The Role of Time, Engagement, and Self-Perceived Leadership on Peer-Nominated Emergent Leadership in Small Group Online Collaborative Learning

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Abstract: The study investigated the nature of leadership emergence in small group online collaborative activities. The study tested the effects of time, engagement, and self-perceived leadership on peer-nominated leadership. Results indicated that emergent leadership perceived by peers in a group not only required individuals' active engagement and self-perception of their leadership role, but also required the leadership to be developed over time. High levels of perceived task leadership and active engagement would lead to more likelihood for individuals to be perceived by peers as emergent leaders in a group. Qualitative analysis revealed that quality of posts, active facilitation, quantity and diversity of posts, significant contribution, initiation of interaction, and motivating promotion were primary characteristics of emergent leaders.

Keywords: emergent leadership, small group online learning, collaborative learning

Introduction

Leadership roles often emerge in group-learning activities, where students commonly take different social roles in the process of completing collaboration tasks (French & Stright, 1991). The emergence of leadership is a social process during which individuals with no formal authority become leaders (Neubert & Taggar, 2004). Emergent leadership plays a crucial role of the success of small group collaborative learning activities. Members of the group can lead different aspects of the collaborative learning process. For example, one member can facilitate communications among team members; another person may mediate to resolve conflicts. Gressick and Derry (2010) found that leadership did emerge and was distributed among group members in online collaborative learning activities. Li and colleagues (2007) found emergent leaders led in various means such as turn management, argument development, planning and organization, topic control, and acknowledgement. Particularly in online learning settings, however, questions, such as "How does leadership emerge in small group collaborative learning? Why do some individuals become emergent leadership while others do not? What are the determining factors for individuals to become emergent leaders? What is the dynamic process of leadership formation in small group learning?" remain unanswered. There has been limited research on what the nature of leadership emergence is in authentic classroom group learning activities (Edwards, 1994; Gressick & Derry, 2010; Yamaguchi, 2001).

Traditional leadership research has often conceptualized emergent leadership as outward characteristics and behaviors that can influence the entire group (e.g. Yukl, 1989; Carte, Chidambaram, & Becker, 2006). Leaders may regulate team members' performance and provide rewards, caring, motivation, and intellectual stimulation to others (Avolio, 1999; Bass, 1998; Gibson & Vermeulen, 2003). Leaders can promote group cohesiveness by managing the task or fostering a positive group environment (Huang, et al., 2010). They also monitor task progressions, direct group interactions, and resolve conflicts among group members (Wakefield, Leidner, & Garrison, 2008).

Emergent leadership also may be viewed as an inner perception of person's social status within the group, which often can (a) be represented through individuals' perception of leadership of themselves, and (b) be seen as a common perception of social roles by peers in the group. *Self-perceived leadership* is an inner perception of self in respect to the social status within the group (Avolio & Gardner, 2005; Hall, 2004). Two types self-perceived leadership include *task leadership* that deals with task accomplishments such as initiating structures and monitoring the process of the task, and *relational leadership* that facilitates team interactions such as maintaining closed relationships, and empowering and motivating group members (Burke et al., 2006; Yamaguchi & Maehr, 2004). *Peer-nominated leadership* reflects how members perceive others' leadership role within the group. It often features characteristics such as competence, popularity, reputation, and authority (Avolio & Gardner, 2005; Bass, 1998). For example, with or without official leadership appointment, individual members could perceive themselves as leaders and others as followers in particular contexts or tasks. On the other hand, they could perceive others as leaders and themselves as followers.

Therefore, three facets of leadership in group-learning setting include outward characteristics and behaviors – engagement, self-perceived leadership, and peer-perceived leadership. These facets may dynamically influence each other during a group learning process. Leadership research literature suggests that self-perceived leadership may lead to the demonstration of active behaviors (engagement) with significant influences on learning performance (Kahai, Sosik, & Avolio, 1997; Carte, Chidambaram, & Becker, 2006; Gressick & Derry, 2010). Limited extant research further suggests that active learning engagement would help students to gain popularity and possibly would lead to establish a leadership status perceived by other members in a collaborative group (Xie, Yu, & Bradshaw, 2014). In addition, research suggests that the development of social status in collaborative learning groups is a gradual and continuing process that requires to be evolved over time. For example, Tuckman (1965, 1977) proposed that group development often goes through five stages of forming, storming, norming, performing, and adjourning. Xie, Miller, and Allison (2013) found that social relations in an online group learning community often go through multiple weaves of progressive development. These research findings lead us to believe that the development of emergent leadership could be a dynamic process where time, engagement, self-perceived leadership and peer-perceived leadership interact with each other and evolve among the members within a learning group.

