Trust and Leadership in Virtual Teams

Kristi Lewis Tyran, Western Washington University, Bellingham, WA 98225, USA; E-mail: Kristi.Tyran@wwu.edu

Craig K. Tyran, Western Washington University, Bellingham, WA 98225, USA; E-mail: Craig.Tyran@wwu.edu

Morgan Shepherd, University of Colorado, Colorado Springs, CO 80933, USA; E-mail: mshepher@mail.uccs.edu

INTRODUCTION

Team activity has long been a core aspect of organizational life. Traditional teams have primarily interacted in a face-to-face setting. However, due to globalization and advances in technology, it is no longer necessary for team members to be located in the same place and meet at the same time in order to perform at a high level. Instead, it is possible for "virtual teams" of people supported by electronic collaboration technologies to meet in a distributed setting and collaborate across distance, time and organizational boundaries (Lipnack & Stamps, 1997). Due to the operational and competitive advantages associated with using virtual teams, the virtual team approach is rapidly being adopted in organizations. For example, high technology companies and consulting firms have relied on virtual teams for several years to reduce costs, reduce project time, and enhance decision making and communication (Duarte & Snyder, 1999; Townsend, DeMarie & Hendrickson, 1998).

The "virtual" environment can impose new types of challenges for the management of virtual teams (Pauleen, 2003-04). The development of trust among virtual team members can be a particularly important factor associated with team performance (Jarvenpaa & Leidner, 1999). While the development of trust in a virtual environment may not be easy, it can be a critical component for virtual team success (Duarte & Snyder, 1999; Handy, 1995; Jarvenpaa, Knoll, & Leidner, 1998; Paul & McDaniel, 2004). One potential way to enhance trust in teams is through effective leadership. Research on effective leadership in traditional, face-to-face teams is voluminous. Recently, however, a model of effective leadership has been proposed by Avolio and colleagues that argues for authentic and transformational leadership as most effective (Avolio, Gardner, Walumbwa, Luthans & May, 2004). They view effective leadership as, among other things, motivational, participative, inspirational, and authentic (Avolio, et al., 2004; Bass & Steidlmeier, 1999).

Leadership in virtual teams requires the ability to inspire and motivate others without face-to-face interaction. Research on virtual team leadership supports the Avolio, et al. (2004) model of an inspirational and understanding leader as most effective in that context (Kahai, Fjermestad, Zhang & Avolio, 2007). For example, in their field study of 13 virtual teams, Kayworth & Leidner (2002) found that the most effective virtual team leaders acted as mentors for other team members, motivating them through a participative and authentic style.

For our "research in progress," we will describe a study in which we investigate the role of emergent leadership on the facilitation of trust in virtual teams. Research questions to be addressed by the study include: Are emergent leaders in virtual teams considered to be more trustworthy?; If so, in what ways? Do trustworthy leaders help to enhance trust within a virtual team? For purposes of this manuscript, the three factors of trustworthiness suggested by Mayer, Davis & Schoorman (1995) – ability, benevolence, and integrity – will be explored using a survey instrument designed by Bigley (1996). The data for the study has been collected and is in the process of being analyzed. The next section provides a brief overview of the study, followed by brief summaries of preliminary results and the potential contributions of the research.

OVERVIEW OF STUDY

Sample: The research study has employed a case study approach to learn more about the perceived characteristics of emergent leaders in virtual teams. Participants in the study included 101 students who were members of a distance-learning executive MBA program operated by a university in the United States. The mean age of the participants was 33 years old and 70% were male. The participants were distributed throughout North America and typically had several years of managerial experience.

