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Form and Function-Group Style Differences between Computer Mediated and Fact-To-Face Teams

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ABSTRACT

Face-to-face (F2F) teams form and function differently than computer mediated (virtual) teams. The social processes associated with effective team work are different in F2F and virtual teams. These differences affect the ability of groups of people to successfully form a team that can function effectively. This study found that computer mediated teams differ significantly from F2F teams along important group style dimensions as measured by the Group Style Inventory.

KEYWORDS

Teams, virtual, collocated

INTRODUCTION

In recent years, there has been a growing interest in understanding the behaviors of computer-mediated (virtual) teams, and factors that affect their effectiveness. Due to advancements in computer technology and the internet, as well as the increasing need for collaboration between and within companies, the use of virtual teams is on the rise. It is becoming increasingly clear that computer-mediated communication systematically and significantly changes the socialization processes necessary for effective teaming.

Hayward Andres (2006) studied the impact of communication medium on virtual group processes. His study investigated the hypotheses that team structure and communication mode will impact the evolution of virtual group processes. The author studied the behavior of software development teams. The teams were set up working in face-to-face (F2F) or videoconference settings to develop detailed design documentation for specified enhancements to a hypothetical university information system. The research indicated the six videoconference teams exhibited more subgroup information exchange when compared to the six F2F teams, where more team-wide collective behaviors and information exchange were observed. He concluded that greater team collective behaviors gave rise to improved information sharing activities among F2F team members.

Jarvenpaa and Leidner (1999) looked at the challenges of creating and maintaining trust in a global virtual team. The authors reported on a series of descriptive case studies on global virtual teams that worked on a

common collaborative project with computer-mediated communication and whose members were separated by location and culture. The authors conclude that trust can exist in teams built purely on an electronic network.

Schmidt, Montoya-Weiss and Massey (2001) compare individuals, F2F teams and virtual teams in the area of new product development effectiveness. Two experiments were conducted to examine the effectiveness of new product development project continuation decisions. Study one compared individual versus F2F decision-making effectiveness. Study two compared the decision-making effectiveness of individuals, F2F teams and virtual teams. They concluded that teams make more effective decisions than individuals and in their study virtual teams made the most effective decisions.

Branson, Moe and Sung (2005) found that virtual teams process less information than individuals in decision making tasks. It appears that even though F2F teams often use more information and make better decisions than individuals, virtual teams use less information than individuals or F2F teams (Branson, Sung, Decker, He 2005; Coopman 2001). Virtual teams spend more time managing the team processes, and less time in processing information and decision making; even when the task is a decision making task. Branson, Sung, Decker and He (2005) found that F2F teams processed more information than individuals, and that individuals processed more information than virtual teams when making a performance appraisal decision.

Alge, Wiethoff and Klein (2003) examined whether temporality - the extent to which teams have a past or expect to have a future together – affects F2F and virtual team's ability to communicate effectively and make high quality decisions. Results indicate that media differences existed for teams lacking a history. F2F teams exhibited higher openness and information exchange than virtual teams.

Warkentin and Beranek (1999) discussed the effect of communication training on virtual group interactions, especially for enhancing rational links and thereby improving communication and information exchange in virtual teams. They concluded that teams that were given appropriate training exhibited improved perceptions of the interaction process over time, specifically with regard to trust, commitment and frank expression.

Successful teaming requires effective socialization processes. In order to assess the socialization processes, Cooke and Szumal (1994) developed the Group Inventory Style and categorized group interaction as constructive, passive/defensive, or aggressive/defensive. The constructive style taps the full potential of group members and produces effective solutions. The constructive style enables group members to fulfill both needs for personal achievement as well as needs for affiliation. The constructive style allows the full potential of group members to be realized and facilitates effective solutions by the group, which are achieved through consensus. Constructive styles exist when team members are trying to satisfy their higher order needs (need for affiliation and achievement). The passive/defensive style team will accept less than optimal solutions. Team members will accept decisions which have not benefited from constructive differing, creative thinking and individual initiative. Passive/defensive groups behave in ways that fulfill their security needs by placing greater emphasis on fulfillment of affiliation goals only. They are interested in maintaining harmony in the group, and accept limited information sharing, questioning and impartiality. The aggressive/defensive style emerges when members approach the problem in ways intended to help them maintain their status/position and fulfill their need for security by task related activities. Aggressive/defensive groups are concerned with need for power and need for control. Aggressive/defensive groups are characterized by competition, criticism, interruptions and overt impatience (Cooke and Lafferty 2003).

