>
<td>Zealandia</td>
<td>+12</td>
</tr>
</tbody>
</table>
In total we had 10 respondents (1 whom declined and 1 who failed to follow through with the interview) for the study, and 16 non-responses. This equates to a 34.61% return on contact. Inconsistent internet access, and lack of network connectivity, in countries that have less developed digital infrastructure is proven to hinder contact (Dube & Pare, 2001), and is a potential reason for sporadic lack of contact. In addition, candidates might be busy with other activities leading them to not reply. Despite this, our sample of 8 was enough to provide meaningful data from in depth semi-structured interviews.

3.4 Data Collection

The effectiveness of an interview depends on interviewer’s ability to communicate effectively and listen attentively, along with the ability to manage the information flow (Clough & Nutbrown, 2007). If conducted properly an interview can supply a broader level of knowledge, where numerical questionnaires fail to capture the nuances of the situation (Cohen, et al., 2007). Our specific interests lie in the creative process within a virtual team, and the virtual team experiences themselves. We have demonstrated in the literature analysis that these areas are far from clear, and there is wide room for interpretation based on circumstance. To fully account for these variations, we (the researchers) have decided to use a semi-structured interview technique. Below is a strength versus weakness analysis of this technique:

<table>
<thead>
<tr>
<th>Strengths</th>
<th>Weaknesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rapport</td>
<td>Bias – Interviewer bias can lead the interview astray.</td>
</tr>
<tr>
<td>High Validity</td>
<td>Reliability – Not every subject will provide the same level of data. Sample size is smaller.</td>
</tr>
<tr>
<td>Clarification</td>
<td>Analysis – Deep levels of data collection bring more irrelevant data along with it.</td>
</tr>
<tr>
<td></td>
<td>Generalization – Unstructured data collection can be harder to generalize, and draw conclusions.</td>
</tr>
</tbody>
</table>

(Saunders, et al., 2009) (Clough & Nutbrown, 2007)
Owing to the geographically dispersed research subjects we cannot conduct face-to-face interviews, and (somewhat ironically) have to resort to virtualization (Sturges & Hanrahan, 2004). After considering this, we only used voice interviews as the reliability and speed of internet connections around the world can impact video conversations. As a result VOIP (voice over internet protocol) was used in the interviews using Skype software which yields a similar experience to a telephone interview. This is a proven valid form of data collection (Saunders, et al., 2009). By using this technique we are able to take unobtrusive notes as well as recording the interview to an MP3 for further analysis. This technique does not allow us to look for visual clues that can potentially cause issues regarding trust between interviewer/interviewee, which can limit the usefulness of the interview (Saunders, et al., 2009). However, we believe that this is less of an issue in our circumstance as each participant has previously volunteered themselves, which implies they are willing to be open about their experiences. Recording the interviews for further study mitigates the problems associated with analysis, generalization, and lack of visual clues. It does this by allowing us to re-analyze interviews to confirm the findings between both researchers. It was anticipated that each interview will take approximately 30-45 minutes, with actual interviews ranging between 20 and 40 minutes.

The outcome of the interviews include notes and interpretations forming semi-structured data. One vital factor to consider when analyzing semi-structured qualitative data is Bias (Flick, 2009). There are two types of bias we have focused on addressing in order to improve the quality of our findings. These are Interview bias and Confirmation bias.

Interview Bias is the process of influencing the response from the interviewee through placing emphasis on certain parts of questioning (verbal and non-verbal) which give subtle or unconscious hints implying the preferred response (Saunders, et al., 2009). To mitigate the risk of this bias we used open questions, and when clarification was needed we offered explanations and examples of possible outcomes.

Confirmation Bias is the process of collecting and analyzing data in such a way that it answers a predisposed tendency in the analyst’s mind, as well as disregarding information that does not fit this predisposed tendency (Devine, et al., 1990). To mitigate the risk of this bias we developed the interview guide in association with a wide note sheet based on key theories and processes. In addition, we recorded each interview...
and both independently reviewed 50% of the recordings. This allowed both interviewees to compare notes and also to ‘troubleshoot’ any bias between ourselves.

It should also be noted that we are making crucial decisions on which data to document and use. It has been shown that when making decisions on key facts, already understanding that there is potential for bias can help to ‘remove one’s self’ from the decision, ensuring an accurate outcome (Bazerman, et al., 2009). We feel this is accurate as we considered biases while forming our interview guide.

The interview guide was formed as a direct result of a distillation of core concepts concerning virtualization and group creative processes. The theoretical review clearly indicated three areas which are key to the creative process, and the potential mitigating effects that virtualization can have. We codified the interview guide into four sections, which include control questions and the three areas of interest. As the virtualization of the creative process is a mitigating factor we chose specifically not to direct questions at virtualization. Instead we chose to push our questions towards creativity, and then expand on their experiences (via semi-structured technique) to find how virtualization affected the process. The interview guide can be found in Appendix 8.2.

3.4.1 Analytical Procedure
To get the most actionable data from our data collection it is important that we follow a well outlined process. This process has been designed to mitigate the weaknesses associated with the qualitative research process. This process is described below:

Interview Collection: The interviews were conducted individually by both researchers. The list of participants was divided in two, allowing for equal spread of interview responsibility among the researchers. Each interview was conducted using the same interview guide and was recorded as an .mp3 audio file. Each interviewer took written notes during the interviews and recorded short summaries of responses to questions as well as any other impressions that may be significant.

Interview Review: The researchers exchanged audio recordings with each other and then proceeded to review the alternative interviews and make notes based on the interviewees’ response in relation to the interview guide.
Collection Review: The researchers provided copies of their notes for one another, so both researchers have complete sets of interview notes. Separately, the researchers compared both sets of notes to identify discrepancies, bias, and confirm reliability.