Teams and Tasks: The participants were randomly assigned into 26 distributed groups consisting of four members each (three teams had three members). Over the duration of the class term of fifteen weeks, each team performed ten graded team assignments associated with an introductory Information Systems course. To provide each team member with an opportunity to apply and demonstrate leadership skill in a virtual team setting, each member was randomly assigned to serve as the "team leader" for two of the team's assignments. The team leader's role was to oversee the work tasks associated with the team assignment. Team leaders were allowed to implement their own approach and style in leading the team. After each team member had rotated through two stints as a team leader, then the teams were allowed to select a leader for the remaining assignments. (The group size was selected to be four members to allow each to allow each team member to serve as a team leader for at least two of the ten assignments and to allow the teams to have the opportunity to select a leader for the later assignments.) The team tasks included five business case analysis assignments (i.e., Harvard Business School cases) and five "summary paper" assignments involving a report on a technical or managerial topic in information systems. To complete the tasks, the team members communicated via e-mail and phone. Based on the reports of the participants, no team members for any team met face-to-face.

Data Collection: The data collection included weekly self-reported communication behavior logs, a post-study survey questionnaire, and performance evaluations. The communication logs were used to determine the extent to which the team members interacted with one another and the type of communication media used. The survey questionnaire included several items aimed at assessing perceptions of trust. In part, trust was measured using a survey developed by Bigley (1996) based on work by McAllister (1995) and Mayer, et al. (1995). This 18-item instrument was used to measure perceptions regarding three types of trust: role performance trust (based on task performance), affective bond trust (based on close relationships, such as friendship), and ethical integrity trust (based on a belief in the ethical integrity of the individual). Each team member was also asked to assess the other members with respect to perceived leadership effectiveness using a 4-item scale. (Survey instruments used for this study are available upon request.) Ninety of the participants completed the final survey for a response rate of 90%.

PRELIMINARY RESULTS

A regression analysis was conducted to address the research question of whether or not emergent leaders in virtual teams are considered to be more trustworthy. The means, standard deviations, and correlations of the regression variables are shown in Table 1. The scale reliabilities for the measurement scales were good. Although the correlations among variables was high, based on a review of the variance inflation factor (VIF) indices for the regression coefficients (Cohen, Cohen, West, & Aiken, 2003), multicollinearity did not appear to be a problem. A factor analysis of Bigley's (1996) trust survey instrument confirmed that the trust measures clearly loaded as three distinct factors.

Table 2 shows the unstandardized regression coefficients and intercept, the standardized regression coefficients, and R^2 for the regression analysis. The overall R^2 for the regression model was high (0.85). For this model, the significant coefficients corresponded to the role performance and affective bond trust factors, with role performance trust most strongly related to perceived leadership effectiveness. Ethical integrity trust was not significant. Drawing from the preliminary findings of this study, it appears that the ability and benevolence factors of trustworthiness identified by Mayer, et al. (1995) were most strongly tied to perceptions of leadership effectiveness. In particular, those who rated high with respect to the trust that others had in their demonstrated ability to perform were also considered to be effective leaders.

Table 1. Correlations of trust variables with respect to perceived leadership effectiveness

Variables	1	2	3	4
1. Leadership Effectiveness	–			
2. Role Performance Trust	.91 **	–		
3. Affective Bond Trust	.71 **	.68 **	–	
4. Ethical Integrity Trust	.68 **	.72 **	.78 **	–
	1	**2**	**3**	**4**
No. of Items in Scale	4	6	7	5
Scale Reliability	0.90	0.94	0.89	0.85
Mean	2.96	3.13	2.57	3.05
Std Deviation	0.59	0.56	0.46	0.50

Notes:
1. Scale reliability calculated using Cronbach's Alpha.
2. All scale items were on a Likert scale ranging from 0 ("Strongly disagree") to 4 ("Strongly agree"); higher values reflect a more favorable perception.
3. $*p < .01$, $**p < .001$.
4. N = 90.

