Participation Matters: Evaluating Shared Leadership in Online Games

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Abstract: Socialization and teamwork enhance the learning experience, and as online teams perform complex tasks, can they benefit from sharing the leadership role? This study examines shared leadership in virtual teams that meet in an online game and examine participant perceptions as well as direct measurements as the leadership role was shared. The paper reviews the research method and research design for evaluating shared leadership within an online game simulation kit set in a 3D virtual world, and then analyzes the experiment's results and compares them to understand how online courses can benefit from shared leadership opportunities.

Introduction

Eleven years ago, about a quarter of a billion people were on the Internet globally, and by June 30, 2012, the number grew to over 2.4 billion Internet users as reported by the Miniwatts Marketing Group (2012) in their Internet World Statistics. The shift from traditional work to the online workplace and from campus classes to online learning spaces has changed the roles and behavior of cooperative work dramatically (Lipnack, 2000).

The challenges of online teams includes the lack of face-to-face accountability and direct interaction, yet online teams share qualities in common with traditional teams, such as the

need to *form* into a group, to *storm* or handle conflict, to *norm* or find successful patterns of behavior and to *perform* and accomplish the team's goals (Tuckman, 1965). To improve teamwork through an understanding of virtual team relationships, this research examined how the leadership role was shared in virtual teams that participated in an online game that was set in a virtual world.

While there have been several empirical studies on leadership, they tend to focus on the traditional leadership model of one leader and several followers (Burke et al., 2006) and do not examine the opportunities afforded by nontraditional or shared leadership (Morgeson, DeRue, & Karam 2009). This paper describes a research design for evaluating shared leadership and examines the opportunities that shared leadership offers for online courses.

Virtual Teams

A team is defined as a group of two or more members that work together to achieve a common goal (Morgan, Jr. et al., 1986), and these teams accomplish tasks though synchronized efforts (Plovnick, Fry, & Rubin, 1974).

Virtual teams are comprised of individuals that interrelate through interdependent tasks with a common purpose or goal (Lipnack & Stamps, 1997) and they perform cooperative work using a variety of tools, including conferencing, document sharing tools, live video, video capture, shared whiteboards, virtual worlds, online games, simulations and online course tools (Hamons et al., 2011).

The asynchronous nature of an online course adds a level of complexity to the performance of tasks in a virtual team. The process of forming, storming, norming and performing group activities (Tuckman, 1965) is especially challenging with online teams who meet at different times and do not form close associations or use voice communication tools.

Shared Leadership

Leadership is the key for team success (Bittel, 1984), and as virtual teams became more prevalent, the importance of effective virtual team leadership has grown (Burke and Chidambaram, 1994). Virtual teams in online courses may not have strong organizational skills, a good understanding of virtual team processes and access to easy to use tools that streamline the development, discussion, production and subsequent review of cooperative work, and may struggle with schedule deadlines, uncertainty when it comes to their assigned activities and with selecting a leader. In teams where the leader is assigned, the results can be disastrous, it might be better if the team utilizes self selection assignment of roles within the virtual team.

The concept of shared leadership goes back to Follet (1924) with *the law of situation* (Pearce and Conger 2003). The law states that rather than follow a designated leader, one should follow the person with the most knowledge about the situation (Follett 1924).

Although the concept is not new, shared leadership has not been widely accepted. Traditional leadership behavior has overshadowed opportunities for team members to share in the leadership role.

With the increased interest in online cooperative work among virtual teams, highly specialized individuals are joining these teams and may be participating with a willingness and desire to lead. The leadership role can be passed or shared in a natural fashion as different phases of the team's activities unfold.

This presents a few challenges in a virtual environment, as virtual team leaders have a higher cognitive load as they strive to master their navigation and communication skills while exercising their delegation and facilitations skills (Bell and Kozlowski 2002). A shared leadership team needs members that can follow and lead as necessary to support the end goal of the team.

To further the understanding of shared leadership, research from the Center for Creative Leadership at the US Air Force Academy identifies the interdependent leadership model, which explores leadership alternatives and how decisions are made by team members (McCauley 2008; Hughes and Stricker 2009).

Figure 1. Three roles and a virtual team in the Hostage Rescue Game.

