Group development in virtual teams: An experimental reexamination

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ABSTRACT

Virtual teams are thought to be experienced differently and to have poor outcomes because there is little or no face-to-face interaction and a tendency for virtual team members to use different communication techniques for forming relationships. However, the expanding use of virtual teams in organizations suggests that virtual teams in real world contexts are able to overcome these barriers and be experienced in much the same way as face-to-face teams. This paper reports the result of an experiment in which virtual teams participated in an exercise where they completed an information-sharing task ten times as a team. The results suggest that, contrary to one-shot, ad hoc virtual teams, longer-lived virtual teams follow a sequential group development process. Virtual team development appears to differ from face-to-face teams because the use of computer-mediated communication heightens pressure to conform when a virtual team is first formed, meaning trust is most strongly linked with feeling that the team was accomplishing the task appropriately. As the virtual teams developed, trust in peers was more strongly linked with goal commitment. Once the teams were working together effectively, accomplishing the task appropriately was the strongest link with trust in peers. I suggest that virtual team managers should cultivate virtual workspaces that are similar to those proven to work in face-to-face contexts: (1) teams should have clear, specific goals, (2) members should be encouraged or even required to communicate with each other, and (3) team members should feel that they might work with the other team members again.

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1. Introduction

Virtual teams are an organizational form in which an overlay of information and communication technologies (ICT) enables departures from traditional, face-to-face, organizational forms. The ICT can consist of e-mail, telephony, instant messaging, and, in more sophisticated forms, videoconferencing, shared workspaces, and group decision support systems. The ICT facilitates geographic dispersal of team members and potentially allows for extensive blurring of team boundaries. It does this by allowing leaders to bring in new members, have them perform a needed task, and have them exit with little loss of resources (Mowshowitz, 1997). The use of ICT and blurring of boundaries is believed to make traditional methods of social control such as direct supervision, geographic proximity, and similarity in background less salient (Greenberg, Ashton-James, & Ashkanasy, 2007).

Working together effectively would therefore be particularly difficult for virtual teams because there is little or no face-to-face interaction with which to form relationships (Jarvenpaa, Knoll, & Leidner, 1998). Because members of virtual teams have fewer tools available for developing relationships than face-to-face teams, they must rely on categorization processes (McKnight, Cummings, & Chervany, 1998) and their experience from other settings (Jarvenpaa & Leidner, 1999). Furthermore, because they interact via computer-mediated communication (CMC), virtual teams must take more time and/or use different techniques to develop relationships (Walther, 1992). An example of an altered technique is when team members expose more about themselves via CMC than they would when face-to-face, or becoming "hyperpersonal" (Walther, 1996).

In spite of all of the potential problems with virtual teams, their use continues to expand. Thus, either the benefits to organizations that are using virtual teams outweigh these costs, or the hardships experienced in virtual teams have been overstated by academic researchers. The purpose of this paper is illuminate key perceptions of virtual team members that enable their team to reach the point where they are able to work together effectively. I frame this study using the group development model and focus specifically on the emergence of feelings of belonging, commitment, and trust, and how those influence team performance and satisfaction with the team. The teams completed a simple, structured task over and over so I could observe group development in a controlled setting during a relatively short period of time.

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2. Theoretical background

In face-to-face contexts, a group that needs to make a decision, complete a project, or any other task has two objectives: structuring itself and completing the task (Guetzkow & Simon, 1955). When a group is formed, its members bring resources (information, expertise, physical and cognitive abilities, etc.) with them that can be used to complete the task (Goffman, 1961). Since productivity depends on how well a group is structured to use available resources (Steiner, 1972), an important element in a virtual team's productivity is its ability to develop (i.e., get organized).

2.1. Group development in co-located contexts

In co-located contexts, researchers call the set of processes that prepares a group for work "group development." The overall process of group development includes the creation of sub-structures used to accomplish group development tasks (e.g., determining that "majority rules" when making group decisions). When groups first meet, they rely on member attributes to allocate roles. As they continue to interact, further development relies on attributes that are learned from observations of role performance (Goffman, 1961). If role behavior is consistent with expectations, trust develops rapidly (Meyerson, Weick, & Kramer, 1996), otherwise conflict occurs (Wheelan, 1994). Group development in face-to-face teams has been modeled as occurring in five stages (Tuckman & Jensen, 1977; Wheelan, 1994). These stages represent the evolution of groups and are shown in Fig. 1. The first three stages; dependency and inclusion (a.k.a. forming), counterdependency and fight (a.k.a. storming), and trust and structure (a.k.a. norming), are the activities that prepare the group for work. These are characterized by different development tasks that are accomplished. The work (a.k.a. performing) stage indicates the time when the group is working effectively, and the termination (a.k.a. adjourning) stage is the time when the group assesses its performance.

