

Two Group Development Patterns of Virtual Teams: Linear Progress and Adaptive Progression

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Examining the group processes of seven virtual learning teams and the distribution of observed behaviors from each team found two emerged group development patterns, Linear Progression and Adaptive Progression. Linear progression teams followed the linear sequence of orientation, scheduling, exploration, work and decision, progress check and evaluation, refinement and formatting, and termination. Adaptive progression teams found the evaluation of work progress or the outcome of group work was not satisfactory and made an adaptation to the team progress by revisiting one or more of the previous phases based upon needs identified to finish the project.

Key words: Virtual Teams, Group Development, Computer-Mediated-Communication (CMC)

Advancement in information and communication technologies has triggered growing interest in virtual collaboration and knowledge networks. Types of virtual teams, such as global work teams and special project groups via wireless or teleconferencing tools, are promising because not only are communication technologies becoming more cost efficient, but also becoming more convergent, especially on the Internet to enable group collaboration through multiple communication channels (Penzias, 1995). The digital promise has led companies and higher education to implement virtual teams in their training or instructional practices, believing that proven benefits of traditional group work, such as learning from more knowledgeable members and developing social relationships (Cohen, 1986; Jaques, 1984; Johnson & Johnson, 1987), will be immediately applicable to the virtual team settings. Lowered cost and advances in information and communication technologies will extend the use of virtual teams.

Problem statement

Most research on group development of virtual learning teams has been studied without the guidance of theory. One very widely used model in HRD to explain group development is Tuckman's stage model: forming, storming, norming, and performing (Tuckman, 1965). According to this view, in order to become an effective team, a team must progress each group development phase: forming; storming; norming; and performing in a linear fashion and build upon the previous step without skipping any phase. Since the mid 1980's, alternative models that questioned the linear development of a group emerged, mostly from the field of psychology and management, to emphasize the dynamics and self-managing-capacity of small groups (McGrath, 1984, 1991). Mid-transition model (Gersick, 1988, 1989) believes that team members interact actively at the beginning to establish work protocols, the interaction then tapers off until members realize the need to improve their work practices and go through the mid transition to modify the initial work process. The interactions then slack off again until team interactions explode at the final stage to complete the group task. Unlike the previous two models, recurrent model (McGrath, 1984, 1991) claims that groups do not perform one single task for one discrete purpose. According to this view, groups may perform multiple sets of activities to address both the social and the production-related tasks. Therefore, the group development process is recurrent. More recent views on small groups see them through the lens of a complex adaptive system (McGrath, Arrow, & Berdahl, 2000). Unlike the previous group development perspectives, this view maintains that group development is an adaptation process where group level dynamics, such as norms and member roles, are continually shaped and constrained by individual members and contextual factors such as organizational support, member changes, and task demands. According to this framework, group development is bi-directional and nonlinear because group dynamics such as norms and member roles also influence individuals and contextual factors, whose dynamics are repeated until the group termination (McGrath, Arrow, & Berdahl, 2000).

Each model or view commonly attempts to describe the development patterns of small groups and explain how group members work together to accomplish group tasks. However, each view differs from each other in viewing how the team addresses group developmental needs in a linear, mid-transitioning, recurring, or adaptive manner. In addition, the group development focus slightly differs in each view in spite of using the same term, group

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development. For instance, group development in the Mid-transition model is specific to the phases in the accomplishment of a given task (Seers & Woodruff, 1997), whereas, Tuckman's model includes socio-emotional aspects in addition to groups' work protocols. This leads to the lack of generalizability between different group development studies.