Result Collation: Having agreed there is no avoidable bias, the results from all interviews are collated based on the interview guide and the three areas of creativity and virtualness discussed earlier. The results are specifically collated this way as the creative process is the focal point with virtualization as the mediator. From here discussions and conclusions are drawn.

3.5 Validity and Reliability
As shown above, there is a specific list of strengths and weaknesses for qualitative study. To increase the credibility of our study we need to build on those strengths and mitigate those weaknesses. This was done by careful consideration of both validity and reliability (Saunders, et al., 2009).

The validity of a qualitative study is not the same as that of a quantitative study. Qualitative validity stems from participant choice and the researchers interview technique (Stenbacka, 2001). The generalizability of findings from qualitative research are limited in comparison due to the specific, in depth, nature of this type of study (Spencer, et al., 2003). By careful and strategic interview technique, coupled with a well-planned question guide, it is possible to produce results that can be applied to a multitude of other areas (Stenbacka, 2001). The interview guide was build using a well thought out framework which is based in generally accepted theories regarding creativity and virtualization. Consequently we believe our results hold validity but are more suited for recommendations of future research rather than generalizations.

The free flowing and unstandardized techniques used in qualitative research often call the reliability of the results into question, especially when results cannot be replicated easily (Spencer, et al., 2003). The interconnection between researcher and results bodes well for exploring themes, but does not when recording consistent data (Stenbacka, 2001). If the researcher is aware of their affinity with the results they collect, and can carefully follow a well-documented and predetermined path, they are less likely to distort the results (Stenbacka, 2001). As previously explained above, we (the
researchers) have a carefully formulated interview guide used through each interview providing a carefully described path of analysis; and we cross-compared our results using an audio recording of the interviews. We believe this minimizes any bias or unreliability that could have occurred during the interview and analysis process.

3.6 LIMITATIONS
A clear limitation for this study is the homogeneity of the Global Enterprise Experience. The volunteer nature of the competition did not give us a chance to study individuals with broader range of motivations for joining, creating sample selection bias. While two interviewees were required by their schools to participate, it is possible that the nature of the GEE competition limited our exposure to those individuals with intrinsic motivations. This limits our ability to study task motivation because of the lack of a real world sample, more accurately mirroring the types of professional virtual teams that organizations use.

There is another likelihood of sample selection bias in our research. All of the interviewees nominated themselves to be part of this study. As a result, it may be the case that they have similar personality types and may be individuals who naturally participate more than others. In direct terms, our interviewees may be among the more dominating members of their respective teams. This could potentially affect the results with regards to team ideation and communication.

Further to this, we had a relatively small sample size. This was predominantly due to the prerequisite acceptance of further communication on the part of the GEE participants, and the number of non-respondents we faced from that already slim list. Although we had hoped for 15 to 20, having only 8 interviews reduces our ability to draw conclusions about the competition, and further reduces our ability to generalize outside of the competition. This is compounded by the virtual audio interviews, via Skype, for the sake of unreliable internet connections. While this may diminish certain biases between interviewee and interviewer, it also diminishes our ability to see non-verbal communication and more thoroughly understand and clarify concepts between parties. As our subjects were limited by the effects of virtual communication, so were we.
Hand in hand with this limitation is the fact we conducted ex post interviews. Our research is based on our sample’s experiences during the 2013 GEE. Our interviews were conducted in 2014, approximately one year after completion of the 2013 GEE. The interviewees’ may have forgotten pertinent information in the one year gap between completion and interview.

It is also important to remember that this is an exploratory study. As there is almost no direct literature regarding this topic we had to make connections where there previously were none. Our aim was to identify the group creative processes most affected by a virtual environment, by cross-comparing relevant theory from areas of virtualization and creativity theory. Our knowledge, opinion, and ability to make these connections is a limitation outright and needs to be considered. The ability to draw such connections without a direct body of literature on the topic restricts our findings to propositions. Rather than try to inform conclusively on the nature of such phenomena, we seek to illuminate opportunities for future research.

3.7 Ethical Considerations

This paper is subject to the same ethical obligations as the rest of the Global Virtual Teams project. All participants interviewed have given full consent to the interview process, and were also notified that they did not have to answer any question should they choose not to. Each participant was also supplied with a separate contact within the wider project with whom they can issue a formal complaint, should they feel aggrieved by the interview.

All data collected from the participants is treated with strict confidentiality. No contact information or personal identifiers are used in the final paper. Each interview recorded is kept secure and not distributed outside of the Global Virtual Teams project. The saved recording is cataloged using a unique identification number which has no connection to the participants personal contact information. To prevent identification from the paper’s content, no direct quotes about unique events were used.
4 RESULTS

The aim of this section is to fully document all of the relevant data collected from the total number of interviews. The data is presented in groupings that mirror the three common themes identified as connections between virtualization and creativity theory. The purpose of this is to clearly identify the issues present in each common theme, which will be developed further in the discussion. For clarity numbers are only used when referring to a specific interviewee. In all other cases throughout the results and discussions sections the numbers will be written out.

4.1 BACKGROUND INFORMATION

Questions to establish background information and motivations for joining the GEE were asked at the outset. We also asked initial questions regarding the extent of virtualness within each team, along with establishing which technology was predominantly used.

Two interviewees had participation in the GEE as a compulsory part of their higher education, while the remainder were motivated by similar themes: an interest in international entrepreneurship or global affairs or personal development. Specifically, those who were not guided by compulsory participation were guided by an intrinsic interest in multicultural experiences, alongside a clearly expressed interest in global affairs.

