

Leading to Win: The Influence of Leadership Styles on Team Performance during a Computer Game Training

Anna Siewiorek, Andreas Gegenfurtner, Centre for Learning Research, University of Turku, Finland
Email: amsiew@utu.fi, angege@utu.fi

Abstract: The purpose of this study is to examine how leadership styles will influence the team performance during a computer game training. In order to get a better understanding what leadership styles are going to be distinguished, researchers observed students' interactions while they played a strategic computer game. In the study, a group of Stanford University graduate students participated in the training with a 'real estate' computer game. The participants' task during the game was to manage an estate company in small teams. Students developed goals, discussed problems and tracked progress in order to win the game. The results showed that the teams had different leadership styles which affected their performance. The leadership styles that participants used and how they affected the teams' performance are described in the paper.

Introduction

Increasingly, employers are demanding that college graduates have integrative skills (Stephen, Parente, & Brown, 2002) for an interdisciplinary understanding of the organization and business dynamics (Hartenian, Schellenger, & Frederickson, 2001). However, methods and tools commonly used for teaching this business dynamic in colleges are insufficient to cope with the complexity of organizations and the unstable conditions of today's market (Baker & O'Neil, 2002; Day, 2001; Lehtinen, 2002). Especially, it is difficult to teach leadership—a central competence for coping with these kinds of conditions—using traditional classroom-based methods of teaching (e.g., lectures). One solution for that problem is to teach about leadership styles through strategic computer games. Thus, more studies need to be conducted about the ways of teaching leadership styles in practice. It would be especially interesting to study how leadership styles influence team performance during computer gaming training. Previous studies have demonstrated significant linkages among leadership behavior, team efficacy, and team performance (Pescosolido, 2001). However, there has been a lack of integration concerning the relationship between specific leader behaviors and team performance outcomes (Burke et al., 2006).

This paper describes serious gaming session that aimed to teach students about business dynamics and about leadership styles i.e., which leadership style should be used in a specific situation to manage similar situations in their future workplace. Past studies have shown that serious games can successfully foster student learning (Kafai, 2006), engagement (Kiili & Lainema, 2008), and motivation (Hense & Mandl, 2009). It is worth noting that there is an evidence to suggest that playing games allows the brain to 'work' more efficiently and thus, to take in more cognitive material than it would in a more traditional setting (Jenkins, 2002; Perry & Ballou, 1997). In addition, games can be considered as powerful learning environments because of the following: (a) they are based upon active-learning techniques, (b) they favor activation of prior knowledge given that players must use previously learned information in order to advance, (c) they provide immediate feedback enabling players to test hypotheses and learn from their actions, (d) they encompass opportunities for self-assessment through the mechanisms of scoring and reaching different levels, and (e) they provide opportunities for critical thinking and problem solving skills (Oblinger, 2004). Furthermore, few examples of using simulation games to develop leadership skills can be found in the military sector (O'Neil & Fisher, 2004). The military sector also uses simulation-based games in flight and combat training (O'Neil & Andrews, 2000). For this study, a strategic computer game, "Build-a-lot" (see Appendix), was used in which players met face-to-face in small teams to manage a virtual real estate company. Participants collaborated in teams in order to win the game, and group work helped them to share and develop alternative viewpoints. Furthermore, the use of teams to promote student learning in education has been proven to be fruitful (Michaelsen, Bauman Knight, & Fink, 2004). For example, in Light's study (2001) of student learning at Harvard, he found student learning teams to be highly effective. On the contrary, small group research has identified a number of factors that negatively affect team performance and member satisfaction. These include over-dependence on a dominant leader (Edmondson, Bohmer, & Pisano, 2001).

The computer game used for the study presented an enormous amount of complex operations in which a team leader needed to address the final decision to lead the team to win the game. This kind of computer game, involving many complex decisions, can connect the players to everyday life experiences. In addition, the time pressure in the game was crucial, and participants had to make decisions quickly in order to advance to the next level. The speed of the game was fast, and only quick decision-making could lead teams to win the game. This gaming environment was interactive, and participants interacted by solving the given tasks in the game.

Therefore, strategy and an appropriate leadership were needed in order to be successful. Furthermore, the training was competition-based and that also required implementation of leadership skills. The research questions were as follows: 1) what leadership styles (if any) could be distinguished during the computer game, and 2) how have leadership styles influenced team performance during the game?