Theoretical Framework

A systems perspective that views small groups as a complex, adaptive, and self-organizing system (McGrath, Arrow, & Berdahl, 2000) served as the conceptual framework and the methodological guideline for this study. Complexity theory has been adopted as a theoretical framework to understand a system in complex situations (Axerlod & Cohen, 1999; Simon, 1999). Complexity does not mean perceived cognitive difficulty, but rather signifies that new properties emerge from the system when individual parts within the system interact. Individual parts do not inherently have those properties. This description closely matches how virtual team members operate within a virtual team. The central theme related to the process of group development behind this view is that groups develop as a function of changing conditions over time. The lack of verbal clues and technological barriers require diverse management skills, such as the ability to determine the best technology to facilitate communication, and the ability to engender trust and productivity even when there is no direct supervision (Solomon, 2001). When knowledge networks abound in online settings, virtual teams can explore various problem-solving paths that face-to-face teams cannot take. However, these increased network nodes make it difficult to predict paths or patterns for problem solving (Clippinger, 1999).

This view allows one to see the group as a dynamic and adaptive entity that interacts with its members embedded within the team, and also with the larger systems such as organizations within which the team is embedded. As for the aspect of group development, this framework maintains that all groups need to address two generic functions (i.e., completing group tasks and fulfilling member needs) in order to accomplish the group goal. This view is aligned with small group studies that consider group development as bifocal: group development as related to task and socio-emotional dimensions (O'Conner, 1985; Tuckman, 1965; Wheelan, 1994, 1996). This view also reflects the common needs of virtual learning team members to address both needs to complete a group task and develop group affinity over time.

Perceiving the virtual teams as capable of self-managing and adapting to changing environments implies a significant challenge for research paradigms in group development studies. Groups in the past also used communication technologies to deliver and share information, but the role was rather supplemental to face-to-face interactions. However, current online communications greatly differ from those of the past because the Internet provides a cost effective way to network people and manage work processes crossing the time and space boundaries. Before the Internet, there were communication technologies such as fax, telephone, and satellite systems that allowed people to communicate at different times and locations, but the cost and adoption of the previous technologies were not at a par with face-to-face interactions. In modern work teams, employees utilize information technologies to improve coordination, flexibility, dynamics, and responsiveness without being restricted by physical proximity (Lucas, 1996). This networked and flattened form of organization is radically different from the previous hierarchical forms of organizations because responsiveness to rapidly changing environments is preferred over the stability of the hierarchical decisions. Each individual in those networked work teams can initiate actions, thus distinct group behaviors appear in complex systems. Clippinger (1999) maintains that the way complex systems operate is neither deterministic nor linear. Within virtual teams, group development will be embodied by how the group members have interacted with and adapted to their changing circumstances. Rather than identifying definitive group development patterns, group development in network-path-rich virtual teams will be more interested in finding regularities and a repertoire of actions that enable the system to stay within a reasonably stable structure and to evolve to more effective actions for reusable responses toward an environment.

Research Questions

Without preemptive knowledge about what virtual team members do, and based upon understanding from the literature that virtual team members utilize synchronous and asynchronous communication technologies, the researcher originally formulated research questions to examine the group development of virtual teams by asking what they do synchronously and asynchronously in order to address the need for accomplishing work and supporting the team members. However, examining the group communication logs, students' email messages, and posted messages indicated that virtual learning teams in this study heavily utilized synchronous communication, whereas asynchronous tools were merely used to post draft works and exchange documents. In addition, the coding system

development processes led to the identification of a third domain that was crucial for group development in virtual learning teams. Observed behaviors for the third domain were not performed to accomplish work or develop member relations, which were two major group development functions identified from the group development literature. The researcher named the third domain as *Management*, which captured members' behaviors related to managing the group meeting, scheduling, and addressing technology issues. Based on these adjustments, research questions were modified as below:

1. What are the major behaviors that virtual team members perform?
 - a. What behaviors do virtual team members perform for work needs?
 - b. What behaviors do virtual team members perform for social needs?
 - c. What behaviors do virtual team members perform for management needs?
2. How are the major behaviors for different group functions distributed over time?
 - a. How are the major work-related behaviors distributed over time?
 - b. How are the major social-related behaviors distributed over time?
 - c. How are the major management-related behaviors distributed over time?
3. What are the major group development/patterns of virtual learning teams?
 - a. Which forces shape and constrain the emergence of group development patterns?