Furthermore, the majority of interviewees felt that they brought academic experience to their team; with only two interviewees specifying something different. Those citing academic experience consisted of business management-type studies, with two interviewees explaining that they studied entrepreneurship and statistics respectively. Another two interviewees felt that they brought two completely different sets of experience to their teams. Interviewee 3 spoke directly of their experience within social work as a skill set used in the team. Interviewee 5 spoke directly of ‘developing world’ cultural issues and helping the team as a whole to be more aware of the problems facing developing parts of the world.

“We don’t see the same... I made them understand it’s not global, because they think it’s global as that’s the world they live in. It’s not that way.” – Interviewee 5
Two interviewees applied with friends and worked on the same team respectively. The remaining interviewees had no physical contact with any other team members and did not personally know any of their fellow team members prior to the competition. This supports the earlier estimation of 75%+ extent of virtualness per team. Every team used Dropbox as this was the required medium for submitting the final project. Every team also used email as a secondary form of communication. Interestingly, every team used Facebook to one degree or another. All interviewees had the same reasoning behind using Facebook as a primary form of communication; ‘everybody’ uses Facebook on a daily basis, so it was the easiest platform to keep every team member up to date. Other platforms did not have such ubiquity throughout the World and were not easily accessible to some group members. Each team had their own private Facebook group. Additionally, every interviewee developed friendships with between one and three of their fellow team members, most with ongoing contact via Facebook. The utility of Facebook is demonstrated by the following quote:

“Everybody uses Facebook, we check via email first, so we set up a group so we could post things and know when everyone had seen it” – Interview 9

4.2 Task Motivation & Orientation

Every interviewee found the eight topics presented (Millennium Goals) interesting and intellectually stimulating. However, two interviewees were not satisfied with the topic the team decided to pursue, but proceeded with the team to complete the final project anyway. Interviewee 1 specifically refers to team member disagreement regarding their chosen topic. Ultimately their team had to pick a topic facing time pressure.

Three distinct styles of idea formation used are evident from the interviewees’ descriptions. Interviewee 7 described an informal brainstorm approach to ideation, where each team member would document any and all ideas they had in their entirety for the whole group to review. Interviewee 3 described a formalized ideation system, where each team member submitted an idea to the leader. The leader plus two other members decided the best two, upon which the rest of the team would vote for their preferred course of action. Interviewee 2 described a similar system, where three ideas per member were graded based on a predetermined criteria. The remaining
interviewees all described a semi-formal process of ideation, where each member would present their ideas to the rest of the team and they would vote on the preferred course of action. These three styles of ideation are illustrated by the quotes below:

“We just brainstormed everything, to get it together, and together we picked (the topic) as a team” – Interviewee 7

“(The leader) directed that we come up with 3 ideas ourselves, and rate each idea on the criteria that (the leader) made” – Interviewee 2

“Everybody gave their ideas individually, eventually we agreed that (the idea) was the best explained, looking at the specific objectives” – Interviewee 4

The majority of interviewees explained that their teams took between three days to a week to progress from no idea to chosen course of action. The only exception was Interviewee 3 (formalized ideation system) who faced a two week ideation period in their team. All interviewees, aside from interviewee 1, felt that they generated enough ideas to choose from during the ideation process; three interviewees even said there were too many. Interviewee 1 expressed dissatisfaction with the quantity and quality of ideas generated and would have preferred more to choose from.

It is evident from the interviewees’ responses that there was no common behavior in terms of task orientation. All interviewees described different experiences as a team with regards to goal setting, shared vision, and effective development of ideas through constructive debate. Interviewee 1 found goal setting too mechanical, and assigned directly by the leader. Interviewee 5 had a similar team dynamic, specifically commenting that the team was ‘not a democracy’. Interviewee 3 recalled there were no set goals or shared vision until the final week. Interestingly, Interviewee 7 described a team environment with a strong leader figure dictating strict goals and a plan of action, specifically referring to the success of finding consensus quickly and not facing any discord as described by the other interviewees facing ‘dictator’ leadership styles. The remaining interviewees described situations of varying task specificity and goal setting which appear to fall along a scale between interviewee 7 and interviewee 3’s experiences.
“A team leader who imposed themselves, at some point the leader would say ‘that’s the decision’. Like in a family, it was not democratic” – Interviewee 5

Interviewees 1 and 3 found there to be very limited constructive debate within the team, describing a situation where members were not willing to develop issues associated with their topic. Interviewee 1 went further, explaining that their leader would take executive decisions without allowing debate among members. Interviewee 5 found that the team automatically fell into a logical system, where a member would build a pros and cons list before bringing an idea to the group. The remaining interviewees all felt their teams had constructive debate regarding key issues and were receptive to new or challenging ideas.

4.3 Social Environment & Participation

All interviewees, except interviewee 9, did not finish the project with a fully intact eight member team. This was due to both non-participants and under-performers. The non-participants were team members who applied for the GEE but did not start when required. Interviewees 1, 5, and 7 had members expelled from their team due to under-performance, which was described as not meeting deadlines and very poor quality of work. Interviewee 1 went further and explained that only four to six of the initial eight members actually contributed to the final project. Interviewee 5 found that two team members were not really able to contribute due to a lack of understanding and an apparent lack of interest in understanding, which lead them to be mostly ostracized from the team work process. It is clear from all interviews that performance was the key determining factor in the suitability of a team member being accepted.

“All the group members were removed... we were eight, and three or four of the team members were not contributing so they had to be removed” – Interviewee 1

All interviewees felt their team’s social environment was receptive to sharing opinions and evaluating member input fairly during the final stages of the project. It was evident from the interviews that this was a result of equilibrium forming within the groups, and is separate from the ideation process. However, Interviewee 1, 3, and 9 found their teams were not able to manage any new or challenging ideas that arose after the ideation process was complete. Interviewee 1 claimed that new ideas were actively
discouraged and interviewee 3 found that if a new idea was proposed the team would temporarily lose faith in their current plan of action (effectively second guessing themselves). Interviewee 2 described an environment where discussion was great, but once a decision had been made they would move on. Their leader refused new ideas after the fact.