The earliest stage of group development, *dependency and inclusion*, is characterized by member anxiety (Tuckman & Jensen, 1977; Wheelan, 1994). This is because the situation is new to the members and not clearly defined. Group members may be unsure of whether the group is safe, whether they belong to the group and are accepted, and what the rules of conduct and procedures will be. The tasks for group members to accomplish during this stage are to (1) ensure that they are accepted as a group member and (2) determine whether they accept the others (Wheelan, 1994).

During the second stage, *counterdependency and fight*, the group's members attempt to balance the amount of influence and responsibility possessed by individual members (Tuckman & Jensen, 1977; Wheelan, 1994). The group's tasks are to clarify goals, values, boundaries, and forge unity out of diversity. During this stage, members must: (1) reach agreement about basic values, goals, and commitment to these goals, (2) gain a desirable amount of influence over how much work they will do, and (3) obtain an
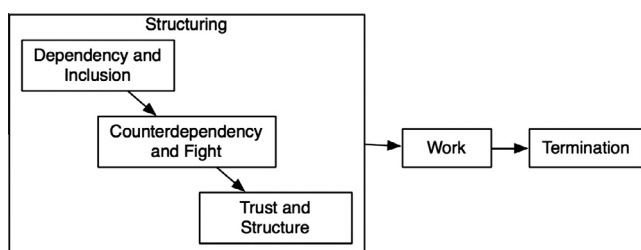
acceptable level of responsibility over the group's completing the task (Wheelan, 1994).

The third stage, *trust and structure*, is characterized as consisting of a more mature negotiation about goals and procedures (Tuckman & Jensen, 1977; Wheelan, 1994). The group is designing its structure in this stage, planning the way it will accomplish its objective(s) and laying the groundwork for productive and trusting relationships with each other. The objectives of group members during this stage are to: (1) obtain an acceptable role assignment in terms of relative amount of work and level of responsibility, (2) ensure that other members of the group have appropriate roles, and (3) establish a relationship of trust with the other members (Wheelan, 1994).

The *work* stage is a time of intense productivity and effectiveness (Tuckman & Jensen, 1977; Wheelan, 1994). Effective work depends on the group's ability to use available resources such as information, expertise, and materials. Groups that are not working as effectively as they would like have probably not resolved issues from one of the earlier stages. For example, the work in five out of twelve virtual teams in one study was evaluated as poor, and these teams were characterized as "disorganized and desperate" as their deadline approached due to incomplete development (Sarker & Sahay, 2003). When groups have a distinct ending point, they may have the fifth stage, *termination*, in which members assess the performance of the group.

2.2. Group development in virtual teams

It has been suggested that virtual teams should also follow a development process in order to effectively work together (Hertel, Geister, & Konradt, 2005; Sarker & Sahay, 2003). However, these studies note that the overlay of ICT in virtual teams creates "disadvantages due to new communication technologies" (Hertel et al., 2005, p. 72), which impede their development. Such issues might include: (1) an inability for group members to identify referent others that are similar in ability, which means that they might have more uncertainty and be less able to preserve or enhance their self esteem (Greenberg et al., 2007), (2) an increased likelihood of conforming to perceived group norms because a lack of individual identity (Lea, Spears, & de Groot, 2001), and/or (3) an increased likelihood of socially unacceptable behavior (Haines, Cao, & Haines, 2006; Kiesler, Siegel, & McGuire, 1984). In spite of this, it has been proposed that virtual teams will be experienced the same as face-to-face teams given enough time and sufficient message exchanges (Walther, 1992). Thus, ability of virtual teams to develop properly remains an open question.

For purposes of this study, I assumed that virtual teams might develop normally over a short enough time period for experimental examination if they were given a simple enough task that did not involve a large amount of information with which to make comparisons to referent others (cf., Michinov & Primois, 2005). If and when I observe potential problems due to the use of ICT in these virtual teams, a better, more holistic view of how those affect the entire group development process can be obtained. The details of the experimental task will be given later. The hypotheses follow.

In face to face teams, issues from each stage of group development must be at least attended to before the team can move on to issues of the next stage of development. Issues of subsequent stages can only be resolved to the extent that issues of the previous stage have been resolved (Wheelan, 1994). In virtual teams research, a similar flow through the development stages is assumed to be necessary for the proper function of a virtual team (Oemig & Gross, 2007; Sarker & Sahay, 2003). However, delays might occur because virtual teams are often too task-focused (Dubé & Robey, 2009; Fransen, Kirschner, & Erkens, 2011;

Fig. 1. Stages of group development.