Methods

In this study, the quality of team activities and how they achieved their outcomes supported the assessment of the effectiveness of shared leadership. An ethnographic study was designed to collect and analyze the behavior and communications of the game's participants as they played as a virtual team.

Using a mixed methods approach (Frechtling & Sharp, 1997), the researchers recorded quantitative data related to the number of times that a player adopted a leadership role and recorded qualitative information that described the manner in which the leadership role was shared during the game. Each game was video recorded and a data collection instrument was used to monitor and code each player's participation in the virtual team.

Research Design

Prior to the game, the players signed an Informed Consent form and listened to a mission briefing, received their instructions and equipment for playing the game.

Figure 2. Mission briefing in the Hostage Rescue Game.

During the game called Operation Anaconda, a Hostage Rescue Game that is played using Air University's Game Simulation Kit, participants learned during the mission briefing that a United Nations Relief Worker had been taken hostage by insurgents and needed to be rescued. Their goal was to enter the game and use stealth to rescue the hostage quietly, quickly and with minimal conflict.

To monitor conflict and game interaction, the game players were armed and their behavior tracked via automated devices. Their participation activities, including their

movements, communication methods, messages and behavior were video captured and recorded for analysis.

The goal was to observe how the leadership role was assigned, evolved and shared among team members as they struggled to complete the game's mission and objectives.

The environment featured a game simulation kit that was designed by Air University's Innovations and Integrations Division within a virtual world of Second Life. The game's design supported group communication using voice over IP (VoIP), text and by the objects that the players gathered, including the contents of the eight objective flags within the game. These mechanisms made it easier for the virtual teams to communicate using group voice and for the researchers to video capture and track the goals and structure of the team activities and monitor each team member's behavior during the game.

Figure 3. Conflict in the virtual game simulation kit.

With one team playing during each 90-minute game with 3-5 players on the team, it helped to have three observers monitoring and recording each player's behavior, especially when the team split into pairs or wandered away from the group to locate a game objective alone.

Each objective flag was disabled once it was selected, and the player who obtained the information was asked to share it during the mission's briefing. During the game, players would naturally get focused on the activities and forget some of the instructions and details related to the mission.

Measurements

 Two survey instruments were used to evaluate the following research questions before and after the game:

1. Does conflict cause leadership change?
2. Do shifts in leadership occur more with text or spoken information?
3. Does it take less time to reach the objectives if the leadership role is shared?
4. Are teams more effective if all of the members serve in the leadership role?
5. What amount of leadership change produces the most effective leadership?

The direct measurements that were recorded by the observers included:

- Duration of time to reach each objective flag
- Duration of time to complete game simulation
- Method of sharing objective information (voice, physical content, text chat)
- Whether or not objective information is shared
- Number of conflicts between team members
- Number of leadership changes
- Causes of leadership changes
- Quantity of communications as they clarify information
- Quantity of decisions and actions taken as they interact with objects in the game environment

Results of the Ethnographic Study

There were 4 games\teams and 14 players total. All players answered the pre and post simulation surveys. The pre-simulation survey noted the following demographics and prior leadership experience in virtual teams, which helped to identify a baseline for the participants culture with regard to prior experience with virtual teams. The participants fell into four age groups with 42.9% of them in the 40-49 year age group.

Of the total participants, 78.6% of them held a master's degree and all but 14.3% of them worked on team projects with traditional face-to-face teams. 35.7% of them were very proficient with virtual world skills while 50% of them reported that they were somewhat proficient in a virtual environment.

For virtual team experience, 42.9% of them had never worked in a virtual team and 57.1% of them participated in virtual teams at least once a month. 64.3% of the participants had never led a virtual team while 35.7% of them had led at least one virtual team, of which 21.4% had led more than 11 virtual team projects and 7.1% had led more than 20 virtual team projects.

85.7% of them had led a real world team at least once, 42.9% of them had led more than 20 real world teams and 14.3% had no prior leadership experience.

Observations

It was surprising that while many of the participants adopted a shared leadership role throughout the game, the instances that were related to game or team conflict were not perceived to be related to it. The spoken word far outweighed the in game text chat. There were only a handful of text communications and 640 verbal communications. The team that had all the team members serve in the leadership role did well, but did not complete the game the fastest. The last question that observers were considering, "What amount of leadership change produces the most effective leadership?" did not have an answer that was quantitative. After collecting and examining the data it became evident that leadership in virtual environment teams (VETs) is not measureable just by simple counting. In the games the leadership role did not pass back and forth between team members per say. Different members would provide guidance and directions, and sometimes they even did so at the same time.