"The teammates were very open, one suggested a different idea… the leader didn’t allow it” – Interviewee 2

“If (a team member) had a particular skill or expertise that would assist with the challenge… whatever it was we would listen…. We all came from different backgrounds and used that to address (the topic)” – Interviewee 3

An important point to note is the difficulty in understanding a team member’s social context using asynchronous communication. Interviewee 5 went into extended detail about the difficulty of communicating purely via typed messages. They commented that it was very hard for a reader to grasp the tone of a typed message, which caused friction and mild misunderstandings between team members. The misunderstandings were seen as a direct result of cultural and gender differences being expressed in a clinical way. Interviewee 5 found that various team members were not familiar with other cultures, or working with women, and by typing responses these differences are left to the reader to interpret. Interviewee 5 freely admitted that the first stages of communication were fraught with misunderstandings due to this.

“You don’t see the person, it’s all about getting the job done…. When you meet somebody you know their differences, we are not from the same culture, and virtually the thoughts on how people should be treated cannot be seen right away…. They took time to find out” – Interviewee 5

4.4 COMMUNICATION
Every interviewee found the difference in time zones and the variety in internet access to be a major limiting factor for team communication and coordinating efforts. All the interviewees also experienced lower task motivation and decreased ability to innovate due to this delay. They described non-real-time communication as clinical, with little to no personality expressed while presenting or commenting on ideas. Despite this, all
interviewees felt that themselves’ and fellow team members were mostly understanding of their role in the group. This was after the ideation process, and after initial role assignments had been made. 30% of the interviewees described a situation where a few team members were unsure of their roles after ideation, but this was quickly addressed through communication.

Most interviewee’s teams did not use real-time communication, but interviewees 3, 4, and 6 did use real-time communication. By this we mean that they did not use VOIP tools or telephones to actually talk to one another. Interviewee 9 did note that smaller portions of the team would occasionally engage in real-time communication, often by telephone, including herself and another New Zealander on the team who was co-leading the group. She did point out that these talks were mostly social in nature as they were aware that the rest of the group was being excluded. They all cited time zone difference, busy lives, and inconsistent internet connections as their justification for this decision. Interestingly, when asked what they felt was the major difference between this project and other face-to-face teamwork they have previous participated in, they all gave the same reasons. They felt the big differences between face-to-face and virtual teamwork were the pressure resulting from time zone differences and inconsistent internet access.

“(I have) poor network access which stops sometimes, that made it more of a challenge…to communicate quickly with my team” – Interviewee 8

“Some of my team mates don’t have good internet access, it is a challenge for us…it creates delay for us, sometimes we cannot give valuable feedback where needed, it affects our drive as a team. It affects the drive and makes us lazy” – Interviewee 2

Interviewee 3 described the heaviest use of real-time communication. Their team used real-time video communication (Google Hangouts) for every major decision that needed to be made. This allowed them to clearly explain and understand each idea, as well as speed up almost every aspect of communication within the team. Interviewee 3 found that talking to fellow teammates via webcam allowed for a person’s emotions to show, which stimulated the overall creativity and innovativeness of the group by ‘bouncing’ ideas from one another conversationally.
“When people started to really explain their ideas (using real-time)... it felt a lot more genuine, the fact that emotions went into what we were saying. Before, they were just posted, just words, they felt more vague” – Interviewee 3

Further to this, and very importantly, interviewee 3 found there to be almost no difference in face-to-face teamwork versus virtual teamwork using real-time video communication. His explanation for this was that face-to-face allows for the reading of peoples expressions and feelings during a discussion, which greatly improves the speed and accuracy of team member understanding. While video communication does not provide a complete substitute for face-to-face interaction, interviewee 3 did find it to be a more than suitable substitute. He noted that the use of real-time communication created a sense of excitement within the team and increased task motivation, according to the interviewee.

“IT's exponentially better (than typing), it made us all proud to be producing this amazing document” – Interviewee 3

4.5 ADDITIONAL POINT OF NOTE
An interesting point has emerged during the interview process which we believe is worth mentioning, especially related to virtual communication. All of our interviews were conducted using VOIP (voice over internet protocol), in the form of Skype without video. We had difficulty maintaining a conversation with 4 interviewees as a direct result of inconsistent internet access on their side. This meant that 4 interviews randomly disconnected mid-sentence, requiring us to retry the call. As a direct result we, the interviewers, faced increased pressure to glean as much information as possible in between disconnections, and having to reestablish the flow of the conversation once a call was reconnected. We feel that this somewhat stunted the information flow temporarily reducing the effectiveness of the call, as well as increasing the time taken per interview. It should be noted that this did not happen with interviewee 3, as they had a strong internet connection.
5 DISCUSSION

The aim of this section is to analyze the data described in the Results chapter through relevant theoretical perspectives. The purpose of this is to see if the theoretical connections between virtualization and creativity have any actual manifestations or practical realities. Further to this, we will see if there are any persistent issues in all three common themes.

5.1 TASK MOTIVATION AND TASK ORIENTATION

In relation to current work on both creativity and virtualization, we identified the first key point of intersection as task motivation and task orientation. This common theme highlights an individual’s intrinsic motivation for participating in the group project, as well as their orientation to the task. Questions about individual satisfaction, while not strictly relevant in this study, do establish a cross section of motivational mentality within teams. Two interviewees reported being required to join the competition as part of a course, but still reported interest in the topics presented as well as satisfaction with the particular project the group chose to pursue. All the other interviewees entered out of their own desire to participate. Only one interviewee was unsatisfied with the project their group settled on, but this seemed more related to infighting and time pressure than to the subject matter itself. This demonstrates that some level of intrinsic motivation was present among all interviewees even though the competition was compulsory for two of them.