Cook and Szumal's research was mainly based on F2F teams. Later Potter and Balthazard (2002) expanded their work by investigating virtual teams with group inventory styles techniques to determine whether factors that drive conventional team performance also exist in virtual teams. The authors

examined the decision process and performance styles of 42 virtual teams and analyzed the data using zero-order correlation and t-test statistical methods and reached the conclusion that virtual teams also exhibit distinctive group interactive styles found in traditional F2F teams. However, there has been few studies that examine the differences in group styles found in virtual teams and F2F teams. This paper examines the group style differences between F2F and virtual teams by using the Cooke and Lafferty *Group Styles Inventory* (GSI) to measure and compare the structure and social processes of virtual and F2F teams.

CURRENT STUDY

Task type can have a systematic effect on team formation and functioning. Driskell, Radtke, and Salas (2003) developed a task classification system which used six basic categories: (1) mechanical/technical tasks, requiring the construction or operation of things; (2) intellectual/analytic tasks, requiring generation of ideas, reasoning, or problem solving; (3) imaginative/aesthetic tasks, requiring creativity or artistic endeavor (4) social tasks, requiring training, supporting, or assisting others; (5) manipulative/persuasive tasks, requiring motivation or persuasion of others; and (6) logical/precision tasks, requiring performance of routine, detailed, or standardized tasks.

Not surprisingly, teams will form and function differently based on the type of task they have. Because task type can systematically affect the form and the function of a team, this study controlled the effect of task type by holding it constant. All teams in this study were assigned the same task, which was an intellectual/analytical task. Holding task constant allows us to more fully understand the effect of team type (F2F versus virtual) on how the teams formed and functioned. In this study each team was provided with financial and non-financial information related to the performance of eight organizational units, and the teams were asked to conduct a performance appraisal of the manager of each unit.

The GSI was administered to sixty-two teams of students (with 3-4 members) at a major Midwestern university. Thirty of the teams were F2F teams and thirty-two of the teams were virtual teams. The virtual teams did all their work using Blackboard and other virtual tools such as e-mail, fax, and telephone.. The members of the virtual teams were on different campuses of the university, did not know each other, and were not able to meet in person. The average age of the subjects was 31.6 years; average years employed 11.4; 64.5% were female; 24% were post bachelors level, with 4.6% holding terminal degrees (PhD, JD, MD). The subjects were mostly night students pursuing professional development. All the subjects had extensive experience in team work, and most used virtual teaming in their current jobs. There were no significant differences in the demographics of the two types of teams.

The GSI measures twelve dimensions of group styles, which collapse into the three group styles: constructive, passive/defensive, and aggressive/defensive. The central question of this study is “does team type (virtual versus F2F) systematically and significantly effect how teams form and function, as measured by the *Group Style Inventory*”. Consequently our hypotheses are:

- H₀: There will be no difference in the group styles of virtual and F2F teams.
- H_{a1}: F2F teams will be higher on the constructive styles than the virtual teams
- H_{a2}: Virtual teams will be higher on the passive defensive/styles than the F2F teams.
- H_{a3}: Virtual teams will be higher on the aggressive/defensive styles than the F2F teams.

RESULTS AND CONCLUSIONS

In order to determine if there is a systematic difference between the two groups (virtual and F2F teams), a SAS T-test procedure was conducted on the twelve group styles of the GSI for the thirty-two virtual and the thirty F2F teams and resulted in the following:

Table 1
Group Style Inventory Differences Between Virtual and Face-to-Face Teams

| Style/Group Type | Mean (\pm Standard Error) | | P-Value |
|----------------------------|------------------------------|------------------------|---------|
| | Face-to-Face | Virtual | |
| CONSTRUCTIVE STYLE | 76.46 (\pm 1.6767) | 70.20 (\pm 1.5196) | 0.0008* |
| Achievement-oriented (11) | 18.73 (\pm 0.4465) | 16.51 (\pm 0.4439) | 0.3597 |
| Self-actualizing (12) | 17.79 (\pm 0.5705) | 17.12 (\pm 0.4677) | 0.0074* |
| Humanistic-Encouraging (1) | 19.55 (\pm 0.4453) | 18.02 (\pm 0.4580) | 0.0203* |
| Affiliative (2) | 20.39 (\pm 0.4008) | 18.55 (\pm 0.3982) | 0.0018* |
| PASSIVE/DEFENSIVE STYLE | 15.58 (\pm 0.9493) | 16.21 (\pm 1.1696) | 0.6807 |
| Approval oriented (3) | 3.74 (\pm 0.3787) | 3.10 (\pm 0.2933) | 0.1833 |
| Conventional (4) | 6.12 (\pm 0.2625) | 5.74 (\pm 0.2971) | 0.3477 |
| Dependent (5) | 2.95 (\pm 0.3618) | 4.03 (\pm 0.5242) | 0.0977 |
| Avoidance (6) | 2.77 (\pm 0.4036) | 3.30 (\pm 0.3971) | 0.3555 |
| AGGRESSIVE/DEFENSIVE | 9.55 (\pm 0.7650) | 9.14 (\pm 1.3702) | 0.7954 |
| Oppositional (7) | 3.30 (\pm 0.2886) | 2.76 (\pm 0.4138) | 0.2874 |
| Power-oriented (8) | 2.21 (\pm 0.2630) | 3.14 (\pm 0.4837) | 0.0998 |
| Competitive (9) | 1.19 (\pm 0.1725) | 1.01 (\pm 0.2900) | 0.6045 |
| Perfectionist (10) | 2.85 (\pm 0.2780) | 2.23 (\pm 0.4180) | 0.2256 |