In this paper, we report an investigation on how students' engagement and self-perceived leadership influenced their peers' perception of emergent leadership over time in a small group online collaborative learning setting. The following research questions guided the design of this study, conducted in an online collaborative learning setting:

1. Do time, engagement, and self-perceived leadership have an effect on peer-nominated leadership?
2. How do engagement and self-perceived leadership influence peer-nominated leadership over time?
3. What are the qualitative characteristics do students report to describe the peer-nominated leaders?

Methods

Participants and context

The study involved undergraduates who were taking an elective online study-strategies course at a large public university in the Midwest United States during spring 2013. In total, 170 students from six sections of the course participated. Participants were 63% White, 8% African American, 8% Asian, and the remainder 21% was of other racial backgrounds. The distribution of gender was roughly equal, with males (42%) and females (49%). 9% of students did not report their gender. In terms of college experience, 13.6% were first-year students, 26.5% were sophomores, 20.6% were juniors, and 31.8% were seniors. 7.5% of students did not report their grade level. Students participated in five collaborative online discussions addressing the topics of note taking, reading, studying, presentation skills, and resilience. Students worked in groups of 5-7 in the discussions, which provided a forum for brainstorming ideas and coordinating process. Each discussion portfolio provided specific instructions and grading criteria, which covered expectations of both quality and quantity of the online discussion posts. At end of each week, students in a group were asked to nominate a group leader and provided the rational for their nominations. To provide insight into students' perceived leadership, students also completed a confidential online survey at the end of the semester. Students provided consent for the use of their coursework and survey responses for this research study.

Measures

Measures of this study include self-perceived leadership, peer-nominated leadership, and online engagement.

- **Self-Perceived Leadership**. Students' perceived leadership was measured on a seven-point Likert scale, which was adapted from Yamaguchi and Maehr's (2004) leadership scale. It consists of task-oriented (4 items) and relationship-oriented (5 items) leadership scales, measuring management of activities and interpersonal processes, respectively. Sample items, means, medians, standard deviations, and Cronbach's alpha reliabilities of the scale are presented in Table 1.

- **Peer-Nominated Leadership.** During the five-week research period (week 6-10), students were asked to nominate the emergent leaders for each week; therefore, the *number of peer nominations* was employed as a measure of students' emergent leadership. Peer nomination data were collected in each week with total 5 times during the course of the study.

- **Online Engagement**. Total numbers of students' authored discussion posts in the five weeks were used as the measure for students' engagement in the online course. The engagement data were aggregated into five data points to represent students' online learning engagement for each of the five weeks.

Table 1: Mean, standard deviations, and reliability statistics of perceived leadership scale

Variable	Sample Item	Mean	SD	α
Task Leadership	I gave the directions about how to do the online discussions.	4.01	1.49	.87
Relational Leadership	I tried to get everyone to work together.	3.98	1.41	.88

Findings and discussions

Quantitative findings

To answer the first and second research questions, repeated measures ANOVA was conducted to examine the interaction between students' perceived leadership and engagement and to link the interactions with the five time points in a person-centered analysis, the perceived leadership scale and engagement were dichotomized using a median-splits method (Midgley & Urdan, 2001; Pintrich, 2000). This procedure allowed for the use of repeated measures ANOVAs with multiple independent variables. Taking the task-oriented leadership variable as an example, student scoring below 4.0 were classified as low task leadership (LTL) and those scoring 4.0 and above were categorized as high task leadership (HTL). This resulted in 48% (n=81) classified in LTL group and 52% (n=89) in HTL group. The same method was applied to the perceived relationship-oriented leadership scale and engagement data. Table 2 represents the grouping results through the median splits method.

Table 2. Grouping through median splits method

| Factor	Median	Group	N	%	Average Peer Nomination				
					Week 6	Week 7	Week 8	Week 9	Week 10
Online Engagement	16	Low	81	48%	.35	.33	.35	.21	.41
		High	89	52%	1.07	1.07	1.17	1.20	.96
Task Leadership	4.0	Low	81	48%	.54	.44	.48	26	.43
		High	89	52%	.89	.97	1.04	1.16	.93
Relational Leadership	4.0	Low	79	47%	.67	.67	.61	.42	.57
		High	91	53%	.77	.76	.92	1.00	.80

Then, repeated measures ANOVAs were performed using perceived task-oriented leadership, relationship-oriented leadership, and engagement variables as the between-subject factors, the five time points as the repeated measures factor, and peer-nominated leadership on the five week points as the within-subject factors. The analysis generated two general tests of significance that are relevant to the research questions.