Leadership styles

Most definitions of leadership claim that it is a process of intentional influence by one person over others “to guide, structure, and facilitate activities and relationships in a group or organization” (Yukl, 1998, p. 3). In other words, leadership is defined in terms of problem-solving activities directed at the generation of solutions that advance team goal attainment (Zaccaro, Rittman, & Marks, 2001). Leadership is typically associated with more mystical, charismatic qualities such as the ability to influence, arouse, inspire, enthuse, and transform (Bass & Avolio, 1994; Goleman, 2000), qualities that exist outside of the ordinary and mundane features of daily life. Additionally, leadership is frequently theorized as the exercise of power, the setting of goals and objectives, the managing of cultures, and the mobilization of others to get work done (Alvesson & Sveningsson, 2003; Gemmill & Oakley, 1992). In addition, leadership has been defined in terms of individual personality traits, leader behaviors, responses to leader behaviors, interpersonal exchange relationships, interaction patterns, role relationships, follower perceptions, task goals, organizational culture, and nature of work processes (Mello, 2003; Rost, 1991; Yukl, 1989). Hence, leadership is an important component in business dynamics. Below, we specify four leadership styles in more details: transactional, transformational, heroic, and post-heroic leadership.

First, transactional leadership is characterized by the clear specification of what followers are expected to do (e.g., Bryman, 1996) and it is based on a rational exchange relationship between leader and subordinate (Bass, 1985; Howell & Costley, 2001). The leader articulates what behaviors are required and what will be rewarded, and provides feedback to the subordinates about their behaviors. The subordinate, in turn, complies with these behavior requirements if rewards are desired (Yun, Cox, Sims, & Salam, 2007). In short, transactional leadership can be defined as a cost-benefit exchange between leaders and their followers and it is comprised of three dimensions: contingent reward, active management by exception, and passive management by exception.

On the other hand, transformational leadership is characterized by concern with people. Transformational leaders lead by inspiring and stimulating followers; by creating highly absorbing and motivating visions; and by utilizing behaviors such as charisma and intellectual stimulation to induce performance of subordinates beyond expectations (Conger, Kanungo, & Menon, 2000; Kark, Shamir, & Chen, 2003; Yun et al., 2007). Bass (2000, p. 21) states that transformational leaders “move followers to go beyond their own self-interests for the good of their group, organization or community, country or society as a whole”. Transformational leadership is comprised of the following dimensions: idealized influence, inspirational motivation, charismatic and intellectual stimulation, and individual consideration.

Third, heroic leadership is characterized by the following: feelings that leadership is based on superior knowledge and information (omnipotence); fearing failure (rightness); keeping up appearances at any cost including blaming others (face-saving); and viewing subordinates as inferior creatures in constant need of assistance and rescue (codependency) (Eicher, 2006). Two sub-classes could be distinguished in heroic leadership such as: autocratic and coercive leadership styles which have many similarities. The autocratic leader sequesters a high degree of control and makes decisions without consulting team members. The heroic-autocratic leader determines all policies, techniques, and activity steps, and dictates the particular work tasks and work companions of each member. The autocratic leader tends to be personal in her praise and criticism of the work of each member but remains aloof from active group participation (Choi, 2007). On the other hand, in coercive leadership style leader demands immediate compliance and drive to achieve, initiative, and self-control (Goleman, 2000).

Finally, post-heroic leadership takes place when the leader wants others to take responsibility and gain knowledge (empowerment), encourages innovation and participation even in ambiguous situations (risk-taking), seeks input and aims for consensus in decision-making (participation), and wants others to grow and learn even at the expense of becoming dispensable herself (development). Post-heroic leadership has thus become a concept used to describe a new conceptualization of leadership that refutes the top-down focus on the leader typical of most leadership literature and discourse (Bradford & Cohen, 1998; Eicher, 2006; Fletcher, 2004). This leadership style is well-suited to complex, changing, and inter-dependent environments. There are two sub-classes in post-heroic leadership: democratic and shared leadership. First, democratic leadership style emphasizes high group participation, discussion, and group decisions based on consensus encouraged by the leader. By giving workers a voice in decisions, democratic leaders build organizational flexibility and responsibility and help generate fresh ideas. In addition, because they have a say in setting their goals and the standards for evaluating success, people operating in a democratic system tend to be very realistic about what can and cannot be accomplished (Goleman, 2000). Second, shared leadership occurs when all members of a team are fully engaged in the leadership of the team and are not hesitant to influence and guide their fellow team