Table 2. Regression analysis for variables related to perceived Leadership effectiveness

Variable	B	SE B	β
Constant	-.020	0.16	
Role Performance Trust	0.87	0.07	0.82 **
Affective Bond Trust	0.29	0.09	0.23 *
Ethical Integrity Trust	-0.10	0.09	-0.08
R^2 for total equation (Adjusted R^2)	0.85 (0.84)		
F for total equation	156.2		

Notes:
1. $*p < .01$, $**p < .001$.
2. N = 90.

POTENTIAL CONTRIBUTIONS

Based on our preliminary results, this study has the potential to contribute to the growing body of research on virtual team effectiveness by enhancing our understanding of the role of leadership in the development of trust for virtual teams. Previous literature suggests that virtual teams with higher trust may perform at a higher level (e.g., Jarvenpaa & Leidner, 1999). The trust relationships in any team are complex and variable. In our study, we found that role performance trust and affective bond trust in the leader were strongly related to perceptions of leadership effectiveness. Through a trustworthy leader, trust in a virtual team might be developed and enhanced. Perhaps virtual teams with lower trust levels would benefit from having a leader who was perceived by the team as more trustworthy. We plan to continue our analysis of the study data to gain more insights into the characteristics and implications associated with trust and leadership in virtual teams.

REFERENCES

Avolio, B.J., Gardner, W., Walumbwa, F.O., Luthans, F., & May, D.R. (2004). Unlocking the mask: A look at the process by which authentic leaders impact follower attitudes and behaviors. *Leadership Quarterly*, 15(6), 801-823.

Bass, B.M. & Avolio, B. (1990). *Transformational leadership development: Manual for the multifactor leadership questionnaire.* Palo Alto, CA: Consulting Psychologists Press.

Bass, B.M. and Avolio, B. (1995). *MLQ: Multifactor leadership questionnaire for research*, Redwood City, CA: Mind Garden.

Bass, B.M. & Steidlmeier, P. (1999). Ethics, character, and authentic transformational leadership behavior. *Leadership Quarterly*, 10(2), 181-217.

Bigley, G. (1996). *Follower trust in the leader at work.* Unpublished doctoral dissertation, UC Irvine.

Cohen, J. , Cohen, P., West, S.G., & Aiken, L.S. (2003). *Applied Multiple Regression/Correlation Analysis for the Behavioral Sciences*, Mahwah, New Jersey: Lawrence Erlbaum Associates.

Duarte, D.L. & Snyder, N.T. (1999). *Mastering virtual teams: Strategies, tools and techniques that succeed.* San Francisco, CA: Jossey-Bass.

Handy, C. (1995). Trust and the virtual organization. *Harvard Business Review*, 73(3), 40-50.

Jarvenpaa, S.L.; Knoll, K., & Leidner, D.E. (1998). Is anybody out there? Antecedents of trust in global virtual teams. *Journal of Management Information Systems,* 14(4), 29-64.

Jarvenpaa, S.L. & Leidner, D.E. (1999). Communication and trust in global virtual teams. *Organization Science,* 10(6), 791-815.

Kahai, S., Fjermestad, J., Zhang, S., & Avolio, B. (2007). Leadership in virtual teams: Past, present and future. *International Journal of e-Collaboration*, 3(1), i-viii.

Lipnack, J. & Stamps, J. (1997). *Virtual teams: Reaching across space, time and organizations with technology.* New York, New York: John Wiley.

Mayer, R.C., Davis, J.H. & Schoorman, F.D. (1995). An integrative model of organizational trust. *Academy of Management Review*, 20(3), 709-734.

McAllister, D.J. (1995). Affect- and cognition-based trust as foundations for interpersonal cooperation in organizations. *Academy of Management Journal*, 38(1), 24-59.

Paul, D.L. & McDaniel, R.R. (2004). A field study of the effects of interpersonal trust on virtual collaborative performance. *Management Information Systems Quarterly*, 28(2), 183-227.

Pauleen, D.J. (2003-04). An inductively derived model of leader-initiated relationship building with virtual team members. *Journal of Management Information Systems*, 20(3), 227-256.

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