The degree to which intrinsic motivation played a role was far too difficult to establish in this research because of the volunteer nature of the competition, plus the degree of motivation goes beyond the scope of this study. However, this does tell us that intrinsic motivation, a key driver for the creative process (Runco, 2006; Amabile, 1996), was present within the teams at the point of inception.

Task orientation is more specifically concerned with the presence of constructive debate in which perspectives are challenged and ideas are exchanged to increase the level of rigor and quality in the ideas generated (West & Anderson, 1996). Related to task orientation is proper goal setting and clarity of objectives. These help keep the team focused thereby facilitating task orientation. Weingart’s planning phase specifically refers to the importance of goal setting and strategy in forming a shared
vision and direction (Huang, et al., 2002). The clarity of objectives has one of the most established links to the successful development of new ideas (West & Anderson, 1996). Four interviewees expressed that goals were successfully set early on. Interviewees 5 and 7 mentioned the presence of a strong and authoritative leader who appeared to dictate goals rather than discuss them within the group. Interviewee 9, however, was a group leader herself and it is difficult to know the extent of her authoritativeness directly from her as bias could play a role in her answers.

These interviewees also reported the presence of constructive group discussion and all but interviewee 5 reported that they came to a decision on which idea to choose quite rapidly. It should be noted, however, that interviewee 5 mentioned that the group originally perceived that they had come to a decision quickly until later when they realized time was running short. This same interviewee also mentioned that while there was good discussion the format was quite strict requiring all members to pitch their ideas to the leader which stifled creativity. Virtualization theory claims the greater degree of virtualization equates to lower social interaction, more evenly distributed member participation, and increased time before communication becomes effective (Martins, et al., 2004). The experiences of interviewee 5, along with the other interviewees, clearly demonstrate this to be the case.

Interviewee 5 explained that while there were sufficient ideas generated, the pitch method limited transparency and exchange of ideas. Contrast that with interviewees 1, 2, and 3, whose groups did not set clear goals early on and faced time constraints later in the process, coinciding with virtual team theory and the goal setting process. Interviewee 2 did mention that there was satisfaction, almost overwhelmingly, with the number of ideas generated but lamented not having stronger leadership to take action faster. This was particularly curious based on their team’s regimented ideation process. There was no further information available regarding why there was an apparent lack of direction from the outset, but it does pay lip-service to the importance of developing a shared vision hand in hand with goal setting. In an alternate approach to the ideation phase, interviewee 7, faced the inverse of this problem. Their brainstorming method of idea generation produced an avalanche of results, but once the ideation period was complete there was a lack of direction due to a lack of goals. The state of engagement
in the task was particularly high during the brainstorm ideation, and based on the interview we can comfortably say that this did bring the group into focus and create desire to innovatively solve the problem (West, 2002). The lack of goals was due to asynchronous communication, and was later rectified (should not be considered a lack of team direction/strategy). However, the moment of 'confusion' took valuable time from the task and increased conflict temporarily as a result. This thought is supported by interviewee 2, who found delays caused by lack of direction to reduce motivation levels within the team, thus lowering the team’s task orientation and focus.

Q1 - How is task motivation and orientation influenced by virtualization?

While we could not draw direct conclusions about motivation, it appears that task orientation has a relationship to the speed with which ideas are generated as well as the quantity of ideas generated. Further to this, it appears that task motivation and orientation are directly affected by the forward momentum present in the virtual team (in the form of targets and goal setting). Delays of this nature may be due, at least in part, to asynchronous communication (discussed in further detail later). Overall no direct trends arose to suggest virtualization influences task motivation and task orientation, but it is apparent that asynchronous virtualization affects the team’s ability to communicate. This indirectly causes problems for the team environment.

5.2 Social Environment and Participation

In relation to current work on both creativity and virtualization, we identified the second key point of intersection as social environment and participation. This common theme highlights the contributions and debate within the team. When it came to contribution to the team it appeared there were several cases where individuals needed to be removed or removed themselves. Five interviewees reported team members leaving the group after choosing not to participate. Interviewee 3 reported that one member withdrew for personal reasons but this same individual had been experiencing a great deal of technical issues and could not participate very actively. The fact that a member recused themselves based on technical issues goes a long way to describe the logistical problems that can (and did) plague virtual teams. Interviewee 5 reported that their team leader stopped participating or communicating close to the deadline of the
project, which had a temporary effect of confusion and lack of direction. This is precisely like the effect a lack of goal setting has on task orientation. It was only when the interviewee stepped up to lead that the team got back on track.

The other three groups expelled members for poor performance, suggesting that the lack of a strong social environment may have placed emphasis on performance alone, and caused a drop in some individual’s motivation. This, in turn, may have caused more members to be expelled from teams than might have otherwise been the case. Virtual team theory suggests that fellow team members lose faith in underperformers at a drastically faster rate than in face-to-face teams. Essentially, if a member fails to deliver they never really recover after the fact (Martins, et al., 2004). It also shows an interesting juxtaposition of both a supportive and punitive group environment, both of which are opposite ends of the spectrum with regards to West & Anderson’s ‘support for innovation’ group process (West & Anderson, 1996).

It is not possible to tell from this research whether the highly varied participation and contribution is directly related to the virtualness of the team or some other factor such as lack of motivation.