members in an effort to maximize the potential of the team as a whole (Pearce, 2004). In summary, shared leadership represents teams whose members are empowered to share the tasks and responsibilities of leadership (Ensley, Pearson, & Pearce, 2003; Katzenbach, 1997).

Methods

In order to get a better understanding of how leadership styles will affect team performance during computer game training, three researchers observed students' interactions when they were playing a strategic computer game called "Build-a-lot" (see Appendix). Researchers were taking detailed notes of all student dialogs and actions; each researcher had one team to observe and take notes of their interactions and dialogs. The goal of this observation was to determine what leadership styles (if any) students are going to use during the game and how this styles will affect team performance. All notes that researched made were transcribed verbatim. For the purpose of data analysis the detailed codes were developed which described each leadership style characteristics. The notes (i.e. each team dialogs and interactions) were coded using those leadership styles characteristics. Nine participants took part in the gaming session. They were divided into three teams, which competed against each other for one hour. Final scores of the game determined which team won. During the game, students made many decisions related to running a real estate company. Due to the game's limited time, the participants became focused during the gaming session and were thoroughly engaged and immersed in the game. The time pressure increased the speed of their decision-making. The gaming session took place at Stanford University, California, USA in the autumn semester of 2007.

Participants

Nine participants took part in the study (two females and seven males). They were Stanford University graduate students from different academic backgrounds such as engineering and humanities. The participants in the teams did not know each other. There were three teams with three participants in each team. They did not consider themselves experienced users of computer games. The study was the first in which all of them took part in a gaming session. During the experiment, participants worked together in teams because only in teams could leaders be distinguished. Participants were unaware of the purpose of the study.

Description of the game and setting

Participants played "Build-a-lot" (see Appendix) in teams. Players represented real estate moguls whose task was to take over the housing market as they build, upgrade, sell, and buy houses for huge profits. The purpose of the gaming session was to teach students business dynamics, how to make decisions quickly. Their goal was to win the game; the team with the most profit and the highest achieved level won the game. From time to time, a message from the Mayor (of the city in which they were building houses) appeared on the computer screen with hints or tasks about the game. If a team managed to get every operation correct, they passed the level in the game and advanced to the next level. If a team failed a level in the game, they had to repeat that level from the beginning. Every team had one notebook computer to use along with a computer mouse. The teams played simultaneously for one hour. During the experiment, there were three researchers to observe the teams; each researcher had one team to observe. Researchers introduced the game to participants at the beginning and told them that they could look for help and instructions in the tutorial section in the game, but they could not ask the observing researchers any questions. Team members could ask questions of other teams. The aim of the researchers was to observe students' interactions while playing the game (how they collaborated, how they made decisions, etc.) and to make detailed notes of all their dialogs and students interactions.

Data Analysis

The main aim of the study was to research how leadership styles which participants applied during the gaming session will influence the teams' performance. The method of data analysis was discourse analysis (Silverman, 2006). After reading through the transcripts of notes from observations and students dialogs, the transcripts were coded in terms of transactional, transformational, heroic and post-heroic leadership styles. These developed categories of leadership styles (each had subcategories referring to the given leadership style characteristics) were used to analyze the data.

Results

The conclusion drawn from the observations is that the teams had different leadership styles, which affected their performance. The following three sections describe each team's leadership style and how it influenced performance and the game results.

Team 1.

The leadership style of Team 1 could not be described as one leadership style. The leader of this team applied different leadership styles such as transformational, heroic, as well as post-heroic leadership styles. In this team

there was an accountable leader who had superior knowledge; all wisdom was concentrated in him, and he displayed a sense of power and confidence. The leader knew what actions to take during the game, although he has not played that game before. He possessed superior knowledge which helped him to make the right decisions. The dialog below is an example of participant 2 (the leader's) omnipotence:

Participant 1: 'Do we need to train (workers)?'