Does conflict cause leadership change?	No	Conflict did not occur in the research
Do shifts in leadership occur more with text or spoken information?	Spoken	12 of 13 players communicated verbally. 1 player did not have microphone to communicate verbally.
Does it take less time to reach the objectives if the leadership role is shared?	Yes **	
Are teams more effective if all of the members serve in the leadership role?	No	Only 1 team had all the members serve as leader and this team did not finish the quickest.
What amount of leadership change produces the most effective leadership?	Not answered	

** Game 1 had only 1 leader and completed the quickest. The problem with this data is the leader of the group was highly skilled in real and virtual teams according to the survey questions. This leader steam rolled the group and left nothing to chance.

Post-Simulation Perceptions vs. the Direct Measurements

The post-simulation questionnaire focused on four areas to assess a player's perception of their shared leadership participation. First, when asked, "Do you think that you were the leader during the game?" 21% (3/14) of the players said no even though the direct observed measurements showed that 42% (6/14) of the players showed leadership.

Second, the more direct question, "Did you recommend any course of action to your teammates?" was asked. Recommending, the lesser form of ordering, was used to gauge leadership. 85% (12/14) of the players said they had recommended a course of action.

Third, the players were asked, "Did you share the leadership role with your teammates?". 69% of them perceived that they shared the leadership role, reflecting how they think about shared leadership from a vertical perspective.

Finally, "Did you have a single leader for every objective?" was asked of the players. 14% (2/14) replied yes. This evaluation of the hierarchical nature of leadership was attributed to the experiences during their game, in which one team member dominated a virtual team. In the other instance, the participant exhibited shared leadership skills, but did not perceive or acknowledge their participation as a leader.

Table 1. Game Completion Times and Leadership Results.

Game/ Team	Time	Flags Found	Hostage Rescued	Directive & Protective Actions & Behaviors	Shared Leadership	Leaders
1	35 minutes	8	Yes	36	No	1/3
2	54 minutes	7	Yes	57	Yes	2/3
3	48 minutes	4	Yes	14	Yes	3/3
4	41 minutes	3	Yes	23	Yes	4/5

Conclusion

Shared leadership offers distinct advantages with regard to the outcome of virtual teams in online games. Whether these shared leadership experiences translate to online courses or teamwork in a geographically distant workplace needs further study.

Games offer incentives and a focus that players find engaging, and conflict within a game tends to strengthen the team interaction rather than challenge the team dynamics and ability to function smoothly. Virtual team behavior during an online game may differ considerably from online course or teams in the workplace. The conflicts that originate during a game stimulate quick responses and natural behaviors from the players whereas the team dynamics in an online course or work team may feel more personal and subjective, making team members feel uncomfortable rather than stimulated by the conflict. The level of participation and shifts in leadership in group work are not stimulated by a life or death crisis, but by deadlines, the critical nature of the mission and the vested interest in the outcomes.

In online courses, outcomes correlate to grades, skills and competencies, instructor perceptions, peer pressure and in non-traditional or career-oriented students, opportunities to network for career growth. Shared leadership may feel risky among

students who are goal-oriented and dominant and they may feel reluctant to share the leadership role among less skilled team members.

The transient nature of virtual teams in online programs where students feel isolated and rarely share more than one course with their fellow students may not develop the level of trust and respect needed to be comfortable sharing the leadership role amid a class full of strangers.

In an online game, it is very motivating to have a shared enemy and a life or death conflict. While the answer is not to expand the perception of criticality in virtual team behavior and group outcomes, engaging problems and activities are motivating factors for future virtual team work.

Virtual teams in online courses can benefit from shared leadership, and one way to nurture these learning opportunities is to offer incentives for cooperative teamwork and shared leadership. These teams also benefit from improved social networking tools, voice communication tools and related technologies that support collaborative work.

Further research is needed to identify better ways to leverage shared leadership and to measure its benefits and potential drawbacks vs. the desired outcomes, the quality of the team experience and in its relationship to learning analytics and how improved team experiences and opportunities to develop leadership skills benefit future teamwork, the exploration of ideas and team productivity.

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