Research Design

This study was naturalistic and explorative in that the participants were observed through a typical online distance course environment without any arrangements manipulated for this research. Group development patterns were explored by using the comparable multiple-case study design with simulated virtual work groups (McGrath, Arrow, & Berdhal, 2000). Participants of this study were seven newly formed virtual learning teams working on a final group project in a twelve-week online graduate-level course. All of the thirty-three participants were full time Human Resource Development (HRD) professionals.

The explorative nature of this study required accuracy in interpreting communication behaviors and group development processes. In view of that, this study used the combined method, specifically the phase design model suggested by Creswell (1994) to corroborate findings from different data sources. First, interaction analysis was conducted from archived communication logs to answer the question, "what kinds of messages are exchanged in these small groups *between whom*" (italics added, Sykes, 1990, p. 208). In so doing, reliability on coding schemes was ensured by comparing the results with another coder. At the second phase, summary statistics were used to examine distributions of member behaviors over time. The summary data were used as a leading point to the next phase of identifying major group development patterns of virtual learning teams. Lastly, the researcher investigated which forces were influential on the emergence of group development patterns in virtual learning teams using the forced field analysis (Udinsky, Osterlind, & Lynch, 1981). The analytical framework of force field analysis nicely fit the purpose of identifying influential forces for groups to move from the status quo (i.e., formulation of teams) to the desired status (i.e., successful group development in terms of work completion, member relations, and effective group/meeting management). This study also collected members' background information through a pre-course survey to explore how member backgrounds impacted group development.

Results and Findings

Research Question 1: What Are the Major Behaviors that Virtual Team Members Perform?

Team members exchanged the largest amount of messages for work (59.3%), followed by social (26.3%), and management purposes (14.4%). Wheelan's (1992) definition of work statements, "those that represent purposeful, goal-directed activity and task-oriented efforts" (p. 363), was immensely helpful to distinguish work-related behaviors from other domain-related behaviors, particularly from management-related behaviors. The *Social* domain was defined as members' efforts to build relationships with other team members. The *Management* domain was defined as efforts directed to manage the overall group processes and group meetings, which were distinguishable from explicit task-oriented efforts.

Performed behaviors for work needs. Ten behavioral dimensions were identified under the *Work* domain. The most frequently observed behavioral dimension was sharing (21.3%), which included behaviors such as sharing facts/resources (i.e., sharing objective information) and sharing opinions/ideas (i.e., sharing subjective information). Perhaps the most interesting finding was that the proportion of responding behaviors (10.7%) was lower than that of requesting behaviors (14.4%). Responding behavior was defined as an immediate and direct response to a request

made. This indicates a poor management of the group synchronous chat. Having worked for four years as a teaching assistant and a technical support staff member in online classes, the researcher frequently observed that the message flow of a group synchronous chat was messy, particularly when team members were addressing multiple issues rapidly. Typing a complete sentence takes a lot longer than delivering the same message verbally, and in an online group chat, people tend to read the last threaded messages while typing. Therefore, responses are often distanced from what was originally asked, and read more like an independent thought. This pattern contributes to blurring the beginning and the ending point of a topic, and when a new topic is introduced, the environment gives an impression as if everyone is talking about his or her own thoughts. Consenting behaviors such as agreeing or disagreeing on processes, format, and opinion, etc. were the third most frequently performed behaviors (14.2%). Virtual learning team members also frequently discussed how the team would go about working on the project (14.1%). Classification efforts regarding task, project requirements, and the format of the team's outcome were also commonly observed (11.5%). The Agenda dimension identified statements related to starting, shifting, and closing a topic during the meeting, and the proportion of those statements was comparatively low at 3.4 percent of the entire work-related statements. The Impediment dimension was unique and important in that even though the proportion was not high (3.2%), it was the only negative behavioral dimension that interfered with the team's work accomplishment. The fact that the proportion of impeding behaviors was similar to that of agenda-related statements indicates that these behaviors were not uncommon during the group meetings. Lastly, time-pacing statements were not frequently observed in this study (1.0%). This may be due to the fact that all team members had direct access to the due date information from the course website. Another possibility is that the participants in this study were purposively sampled individuals in an advanced degree program who were sensitive about what was due.