Somewhat counter intuitively, all interviewees noted a social environment in which they could freely share ideas. The research suggests that once the ‘problem’ team members had been removed from the equation there was a much more productive team environment formed. This is evident in the bilateral feeling that interviewees had both a good environment to share opinions and evaluate member input fairly. This is a positive for the group creative process from the interactionist point of view: a creative social environment requires a back and forth between an individual and the group (Woodman, et al., 1993). However, we can call this into question when considering a team’s ability to cope with a new challenging idea.

Information from four interviews found that new challenges to established ideas would disrupt workflow and were actively discouraged. This, and the removal of underperformers, raises questions as to West and Anderson’s perspectives on support for innovation. Essentially, these interviewees faced an environment which did not ‘support innovation’, theoretically speaking. This is a curious point to observe, as the teams did
not report an anti-innovative environment after the fact. However, interviewee 3 did note that she held back her ideas in some cases simply to save time as they were facing deadline issues. Only one interviewee felt their opinion could have been taken further into consideration, but was still content with the overall experience. Two others were rather ambivalent with one stating that their group was ‘mostly’ receptive and another stating that there were very few challenging ideas at all. The fact that all interviewees reported similarly about how safe they felt sharing ideas within their respective groups, while their view of how conflict was handled in their groups varied considerably, suggests that there may have been a disconnect between how secure they felt about sharing their own ideas and how they perceived the group environment with regards to challenging ideas.

Interestingly, there is evidence that shows that virtualization removes social cues and anxieties that come with face-to-face teams. It can also diminish the difficulty of sharing ideas resulting from only one person being able to hold the ‘floor’ at any given time while others listen (Baruah & Paulus, 2009). It could be that the entire virtual environment makes individuals feel more relaxed about sharing, and the ease of posting an idea to Facebook (which was used ubiquitously) allows for individuals to freely post ideas as they come to them. Here we face yet another collision of opposing thoughts. Current understanding shows that the platform used to virtualize a team is more effective if the team members are familiar with it, but current understanding also suggests that removing social cues lowers the effectiveness of team communication (Martins, et al., 2004).

We can anecdotally confirm that every team used Facebook as a result of familiarity with the platform. We can also anecdotally confirm communication issues by removing social cues. While every interviewee stressed their comfort with expressing themselves via typing, interviewee 5 exposed the shortcomings of the mode. Typing a message provides content without context, and it is down to the reader to interpret the message behind the words. In this case, cultural differences regarding how people of different genders and ages refer to each other were typed without context. This caused a substantial level of inter team conflict, and disrupted the team’s performance until the issues were resolved. This lends credence to the synergy approach to creativity. Team
creativity is the interplay between its members creating a better result than if they worked separately (Baruah & Paulus, 2009). Here we found initial success in group creative synergy, which collapsed once that synergy was broken. From the perspective of interviewee 5, the same level of creativity never returned due to the delay in communication addressing the personal factors relating to the misunderstanding.

Q2 - How is team participation and social interaction influenced by virtualization?

We can see a pattern begin to emerge regarding the impact of virtualization on team participation. Team participation appears to be based on the individual’s performance and contribution to the end goal. If a member fails then they are removed, or ostracized from the rest of the team. This pattern is in line with Weingart’s interpersonal process, where underperformers are judged quickly and harshly. There is also a trend evident in social interaction (or lack thereof). Asynchronous virtualization puts a strain on most aspects of social interaction through incorrect interpretations of communication, and the simple delay in said communication. While this is interesting, we found rather varying results regarding how this influences the creative environment. We cannot draw any firm conclusions.

5.3 COMMUNICATION

This common theme highlights the ability of members to communicate effectively, and the technical factors of working as a team. The clearest example of the influence virtualization has on a team emerged when directly asking interviewees about efforts to communicate with their group members. In fact, all of our interviews have both implicit and explicit references to inter-member communication as the driver behind the majority of issues they faced. Every interviewee cited either time-zone difference, delayed responses, or access to internet as a major problem with communication. Furthermore, most of our interviewees were living in areas where internet access was not reliable and cited problems other group members had had as well. The impact of communication problems spans both virtualization theory and creative theory; where communication is a key factor in Weingart’s action process (Martins, et al., 2004), creative interactionism (Woodman, et al., 1993), creative synergy (Baruah & Paulus, 2009), and other theoretical approaches. Considering communication as a key factor in
both virtual teams and creativity, it is hardly surprising that the interviewees described a number of other problems all interconnected by breakdowns in communication.

Asynchronicity was always linked to extended communication time as group members had to wait for individuals outside of their time zones to read and respond to communications. Interviewee 7 cited that they did not consider real-time communication because of asynchronicity, and interviewee 2 specifically commented on a drop in motivation and ideation due to delays caused by time zone differences. Blackburn, et al. specifically note that time zone differentiation can have a detrimental effect on forming shared goals and the drive of the group, which is exactly what we found. The lag in communication creates tedium and can cause fatigue among group members (Blackburn, et al., 2003).

While the effects of asynchronicity on groups are known, it may also have a specific effect on creativity. Individuals do not get the same type of feedback they may receive in a face-to-face team. According to both the sense-making and interactionist perspectives, individuals need cues from the world around them (Woodman, et al., 1993) to understand how to deal with a problem (Drazin, et al., 1999). Individuals need to share ideas from memory with other group members who then process and respond to those ideas (Baruah & Paulus, 2009). It stands to reason that barriers to that process would reduce the effectiveness of the group to generate ideas, and may also explain the incredibly strict methods some leaders took in several of the groups which simply discounted challenging voices.