Participant 2: '*Yes, but it is too expensive.*' (He is upgrading houses)

Participant 1: 'How about (if) we build this one?'

Participant 2: '*Maybe not... we have to make more money.*'

Participant 2 knew what to do in this situation, and he determined his teammates' opinions to be less valuable at this point. In the dialog above, even if participant 1's opinions were turned down by the leader, he agreed with it without insisting on his opinions and without trying to persuade participant 2, which could suggest that participant 2 (the leader) was respected for his knowledge and rightness. This behavior could be described as an idealized influence which is a characteristic of transformational leadership – leaders are admired, respected and trusted. At the same time, the leader of this team applied intellectual stimulation to manage his team. During the competition, participant 2 was the leader who controlled the mouse, read aloud game instructions, and tried to generalize the guidelines for the team. There were several times when two other team members brought up questions, and he answered them very quickly. Although he controlled the mouse during the whole process, he often asked his team members opinions before implementing ideas; hence, team members were included in the process of addressing problems and finding solutions. They participated in making some of the decisions, such as what to do next, but they depended on their leader to make the final decision. Thus, the leadership style was democratic and leader-centered at the same time. Group participation and discussion was encouraged by the leader. Below is an example:

Participant 2: 'Do you want a workshop?', then, he explains, 'the strategy of this level is to build a house and get cash, and you need to build a library.'

Participant 3: 'We need more training.'

Participant 2: 'Oh, mail! That's good.' (He opens the mail, team members look at the screen), then he asks: 'how do you feel about an upgrade?'

From the dialog above, it could be noted that participant 2 asked for his teammates' opinions because probably he wanted to share the responsibility. Thus, the leadership style present in this team could be interpreted as shared leadership also. The leader shared his leadership to some degree with the team members; he asked them what they think should be done next and waited for their agreement to proceed further. However, this kind of leadership does not always have a good influence on team performance. Sometimes leaders cannot make any decision without getting input from their team members. This slows down the process and the organization cannot react quickly enough. In this team, participant 2 was often asking his team members for opinions (although not all of their ideas were adopted and implemented) that helped him to lead the team to win the game. The best leaders favor participation, but also know when they need to be directive or make decisions on their own. According to Lingham (2004), teams with high dependence on a single leader had lower performance, less member satisfaction, and a decreased climate of psychological safety. The dependence on a single leader could be observed in Team 1; however, in the case of this team, team members did not show the aforementioned attributes. Overall, there was no conflict in the team during the playing the game. Everyone seemed to be content with the decisions participant 2 made, and the atmosphere of the team was harmonious. Team members were satisfied with the leadership styles the leader implemented. In summary, leadership techniques used by the leader brought success to the overall team performance; this team won the game competition.

Team 2.

This team's leadership style could be described as heroic leadership and to some degree as a post-heroic leadership. Disagreements in this team came from the fact that one participant dominated and was pushing other team members to realize his ideas. It could be noted from observations of this team that he was behaving like a heroic-autocratic leader. He issued orders and he expected them to be followed without questions. He wanted to determine all activity tasks and steps. A high degree of control is a main characteristic of the autocratic leadership style. He wanted to win the game and he was concentrated more on the game performance than on his team members' satisfaction and their opinions. The example of participant 4's autocratic leadership style can be noted in the dialog below:

Participant 5: 'What should we do?'

Participant 4: 'We buy houses later, buy one Tudor, we can sell it later.'

Participant 6: 'Colonial first.' (He meant colonial buildings)

Participant 4: 'No, definitively don't do it, buy Tudor. Better to build the Tudor. *Listen to me!*'
(Participant 6 was against that)

Participant 4: 'Sell a Tudor and buy this one of a higher price, *listen to me!*'