Performed behaviors for social needs. Analyzing the chat records showed that the social domain did not include any other behavioral dimension other than building a relationship. In other words, the conceptual level of the social domain and the dimension of relationship building were identical. All performed behaviors for the social domain were directed at building relationships and included: *Greetings* (27.6%), *Sharing personal life* (18.7%), *Sharing work and professional interests* (18.2%), *Discussing the course* (15.4%), *Pairing and member support* (11.4%), and *Sharing fun and jokes* (8.7%).

Performed behaviors for management needs. As previously stated, the *Work* and the *Social* domain did not capture a large amount of behaviors virtual learning team members performed for group development purposes. Group development implies that there is a point for a group to start its life until the termination. In this regard, group development is a maturation process to complete the goal of the group. Most work groups, including the learning teams, not only accomplish a group task and foster member relations, but also deal with the maturation processes to move forward. The *Management* domain was identified by behavioral efforts made to make such an advancement (i.e., facilitating the overall group development processes and the group meetings). Among the observed behaviors (see Table 8), scheduling was the most frequently performed (35.7%), followed by facilitation (29.2%), reinforcement (17.5%), technology (15.6%), and conformity (2.0%). The high proportion of scheduling showed that virtual learning teams spent a significant portion of the group meeting time on scheduling purposes. Also, the proportion of technology-related behaviors such as reporting and resolving a problem indicated that virtual learning teams needed to resolve technology-related problems and issues during the group development processes.

Research Question 2: How Are the Major Behaviors for Different Group Functions Distributed over Time?

At the beginning, the social domain explained the largest proportion of observed behaviors (42.6% during the first four weeks), followed by work (34.1%) and management (23.1%). The high proportion of the social domain during the early stage of group development might indicate that virtual learning team members try hard to enhance the social presence in an on-line environment before focusing their interactions on work. However, as team members started gathering necessary information for the project and sharing individuals' work progress during the regular group meetings, the work domain became the dominant focus of performed behaviors (65.5% at time 2 and 68.7% at time 3). The management domain remained the lowest at all three times and its proportion showed a decreasing pattern over time.

Examining the distribution of observed behaviors within each domain showed that the proportion of work, social, and management-related behaviors also changed over time. Within the work domain, the proportion of work process-related behaviors continuously decreased over time (20.4%, 16.4%, and 12.5% at time 1, 2, and 3, respectively). This implied that once work patterns are in place, team members started talking less about them. Sharing, requesting, responding, and clarifying behaviors continuously increased over time to show that virtual team members became more engaged in idea collaboration.

Interesting findings were also found in the members' relationship building behaviors. Sharing personal life and hobby was the most frequently performed at time 1 (29.0%), but it became less frequent in time 2 and 3 (10.3% and 8.6%, respectively). Discussing the course and sharing work and professional interests were commonly found at