Do time, engagement, and self-perceived leadership have an effect on peer-nominated leadership?

The within-subject analysis showed that there was an overall significant interaction effect of time, perceived leadership, and online engagement on students' emergent leadership nomination [F(4,648)=2.35, p=.05, η^2 =.01]. However, no significant main effects were found in the individual within-subject factors – time, perceived leadership, and online engagement. These results suggest that time, engagement, and self-perceived leadership alone did not significantly influence peer-nominated leadership. However, together, they had significant impact on the emergent leadership perceived by other members in a learning group.

How do engagement and self-perceived leadership influence peer-nominated leadership over time?

The between-subject analysis showed that after controlling the time effect, both perceived task-oriented leadership [$F(1,162)$ =53.29, $p<.001$, η^2 =.06] and engagement [$F(1,162)$=18.84, p=.002, η^2 =.15] had significantly positive effect on students' emergent leadership nomination. Specifically, as shown in Figure 1.A, students who were in high-engagement group were more likely to be nominated as the group leader throughout the five weeks than those students in low-engagement group. As shown in Figure 1.B, students in high-task-leadership group were more likely to be nominated as the group leader throughout the five weeks than those in low-task-leadership group. However, as shown in Figure 1.C, there were no significant differences in the peer nomination between the high-relational-leadership and low-relational-leadership groups. In addition, no significant interaction effects were found in the between-subject factors – perceived leadership and engagement.

A. —— High Engagement Group / —— Low Engagement Group
B. —— High Task-Leadership Group / —— Low Task-Leadership Group
C. —— High Relational-Leadership Group / —— Low Relational-Leadership Group
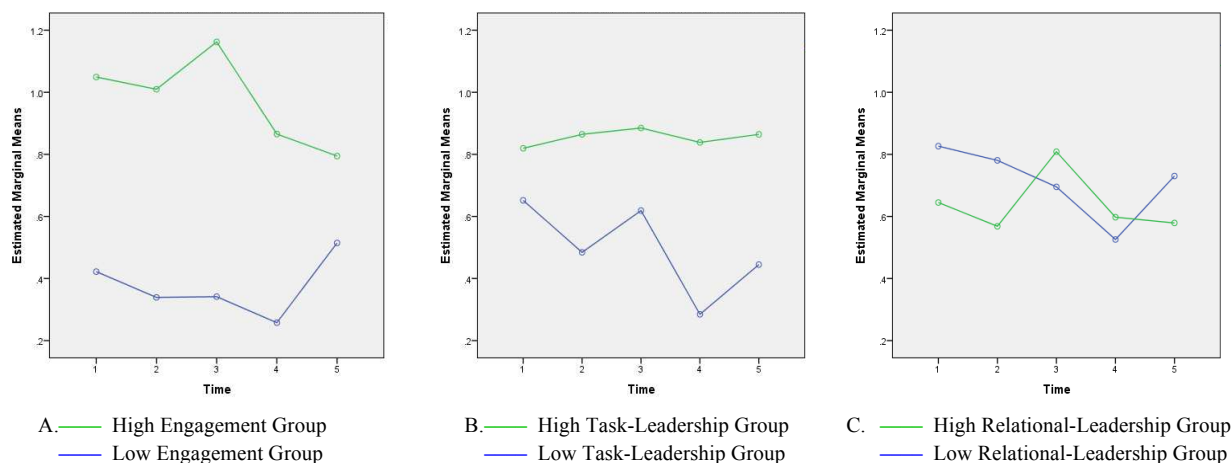
<u>Figure 1</u>. Differences of peer-nominated leadership between groups

In summary, the quantitative results indicated that emergent leadership perceived or nominated by peers in a group not only requires individuals' active engagement and self-perception of their leadership role, but also requires the leadership to be developed over time. High levels of perceived task leadership and active engagement would lead to more likelihood for individuals to be perceived by peers as emergent leaders in a group.

Qualitative findings

What qualitative characteristics do students report to describe the peer-nominated leaders?