This is further supported by the fact that all interviewees expressed a preference for face-to-face teams over virtual teams due to the lack of face-to-face communication and the lag in communication time. Interviewee 5, whose team did not engage in real-time communication, noted the loss of social interaction as removing a ‘personable element’ from the team. She mentioned that working in a virtual atmosphere was fine but not ideal. Interviewee 6 also responded that Skype assisted with ideation and lamented the lack of body language cues that can be perceived in a face-to-face team.
5.3.1 The Importance of Real-time Communication
The strongest trend that has emerged is the importance of real-time communication to stimulate group creativity. Interviewee 3 described a team environment where they used real-time communication for all decisions and discussions, adding that he did not perceive any significant difference between virtual and face-to-face teams.

His team used real-time chat, Google Docs and Google Hangouts rather than Skype, extensively and noted that issues were sorted out much faster. In real-time there was a ‘flow’ to the communication which appears to have removed motivational and social issues faced by the other teams. It was also noted that the mood of an individual could affect said individuals ability to be creative, which could not be perceived without real-time face-to-face communication. Another two interviewees (4 and 6) marginally used real-time communication due to internet connection issues. They noted that the ‘flow’ was disrupted when team members posted ideas and responded to posts on platforms like Facebook, providing evidence that asynchronous and inconsistent communication is a cause of many problems in virtual teams.

Furthermore, interviewee 3 stated that real-time communication assisted in idea generation because people could communicate more clearly and elaborate on their thoughts. This elaboration from others helped stimulate idea generation within the interviewee, a perfect example of Baruah & Paulus’ synergistic effect. The process of exchanging ideas directly stimulates increased ideation which would not have occurred were the individual acting alone. It was also mentioned that using video chatting allowed for emotion to be transmitted, which was viewed as important and showed a keen awareness of the social nature of group work.

Q3 - How does virtualization influence team communication?
It is clear to us that virtualization can heavily influence team communication, depending the type of virtualization platform used. The single factor that stood out the most was whether or not teams engaged in real-time video chat or not. Non-real-time virtual platforms do not overcome the locational and temporal boundaries effectively enough to mitigate the problems caused. Real-time video communication appears to, at least partially, overcome these boundaries. In our minds this is a strong conclusion to draw.
Additionally, all three interviewees had positive, if not glowing, comments about the effect of real-time communication on idea generation. A testament to this is interviewee 3, who went so far as to say there was no real perceived difference between face-to-face and virtual teams. This is a stark difference to other interviewees; and a clear point of intersection where a virtual environment directly influences the group creative process.
6 Conclusion

The aim of this section is to draw on the information from all three common themes to propose an answer for the wider research question regarding the influence of virtualization on the team creative process. The purpose of this is to provide an exploratory bridge between two concepts that have not yet been investigated together, in the hope that this can be used for future research into this phenomenon.

6.1 Conclusion

The aim of this study was to investigate how the group creative process functions in a virtual team environment, and to try and identify key areas for future research in the field of team virtualization. We began by reviewing current theory and drawing connections where there was common ground to provide a bedrock understanding of the factors at play. This was done in the formation of the three common themes used throughout this paper. From there we conducted interviews and analysis to answer our overriding research question:

How does the group creative process function in a virtual team environment?

Our research suggests that virtualization affects how the group creative process functions depending on the type of virtual communications platform used.

Virtualization has varying levels of influence on the group creative process by changing how group members communicate and interact with one another. Our findings indicate that most non-technical difficulties arose as a direct result of non-real-time communication being used between team members. These disruptions in communication clearly influenced the social environment and participation, and anecdotally seemed to influence task motivation and task orientation. As social interaction is dependent on communication it is natural that disruptions in communication were influential factors in the group creative processes. This is not a conclusive result due to the non-specific nature of the negative influence in relation to general teamwork, rather than just the creative process.

This is inversely supported by the overwhelmingly positive response from teams utilizing real-time communication. The data indicates much lower rates of discontent in all
aspects of the group creative process when group members are able to see each other’s faces and hear each other’s voices as they communicate. Using real-time video chat can greatly reduce the disruptions caused by asynchronicity and non-real-time IT platforms such as email or social media. Interviewees were much more easily able to ‘bounce’ ideas between group members which has been shown to stimulate further idea generation (Baruah & Paulus, 2009; Zhou & Shalley, 2003). Furthermore, the mention by some interviewees of tacit concepts such as being able to read emotions and body language suggest that other key social factors are at play that may influence creativity.

From this we can draw a reasonable conclusion that real-time communication is a key factor of the group creative process in a virtual environment. This is not a definitive conclusion due to the limitations of this study, but is strongly recommended for future research into the creative functions of a virtual team.

However, given the nature of this research we cannot draw any other conclusions regarding which other aspects of the group creative process are influenced by virtualization. The results and analysis performed demonstrated a split in our understanding of how virtualization affects all functions of teamwork, not just creativity. Any issues present with task orientation and social interaction were overshadowed by the wider problems with communication and muddled by the possibility of other factors, such as personality and culture, playing a role. A perfect example of this influence is the anecdotal impact of asynchronous communication on task motivation and orientation. It is likely that this impact would occur in a virtual team regardless of the type of task being accomplished.

The fact that interviewees using real-time communication did not report the same communication problems and concurrently mentioned the creative advantages made possible by simulated face-to-face contact strongly suggests a lack of face-to-face communication is the most prevalent factor in virtual communication; this link, however, is purely hypothetical and requires further study.

6.1.1 Theoretical Implications

The theoretical implications for our work are evident in the way virtualization has influenced the group as a whole, as well as the group creative process. The prevalence of communication problems imply that there are different levels of influence affected
on a team via virtualization. The way that group creativity is dependent on a social interaction presents an obvious connection between being able to communicate effectively and being able to engage in the group creative process. Any problems within the communication process will affect the group creative process. As understanding of creative processes continues to increase, it may become more evident what specific areas are most likely to be affected and how. Thus far we have seen that disruptions to communication and coordination can affect the social environment and may have further impact on task motivation and task orientation. But how exactly the social environment is effected is quite unknown. Being social consists of more than just a back and forth of words and some theorists (Wheelan, et al., 2003) have found that non-task related socializing is a part of group development. There are other aspects at play that have an impact on idea generation that may be affected by virtualization in other ways. The nature of the interplay between virtualization and the various ways in which individuals socialize (tacit and overt) needs to be studied in greater detail.