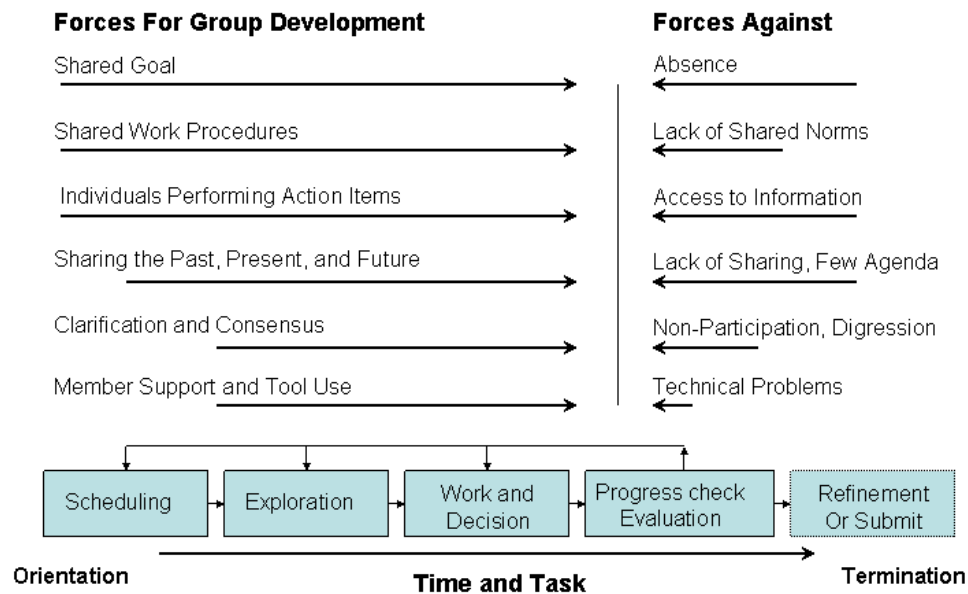
time 1, but those behaviors reduced greatly over time. On the other hand, sharing fun and jokes (5.2%, 13.1%, and 19.2% at time 1, 2, and 3) and pairing and supporting members (13.1%, 19.5%, and 24.6% at each time) showed a considerable increase over time. This indicates that members' relationship development patterns gradually changed from formal to informal over time. Analyzing the distribution of management-related behaviors showed that virtual learning teams in this study recurrently coordinated contingent meetings in order to accommodate traveling team members during group work. Scheduling was expected to decrease over time, but it remained the most frequently addressed management issue (35.2%, 34.9%, and 36.9%). One interpretation about this is that most participants in this study were full time working professionals and most teams had one or two members traveling on business during the group work. With one exceptional case in team G, most contingent scheduling efforts turned out to be extremely difficult and frustrating to team members. The one who reported about his or her absence tended to give only limited information about the absence, and often did not include what alternative times would work or not. As a result, contingent scheduling efforts were followed by repetitive notification of scheduling conflicts. Technology issues were frequently addressed at the beginning (22.9%), and the proportion decreased over time (11.2% and 8.9% at time 2 and 3).

Research Question 3: What Are the Major Group Development/Patterns of Virtual Learning Teams?

Examining the chat logs and the distribution of observed behaviors found two emerged group development patterns in virtual learning teams, *Linear Progression* and *Adaptive Progression*. Two teams (team D and G) developed in linear progression and both teams followed the linear sequence of orientation, scheduling, exploration, work and decision, progress check and evaluation, refinement and formatting, and termination. Five teams developed in adaptive progression (team A, B, C, E, and F) and the initial group development of adaptive progression was the same until the progress check and evaluation phase. However, adaptive progression teams found the evaluation of work progress or the outcome of group work was not satisfactory for team members. Those teams made an adaptation to the team progress by revisiting one or more of the previous phases based upon needs identified to finish the project. Team E made an adaptation by merely adding two more group meetings (revisiting to the scheduling phase) and did not go through any further exploration of work processes or change work/decision making patterns. In team B, adaptation involved setting up additional group meetings, establishing a new work procedure to manage the meeting by agenda, and shifting the interaction focus to work (revisiting to the scheduling and the exploration phase). Team B made a similar adaptation, but the timing and the intensity greatly differed. The change took place during time 3 right before the project due date. As a result, frustration by team members was intense. The degree of adaptation was the greatest in team C, which revisited all three previous phases. When the team switched to a new organization and found that the work progress should be expedited, the team set up additional group meetings and came up with new work procedures (i.e., splitting the reading and mandating to read before the group meeting). This change resulted in the team's work pattern to observe enhanced sharing and increased group consensus. Team F also needed to switch to a new organization due to difficulties in obtaining necessary information. Without such a change, the group development of team F would have been described as linear because the team's progression was sequential. However, switching the project organization enforced the team to explore new solutions to complete the project in time. The team selected phone interviews and a group phone conference and complete the work. Since the team already established clearly shared work and sharing procedures, team members did not set up additional group meetings.