In addition, coercive leadership styles could be noted from his behavior as he demanded immediate compliance. This leadership style is the least effective. It is appropriate during an emergency or crisis situation, and when used in the short term, but it is not successful in the long term. In this leadership style, team members do what they are told because they fear being reprimanded. As a result, team members are easy to manage and the leaders have all the control. Unfortunately, team members feel burdened to question ideas and make suggestions, which prevent good ideas from being heard. Another downside involves team members never deviating from their leaders' orders, even if they do not agree with the orders. When participant 4 was behaving like a demanding leader who gives orders to team members, they disliked it. During the game, they were willing to collaborate with each other more, but not with participant 4. They were not satisfied with participant 4's attitude towards them and the game competition. However on the contrary, highlights of shared leadership style could be noticed from this team conversations. From time to time there was mutual influence between the team members. In particular, the female participant was asking two other members' opinions and encouraged them to exchange ideas. She had the mouse in her hand during the game's competition, and she was trying to discuss with others all decisions she was about to take. The two other participants were expressing their opinions to her, and she was implementing what she had been told to do. In general, all team members tried their best to win the game, and ideas were coming from every team member. They always tried to help each other by expressing opinions and comments. Here is a note from the observations showing highlights of shared leadership style and mutual influence in this team: participants 4 and 5 had an idea of buying a house, and participant 6 commented as follows:

Participant 6: 'Not buy, let's build a house.'

(They listened to his comment and constructed the house)

Participant 4: 'We can sell it later.'

Participant 6: 'No, let's sell it now.'

Participant 5: 'We'll sell it when we don't have money...'

Based on the results of the study, the mix of leadership styles implemented in this team cannot lead the team to be successful and to achieve high performance. Team 2 was the second team to finish the game, and perhaps this was due to one participant's coercive leadership style which was not effectively implemented within the team. In addition, team members were not satisfied with participant 4's dominant influence.

Team 3.

In this team, no clear leadership style could be distinguished, however collaboration could be noted from the team's dialogs but nobody in this team wanted to have a leadership responsibility nor did anyone have a personality with which to influence others. Leadership involves influence; without influence, leadership does not exist. This team's way of playing the game lacks clearly distinguished leadership style, although highlights of shared leadership could be noted in the team's conversations. This team's game score was the lowest, so they lost the game competition. In general, the lack of leadership could be explained by the "official leader" being not present – physically or mentally. Most of the time, team members want to have their leaders to direct, inform, or give them feedback. Thus, when the team has no leader, the team's potential is hindered. In addition, most team members want to feel a connection to their team; however, without the leader, there is no organization, but rather chaos. See the note from the observations below as an example of Team 3's lack of organization:

Participant 8: 'We have to build it. How many do we have to build? 75? We're out of materials. So what's next? Do we have additional instructions? Or just make more money?'

Participant 7: 'We keep making money.'

Participant 8: 'Our strategy is to make money, right?' (Silence, nobody answered the question)

From the dialog above, one could notice uncertainty of what they have to do. Later, during the game, when one team member was trying to organize the structure of the team, other team members did not consider that to be necessary. See the dialog below as an example:

Participant 7: 'We have to buy a house. Raise income.' (Spoke louder)

(Team members moved forward to read the game instructions)

Participant 8: 'We don't have enough money'.

Participant 9: 'Materials.'

Participant 8: 'OK, now each of us should be in charge of one job.'

Participants 7 and 9 laughed and nodded their heads.

(They almost developed the strategy but without a success)

Participant 7: 'Buy a house to raise income. We need to buy or construct.' Then he adds: 'Time is running out...'

In this team, nobody had authority or an answer to the questions other team members were asking. Furthermore, nobody wanted to be responsible and everyone was making suggestions. Nobody demonstrated a tendency to dominate this team and to be a leader. Also, nobody's opinion was respected or considered to be important, they avoided getting involved when important issues aroused. They usually made a decision based on a situation rather than a person. This team did not respond to situations and problems systematically. The team cannot have successful performance without a leader who has the authority to make decisions. A team needs a leader to organize its structure and to successfully lead team members in a complex environment. This team leadership could be described as *laissez-faire* and team's behavior could be described as passive/avoidant behavior. The "passive leaders" avoid specifying agreements, clarifying expectations, and providing goals and standards to be achieved by followers. This style has a negative effect on desired outcomes and has negative impacts on followers and associates. Therefore, the lack of a leadership role in this team probably caused them to lose the game competition and have the lowest score. These results provide added support for prior research that has shown the use of managing-by-exception (*laissez-faire*) to be an ineffective leadership style (Avolio, Waldman, & Einstein, 1988).