Furthermore, there is reason to believe that both task motivation and task orientation are also affected by virtualization. Task orientation is easily a part of group social behavior so its connection is more obvious. The connection to task motivation, however, is more difficult to verify. Amabile describes intrinsic motivation as coming from within the individual. It is one of her three components of creativity and therefore crucial in the process. It is unclear, however, whether or not this can be impacted, directly or indirectly, by virtualization, and to what degree. This is another area where further research is necessary to understand the specific interplay at work.

Further to this, there appeared to be problems caused by lack of team direction and miscommunication due to cultural differences or other possible variables. As previously stated, Weingart’s interpersonal process was not directly investigated in this study due to the need to narrow the focus of the research. Regardless, some anecdotal evidence has emerged implying problems caused by lack of socio-cultural understanding and trust. The limited information suggests that some initial miscommunications causing conflict were resolved and the teams had direction, but there were still issues based on personal factors. The implied connection is that while major problems are solved with
effective communication and task orientation, other interpersonal processes that we have not noted here may still be at play. Theoretically speaking, these issues could also be mitigated by using real-time video communication. Further research is still necessary to see how virtualization affects factors such as gender and cross-cultural communication.

One interesting factor is the similarity between Weingart’s planning processes and West & Anderson’s objective setting process. Both of these center around the group forming a shared vision for the team and the team goal. Teams that set out clear objectives tended to be more efficient with time management and efficiency. It was not, however, evident whether there was a connection between idea generation and goal setting. In some cases it did appear that effective goal setting could increase task orientation which would in turn affect ideation. This is another interesting area for future virtual team research to investigate.

6.1.2 Practical Implications

Having demonstrated that real-time video communication can help overcome locational and temporal boundaries in a much more effective way than delayed communication platforms such as email or Facebook groups, organizations may focus their efforts on using such platforms in their formalized groups and experimenting more heavily with their use. This is based on a team operating at 75%+ extent of virtualness. It is reasonable to assume that if a team is operating at a lower extent of virtualness they will be better placed to deal with objections and issues arising within the group, much in the same way as real-time communication was seen doing in this study.

With this in mind, we believe that the importance of effective virtual communication is increased as the extent of virtualness increases. We believe this based on the success of real-time communication in mitigating the disruptive impact of virtualization, assuming that lower extent of virtualness equates to increased face-to-face team contact. If a manager is designing a team with a high extent of virtualness then extra precautions need to be put in place to ensure real-time communication is used as the primary form of communication, especially if that team’s primary tasks are creative in nature.

While the results are compelling, the entire experience was educational and voluntary. They cannot be directly transferred into an organizational context due to the
compulsory and results driven nature of most formal virtual enterprise teams. Also, the GEE case competition was concluded in a short time span. It is unlikely in an enterprise setting, that high priority targets would be pursued with almost completely virtual teams comprised of members whom have never met each other working in such a short timeframe. Without further research it is difficult to tell how much impact this contextual difference has on team creativity.
7 Works Cited


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8 APPENDIX

8.1 CONTACT EMAIL

Dear X,

You have received this email because you participated in the 2013 Global Enterprise Experience (www.geebiz.org) organized by TeKaihau in collaboration with Victoria University of Wellington and a number of other universities around the World.

We are two master students studying at Uppsala University in Sweden. We are writing our thesis as part of a larger research program on ‘Creativity and Learning in Global Virtual Teams’ organized by Professor Lena Zander at Uppsala University, Peter Zettning, a Senior Research Fellow at Turku School of Economics in Finland, and Associate Professor Audra Mockaitis of Monash University in Australia.

We would like to interview you via Skype about your experience in the GEE program in regards to creativity and your experience within the team. Please note that your personal identity will not be reported in our thesis.

We hope you will be willing to participate in our thesis and we thank you for your time.

Sincerely,

Terry Maher and Tim Edmonds
8.2 Semi-Structured Interview Guide

General Questions

- What were your motivations for joining the competition?
- What did you bring to the team in terms of past professional and academic experience?
- Did you ever physically meet any of your teammates?
- Did you develop any friendships from your team, and are you still in contact?
- Which three pieces of technology did you use the most for this task?

Task Motivation and Task Orientation

- Did you find the topics presented interesting? Were you satisfied with the topic your group chose to focus on?
- To what extent were specific goals or objectives set within the group early on during the assignment?
- Did you feel there was constructive debate or conversation involving opposing views within the group?
- What was the process for selecting an idea?
- How quickly did you settle on an idea?
- Did you feel the group generated enough ideas to choose from?

Social Environment and Participation

- Was everybody able to contribute equally to the project?
- Did you feel you were able to freely share your ideas and opinions?
- Did you feel your ideas were listened to and fairly evaluated?
- Was the group receptive to new or challenging ideas?
Communication and Coordination

- What sorts of challenges did you face when sharing ideas with other group members?

- How would you compare your experience in a virtual team to your experience in a face-to-face team?

- Did you engage in any real-time discussions (i.e. Skype conference calling or a group chat platform) and how effective did you find those discussions when it came to generating quality and/or quantity of ideas?

- Was everyone clear about their role in the group?

- Was there a formalized leader within the group?

May we use the journal you submitted for further analysis of your experience?

- See how technology influenced the three dynamic group processes in relation to our creativity questions.

- Use the technology factor as follow on developing questions.