* indicates significant difference (at 0.05 level) in means of F2F and virtual teams.

Our results indicate the means are significantly different between virtual and F2F teams for constructive style; the achievement oriented, humanistic-encouraging, and the affiliative dimensions. The mean scores for constructive style, achievement-oriented, humanistic-encouraging, and affiliative dimensions were significantly (at the .05 level) higher for the F2F teams. All the other styles and dimensions did not have significantly different means (at the .05 level).

It is clear from the data that F2F teams have significantly higher scores on the constructive style. The F2F teams have lower scores on the passive/defensive style, dependent, avoidance, and power-oriented dimensions. F2F teams score higher on:

- 1) Achievement- wanting to get things done and performing well; interacting in a rational way; breaking complex tasks down into sub-problems; developing high quality decisions.
- 2) Humanistic-encouraging- where members are sensitive, supportive of other members; are generally constructive; are interested in the growth and development of fellow group members; provide each other support and assistance; are able to build on the suggestions/ideas of other team members; and reach high quality decisions
- 3) Affiliative- where emphasis is placed on interpersonal relationships; members treat each other well, communicate openly and like to work together. Solutions are not always the best, but team members support the team decisions.

On the other hand, virtual teams score higher on the passive/defensive, dependent, avoidance, and power-oriented dimensions where group processes prevent effective teaming, and lead to inferior decisions. Virtual teams are less able to minimize the negative effects of teaming on good decision making. Branson, Moe and Sung (2005) and Branson, Sung, Decker and He (2005) found that virtual teams do not

process as much information in a decision as individuals or F2F teams. Virtual teams appear to form in a way that makes good group decision making difficult. This study supports the idea that virtual teams form and function in a way that lead to suboptimal decision making. Virtual teams appear to be more passive/defensive than F2F teams. As a result, they are more concerned about issues other than making good decisions. Teams make suboptimal decisions when team members are more concerned about maintaining position and power than pooling information and developing more comprehensive models of the problem that can then activate new knowledge.

A SAS GLM procedure was conducted to see if team type (virtual or F2F) or any of the demographic variables had a significant effect on the group style. Results indicate that team type had a significant (at the .05 level) impact on the achievement-oriented, humanistic-encouraging, affiliative and constructive styles. Team age (average age of team members) had a significant (at the .05 level) effect on the “conventional” group style, which tends to have high pressure to conform, have team members who think alike, that avoid innovative or creative ideas, and that make poor decisions. Team gender (all male, all female, or mixed gender) had no significant effect on any of the twelve group styles. All other demographic variables had no significant effect on group style.

The conclusion of this study is to reject the null hypothesis and to accept the alternative hypotheses. Our conclusion is that virtual teams have both form and function problems that are the result of their “virtual” nature. The virtual teams in this study were significantly lower on the constructive style and higher on the passive/defensive style than the F2F teams. The consequences of this discovery are that virtual teams are less able to achieve the positive results possible in group decision making performance.

Our results indicate that F2F teams score higher on the achievement oriented style, which means they form goals, establish a plan, and proceed in a reasonably structured way. F2F teams score higher on the humanistic-encouraging style which has group members who are interested in each others growth and development, provide one another with assistance and support, and constructively build on each other’s suggestions. F2F teams also score higher on the affiliative style, where members are strongly committed to the group while focusing on reaching the best solutions.

On the other hand virtual teams score higher on group styles that lead to less optimal decisions. Even when virtual team members have a highly developed social intelligence, they are unable to collect important social information and often resort to behaving in less than socially intelligent ways. As a result, it appears that virtual team members tend to behave in ways that are more consistent with passive/defensive or aggressive/defensive behaviors. These behaviors can have a significant impact on team performance on a decision making task. For virtual teams to be as effective as F2F teams, people who work on virtual teams will have to learn more about the limitations and problems with virtual teaming, and develop effective strategies to overcome these limitations. Effective communication that allows team members to collect important social intelligence is an important part of the solution. Technology has evolved faster than human sociology. We are on a new frontier of human relationships, and it will take time to learn how to successfully relate to and work with other people in these new and rapidly changing technological environments.

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