Discussion

The main concern of the study was to research how leadership styles will affect the team performance during a computer game training. As a result of the game competition, Team 1 won the game. The leader of this team used different leadership styles such as transformational: shared and democratic leadership styles. The best leaders do not just use one style of leadership – they are skilled at several, and have the flexibility to switch between styles as the circumstances dictate (Goleman, 2000). In the case of Team 1, the transformational leadership and the dependence on a single leader (leader-centered style) resulted in effective team performance. However, the leader-centered leadership style is hardly used alone in today's organizations. One leader alone is not enough in today's complex work environment. It is becoming more difficult for any one person to be an expert in all aspects of the work that needs to be done. In fact, research indicates that poor-performing teams tend to be dominated by the team leader, while high-performing teams display more dispersed leadership patterns, i.e., shared leadership (Pearce, 2004). Shared leadership is a complex process, but it was successfully implemented in Team 1. In this team, the role of the heroic leadership was implemented with shared and democratic leadership styles that made a positive impact on the team performance. On the contrary, in Team 2 shared leadership implemented with autocratic and coercive leadership styles did not bring effectiveness to the team performance. The leader's personality was too strong and his demanding attitude towards other team members had a negative influence on the team members and the team performance. He wanted to direct and control all decisions without any meaningful participation by the team members. With this leadership style, it has been found that most of the decisions made lack in creativity. Although shared leadership was applied in Team 2, it did not help to win the game. In Team 3, there was no clearly distinguished leadership style which probably caused them to lose the game. Team members demonstrated a failure to take responsibility for managing and decision-making. No one in this team provided direction or support; rather, they showed a lack of caring for their team's performance. This 'non-leadership' style could be described as *laissez-faire* leadership, a principle which emphasizes independence. So, team members are left alone to do their work with little direction or supervision. The conclusion from these results is that leadership is needed for successful team performance.

According to Brousseau, Driver, Hourihan, & Larsson (2006), in order to advance in complex organizations, leaders need to learn and apply more advanced decision styles for using information and evaluating options. It was found that leader decision styles must evolve to include more complex information processing that are capable of managing the challenges of a turbulent environment. Today's organizations are more complex than they used to be, and traditional, heroic leadership styles, when used alone, are not enough to be successful. Therefore, teaching leadership should change as well. One approach to teach leadership is by playing a strategic computer game in teams. Teaching with computer games could prepare students to better cope with business world complexity. Gaming sessions as described in the paper could be implemented in college business education to teach students which leadership styles should be used in a specific situation to manage similar situations in their future workplaces. Classes based on organizing training sessions with strategic computer games to teach leadership styles have two advantages. First, students experience how they behave in pressure situations (competition, time pressure, etc); these situations push them to be more successful and creative or they cause them to drop out without caring about actively participating in the training session. Second, they see which team wins the game, attempt to interpret the game results, and come to the conclusions as to why their team performance was not effective if their team lost. This type of experience teaches students how to behave in certain situations and how the competition affects their behavior. After the gaming session,

they will realize from the experience which type of leadership styles work well and how to behave next time when placed in a similar situation. However, not everyone has a predisposition to being a leader; a particular personality type is usually needed. People who have a 'leader personality' could be trained to be better leaders and training such as the type mentioned in this study could help them to develop strategies on how to be more successful. In summary, playing a strategic computer game in teams of three could provide the tool to learn applying different leadership styles in different situations.

The interesting area for future inquiry would be to organize leadership training sessions in which participants play in more than one team. In this way, they will have an opportunity to experience different leadership styles with different team members. It would be fruitful for the game participants to conduct interviews with them after the training and evaluate the leadership styles they have experienced. This kind of debriefing could help participants to articulate what they have learned for the purpose of knowledge building (Jonassen, Peck, & Wilson, 1999).