Forces that shaped or constrained the emergence of group development patterns. A combination of forces (i.e., member characteristics, member presence and commitment, emergent group norms, and access to necessary information) influenced a virtual learning team to develop either in linear progression or adaptive progression (see figure 1). Through the force field analysis, the researcher found that member-related characteristics were the primary underlying cause to the successful development of groups, but without being transformed into group norms, the impact on group development was minimal. To illustrate, team A, B, D, E, and G recognized one member's knowledge and experiences related to the project, but only team D and G utilized the expertise from the beginning throughout the course for the purpose of setting up the work procedure, initiating idea solutions, and synthesizing shared perspectives. When members encountered the postponement of project work, other members' topic digression, and differing but never-compromising views regarding the goal of the project, members' expertise did not transform into a shared work procedure to push the project progress.

Figure 1. Influential Forces Impacting the Group Development of Virtual Learning Teams.



Analyzing the pre-course survey result showed that members' work experiences or personality could not predict the emergence of the group development pattern. Members who had relevant work experience or had a personality preference to structure tasks tended to lead the meeting and set up a work pattern for the team, but there were also teams whose most experienced person worked only as a contact person or team members rotated in managing the group meeting. More important was the transformation of member characteristics to the group level so that sharing work procedures, sharing goals, sharing individual members' work, discussing members' views and drawing group consensus, identifying further actions to advance the work, exchanging member support, and utilizing technologies for effective sharing could push team members to address the needs for work, member relations, and management. Second, this study found that virtual learning teams planned and established work procedures based upon project timelines, managed meeting agenda, and performed asynchronous work around provided tasks. As a self-managing team, virtual learning teams identified subtasks and set up due dates for sub-tasks to complete the project. When team members did not perform any action items, that slowed down the work progress of the team. Virtual learning teams' moving ahead of schedule resulted in greater opportunities for sharing, clarifying, and identifying future action items to advance the project. In summary, time and task on this study played the role of a benchmark, pressure, and goal for the purpose of virtual learning team's group development.

The results of force field analysis also identified forces that negatively impacted the group development of virtual learning teams. Similar to positive forces, member-related characteristics were the primary cause of these: member absence, inactive participation, topic digression, little contribution to the group work, etc. When the presence of these negative forces was stronger, the pressure on the team to adapt the team's progression was greater. Obtaining access to necessary information turned out to be one major influential force in this study. Team F observed a strong presence of positive forces and saw few negative forces throughout the course, but experiencing difficulties in obtaining information from the lack of cooperation from the project organization affected the team to develop in adaptive progression. However, it did not impact the quality of group development of the team because even after the change, the team continued to demonstrate high level of work collaboration, member support, and meeting management. Switching to another organization only resulted in a change in the manifestation of group development pattern.

Conclusions

Three functions: *Work*, *Social*, and *Management* are important for successful group development. From the beginning of team formation until the termination of the team, team members' exchanged messages indicated that performed behaviors were targeted to accomplish work (i.e., work), build up member relations (i.e., social needs), and manage the group meeting or the overall group processes (i.e., management). Examining the frequency of all

observed behaviors showed that completing task was the most frequently performed (59.3%), followed by building relationships among the team members (26.3%) and managing the team (14.4%). This shows that virtual learning team members consider the primary purpose of group work as completing the group task. At the beginning, the social domain explained the largest proportion of observed behaviors (42.6% during the first four weeks), followed by work (34.1%) and management (23.1%). The high proportion of the social domain during the early stage of group development might indicate that virtual learning team members try hard to enhance the social presence in an on-line environment before focusing their interactions on work. However, as team members started gathering necessary information for the project and sharing individuals' work progress during the regular group meetings, the work domain became the dominant focus of performed behaviors (65.5% at time 2 and 68.7% at time 3). The management domain remained the lowest at all three times and its proportion showed a decreasing pattern over time indicating that the efficiency of management gradually improved over time.