References

- Alvesson, M., & Sveningsson, S. (2003). 'Managers doing leadership: The extra-ordinarization of the mundane'. *Human Relations*, 56(12), 1435-1459.
- Avolio, B. J., Waldman D. A., & Eisten W. O. (1988). Transformational leadership in a management game simulation. Impacting the bottom line. *Group & Organization Studies*, 13(1), 59-80.
- Baker, E. L. & O'Neil, H. F., Jr. (2002). Measuring problem solving in computer environments: current and future states. *Computers in Human Behavior*, 18, 609-622.
- Bass, B. M. (1985). *Leadership and performance beyond expectations*. New York: Free Press.
- Bass, B. M. (2000). The future of leadership in learning organizations. *The Journal of Leadership and Organizational Studies*, 7(3), 18-40.
- Bass, B. M., & Avolio, B. (1994). *Improving organizational effectiveness through transformational leadership*. Thousand Oaks, CA: Sage.
- Bradford, D. L., & Cohen, A. R. (1998). *Power up: Transforming organizations through shared leadership*. Chichester, England: Wiley.
- Brousseau, K., Driver, M., Hourihan, G., & Larsson, R. (2006). The seasoned executive's decision-making style. *Harvard Business Review*, 84(2), 111-121.
- Burke, C. S., Stagl, K. C., Klein, C., Goodwin, F. G., Salas, E., & Halpin, M. S. (2006). What type of leadership behaviors are functional in teams? A meta-analysis. *Leadership Quarterly*, 17, 288-307.
- Bryman, A. (1996). Leadership in organizations. In S. R. Clegg, C. Hardy & W. R. Nord (Eds.), *Handbook of organization studies* (pp. 276-292). London: Sage.
- Conger, J. A., Kanungo, B. N., & Menon, S. T. (2000). Charismatic leadership and follower effects. *Journal of Organizational Behavior*, 21, 747-767.
- Day, D. V. (2001). Leadership development: A review in context. *The Leadership Quarterly*, 11, 581-613.
- Edmondson, A. C., Bohmer, R. M., & Pisano, G. P. (2001). Disrupted routines: Team learning and new technology implementation in hospitals. *Administrative Science Quarterly*, 46, 685-716.
- Eicher, J. P. (2006). *Post-heroic leadership: Managing the virtual organization*. Retrieved October 20, 2009, from <http://www.pignc-ispi.com/articles/management/post-heroic.htm>
- Ensley, M. D., Pearson, A., & Pearce, C. L. (2003). Top management team process, shared leadership, and new venture performance: A theoretical model and research agenda. *Human Research Management Review*, 13, 329-346.
- Fletcher, J. K. (2004). The paradox of postheroic leadership: An essay on gender, power, and transformational change. *Leadership Quarterly*, 15, 647-661.
- Gemmill, G., & Oakley, J. (1992). Leadership: An alienating social myth? *Human Relations*, 45(2), 113-129.
- Goleman, D. (2000). Leadership that gets results. *Harvard Business Review*, 78(2), 78-90.
- Hartenian, L. S., Schellenger, M., & Frederickson, P. (2001). Creation and assessment of an integrated business course: One college's experience. *Journal of Education for Business*, 76(3), 149-159.
- Hense, J., & Mandl, H. (2009, August). *Learning with digital games: Potentials and best practice in the light of theories of learning, emotion, and motivation*. Paper presented at the 13th EARLI Conference, Amsterdam.
- Howell, J. P., & Costley, D. L. (2001). *Understanding behaviors for effective leadership*. Upper Saddle River, NJ: Prentice Hall.
- Jenkins, H. (2002). Game Theory: Digital Renaissance, *Technology Review*. MIT. March 29, 2002.
- Jonassen, D. H., Peck, K. L., & Wilson, B. G. (1999). *Learning with Technology: A Constructivist Perspective*. Upper Saddle River, NJ: Merrill/Prentice Hall.
- Kafai, Y. B. (2006). Playing and making games for learning: Instructionist and constructionist perspectives for game studies. *Games and Culture*, 1, 36-40.

- Kark, R., Shamir, B., & Chen, G. (2003). The two faces of transformational leadership: Empowerment and dependency. *Journal of Applied Psychology*, 88, 246-255.
- Katzenbach, J. R. (1997). The myth of top management team. *Harvard Business Review*, 75(6), 82-91.
- Kiili, K., & Lainema, T. (2008). Foundation for Measuring Engagement in Educational Games. *Journal of Interactive Learning Research*, 19, 469-488.
- Lehtinen, E. (2002). Commentary. Developing models for distributed problem-based learning: Theoretical and methodological reflection. *Distance Education*, 23(1), 109-117.
- Light, R. J. (2001). *Making the most of college: Students speak their minds*. Cambridge, MA: Harvard University Press.
- Lingham, T. (2004). *Developing a measure of conversational learning spaces in teams*. Unpublished doctoral dissertation, Case Western Reserve University, Cleveland, OH.
- Mello, J. A. (2003). Profiles in leadership: Enhancing learning through model and theory building. *Journal of Management Education*, 27(3), 344-361.
- Michaelsen, L., Bauman Knight, A., & Fink, L. D. (2004). *Team-based learning: A transformative use of small groups in college teaching*. Sterling, VA: Stylus.
- Oblinger, D. (2004). The next generation of educational engagement. *Journal of Interactive Media in Education*, 8, 1-18.
- O'Neil, H. F., Jr., & Andrews, D. H. (2000). *Aircrew training and assessment*. Mahwah, NJ: Lawrence Erlbaum Associates, Inc.
- O'Neil, H. F., Jr., & Fisher, Y. C. (2004). A technology to support Leader Development: Computer Games. In D. V. Day, S. J. Zaccaro, & S. M. Halpin (Eds.), *Leader development for transforming organizations: growing leaders for tomorrow* (pp. 99-121). Mahwah, NJ: Lawrence Erlbaum Associates, Inc.
- Pearce, C. L. (2004). The future of leadership: Combining vertical and shared leadership to transform knowledge work. *Academy of Management Executive*, 18(1), 47-57.
- Perry, E. L., & Ballou, D. J. (1997). The role of work, play, and fun in microcomputer software training. *ACM SIGMIS Database*, 28(2), 93-112.
- Pescosolido, A. T. (2001). Informal leaders and the development of group efficacy. *Small Group Research*, 32, 74-93.
- Rost, J. (1991). *Leadership for the twenty-first century*. Westport, CT: Praeger.
- Silverman, D. (2006). *Interpreting Qualitative Data: Methods for Analysing Talk, Text and Interaction* (3rd ed.). London: Sage.
- Stephen, J., Parente, D. H., & Brown, R. C. (2002). Seeing the forest and the trees: Balancing functional and integrative knowledge using large-scale simulations in capstone business strategy classes. *Journal of Management Education*, 26(2), 164-193.
- Yukl, G. (1989). Managerial leadership: A review of theory and research. *Journal of Management*, 15, 251-289.
- Yukl, G. (1998). *Leadership in organizations* (4th ed.). Upper Saddle River, NJ: Prentice Hall.
- Yun S., Cox J., Sims, H. P., Jr., & Salam S. (2007). Leadership and Teamwork: The Effects of Leadership and Job Satisfaction on Team Citizenship. *International Journal of Leadership Studies*, 2(3), 171-193.
- Zaccaro, S. J., Rittman, A. L. & Marks, A. M (2001). Team leadership. *The Leadership Quarterly*, 12, 451-483.

Appendix

Build-a-lot – a strategic computer game, where players are real estate moguls whose task is to take over the housing market as they build, upgrade, sell and buy houses for huge profits. The objective of the game is to get Net Value to the highest possible number by building, upgrading and selling properties. The team with the most profit and the highest achieved level wins the game. If the players manage to get every operation correct, they pass the current level in the game and advance to the next level. If a team fails a level in the game, they have to repeat that level from the beginning. During the game, players get the instructions from the mayor of the city in which they are building houses. To construct a property, players must have the blueprint, enough workers and enough materials. The players' task is to move from one town to another to improve them and achieve all the goals in a given period of time. They are asked to build different kinds of houses and buildings, earn a specific rental income, or earn cash. To achieve these goals, players have to choose exactly what they have to build and demolish, which requires certain calculations. Players can build the following kinds of houses: Rambler, Colonial, Tudor, Estate, Mansion, and Castle. They should buy the blueprint of each of these, the materials needed, and a certain number of workers. They can also build a number of buildings like a Post office, Library, Workshop, Bank, Sawmill, etc. The main advantage of this game is the fact that it makes players think and calculate items (for example, taxes that they should pay) in order to win. In this environment, participants played in teams, with three members on each team. Game play with small teams forces team members to express and exchange their ideas and opinions to form a strategy. Furthermore, teams are indispensable for successful performance, and individuals have to be trained to be able to work efficiently and effectively in groups.