In addition to three conceptual domains related to group development, this study identified two group development patterns, linear progression and adaptive progression. Each group development pattern could be distinguishable based upon how a virtual learning team progressed through several developmental phases: orientation, scheduling, exploration, work and decision, evaluation, formatting for submission, and termination. Linear progression teams moved along those phases in a step-by-step manner, whereas adaptive progression teams needed to make a backward movement in moving along those phases to adapt to a contingent situation, which was typically detected during the evaluation phase. Which development pattern a virtual learning team's group development displayed was not as important as how clear the shared goal and work procedures were, how much sharing team members had to draw group consensuses, how much member support and assistance the team maintained, and how effectively and efficiently the team addressed those over time. Although one team in this study developed in adaptive progression due to the need for switching the project organization, group development of this team was highly successful and demonstrated high effectiveness and efficiency in managing all three functions. Importantly enough, effectiveness and efficiency in work, member relations, and group management (including the group meetings) characterized the group development of linear progression teams. This is likely since those two linear progression teams could develop in linear progression owing to the team's successful management of positive forces. Virtual learning teams that poorly addressed establishing a shared goal and work procedures, did not share agenda and lacked agenda during the meeting, had little sharing of ideas and opinions, had slow work progress by individual members, and did not actively utilize technologies did not make a smooth transition between each phase. These teams observed unsatisfactory evaluation on the team's work progress and outcomes. Evaluation results were also unsatisfactory when teams observed frequent member absences and had no procedures to address member absence, inactive participation, or topic digression by members. Technologies did not seem to be the most influential toward the development of virtual learning teams. Teams resolved most technical problems through the course.

Contribution to Research and Field of HRD

Findings and interpretations between different group development studies are difficult to compare, largely due to the lack of details about (1) examined groups, tasks, time, and contexts of the research setting and (2) the validation of used coding scheme. To better understand the group development of virtual learning teams, development of a comparison framework for these issues is crucial. This study provided a comparison framework on those issues. For member characteristics, this study selected newly formed virtual learning teams whose members never worked together, were geographically dispersed, and were expected to maintain relationships after their project work was done. Types of groups and member composition are important variables in need of clarifications in conducting research. Task characteristics within this study were a real-world project that included a planning and a brainstorming task (McGrath, 1984). This study examined the group development of virtual learning teams in a semester-long advanced degree course. Future studies should clarify the scope and types of these issues to enhance the generalizability between group development studies. As stated previously, most research on group development of virtual learning teams has been studied without the guidance of theory. To better understand the relationship between group development and other variables, guidance from a theoretical framework is most important. This study examined the group development of virtual learning teams from the complex adaptive systems (CAS) perspective and confirmed that virtual learning teams showed the characteristics of self-managing teams from the CAS perspective in that they adapted to the complex online environment in linear or adaptive progression.

Developing a valid coding system and refining an existing coding system is a venue in needs of further exploration to better understand the group development of virtual learning teams. As Weingart (1997) stated, self-reports on group processes are useful to understand the perspective of informants, but answers may differ from what people actually do. So much can be learned about group development by examining what team members as a group

do. Given the nascent knowledge of virtual learning teams, improvement of existing coding systems are in high demand. Constructing a valid and reliable coding system is an on-going process, and replication efforts are necessary to enhance the validity, reliability, and generalizability of a coding system. The validity and reliability of the developed coding system will never be finalized. Instead, it will be continuously refined with enhanced power to accurately capture the group development processes and reduce the complexity to understand the phenomenon. Findings about group development from one source can be compared with those from another source to enhance the accuracy in interpretation.

Virtual teams are growing phenomena of interests for the field of HRD. As facilitators of work groups that include virtual teams, when contingent issues abound in virtual environments, we cannot rely on a predictive stage model to guide the group development of virtual work groups. Instead of finding a unitary one-way causal model, more important and realistic task will be to find regularities and a repertoire of actions that enable the virtual team members to stay within a reasonably stable structure and to evolve to refine effective actions to successfully complete a group task and enhance the member relationship. As virtual learning teams are being widely implemented for the improvement of learning in educational and training contexts, renewed interests in small group studies, whose results and research design are comparable among similar studies, are expected.

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