In this asynchronous online course, main class activities were facilitated through the weekly online discussions. Therefore, the posting records in the discussion board would reflect the most frequent and visible learning activities where students interacted with each other. The reasons of the leader nomination, therefore, focus around various posting behaviors. By the end of each week, in the nomination surveys, students were asked to nominate one or more leaders in the group and provide justifications for their nominations. Six primary reasons emerged in the qualitative analysis through open coding combined with interpretive coding (Merriam, 1998). The results are delineated in Table 3.

First, 199 instances were identified from the data indicating that the *quality of posts* was the primary reason determining students' nomination. Students indicated appreciation to those posts that had highly relevant, original, thoughtful, and well-structured contributions to group knowledge building. While students spoke highly of the nominees' high-quality posts, they also demonstrated their disappointment on those posts with repeated opinions or being poorly structured.

Second, students generally perceived leadership by receiving the leaders' *active facilitation*. 167 instances were coded relevant to this theme. Timely coordination and replies with constructive suggestions benefited students when they had questions or confusions in group learning. Students tended to recognize individuals as leaders who are willing to voluntarily keep the group functioning and capable to understand, analyze, and solve other students' problems.

Third, 106 instances revealed another critical reason for their nomination, that is, the *quantity and diversity of posts* made by the leaders during online group discussions. Emergent leaders not only gave a large number of posts in the discussion board, but also responded to a wide range of group members. Students recognized that emergent leaders did read posts authored by various group members, and gave at least a reply to almost everyone in the group. In addition, emergent leaders actively and consistently participated in group throughout the entire one-week learning period.

Fourth, 97 instances indicated that *initiation of interaction* in a group discussion is an explicit leadership behavior through posting in the online discussion board. Initiation means that the post is published to the group prior to any other posts under a certain discussion topic. Students also indicated that they regularly reviewed others' posts before writing their own posts. The initial post that started the discussion of the week often led the direction of the discussion for this week. Students who made the initial posts, therefore, naturally had been perceived as the leader and the moderator of the week.

Fifth, 87 instances denoted that students perceived those who practically made a *significant contribution* to the group tasks as their leaders. The leaders completed the major group tasks (i.e., making the

presentation slides, turning in the final paper) or made important decisions (i.e., deciding the topic of group project).

Finally, 22 instances revealed that students were motivated to participate in class activities by those emergent leaders. The leaders *promoted others' motivation*. For example, students reported that they had to read and post more because of the emergent leaders' active engagement, and frequent and timely responding. Some responses from the emergent leaders gave advice to students in an encouraging tone, and made the author feel emotional and motivated on their own learning.

Table 3. Reasons for nomination with sample quotes

Nomination Reason	N	Sample Quote
1. Quality of Post	199	[His opinion is] significantly different from the rest of the group. She provides well-formatted arguments and presents good ideas. [The student made] concise quote that made a number of compelling points.
2. Active Facilitation	163	[The student] replied to many of the posts using constructive tips. She did a lot in terms of keeping everyone on track and making sure we got things done.
3. Quantity and Diversity of Posts	106	She is always constantly posting throughout the week [The student] provided feedback on everyone's comments. [The student] tried to give her input to every person's post. [The student] contributed the most and offered the most input among all the group members.
4. Initiation of Interaction	97	He started off this week's conversation. She was the only person in our group who had posted an initial discussion!
5. Significant Contribution	87	[The student] created the presentation and completed a lot of the skeleton chart. He was the one to suggest module 2 as our topic and put the PowerPoint together.
6. Motivating Promotion	22	She gave me some tips along with being encouraging. This differs from some people who just comment on a post for credit. I believe his comments are substantive.

In addition, the absence of the six factors often led to non-nomination behavior which happened when student chose to not nominate anyone in the group as the emergent leader. Some students who chose not to nominate anyone provided explicit reasons, such as, a late start-up post, lack of responses, little knowledgeable input, or a failure of receiving help from the group. The non-nomination denoted that students perceived a lack of leadership in their group.

Conclusions and implications

The present study made an initial attempt to reveal the nature of leadership emergence in small group online collaborative learning. Beyond a common sense, the study provided the quantitative evidence to argue that the factors – time, engagement, and self-perceived leadership – have a significantly interactive effect on the peer-perceived leadership. This means the emergent leadership perceived by peers in a group requires individuals' active engagement and self-perception of their leadership role, and also requires time to develop. Specifically, consistent active-engagement and self-perceived role of task leadership are the two essential indicators for the emergence of leadership. The students who perceive themselves as the leader in the learning group and actively engage in group discussions are more likely to be nominated as the leader by peers, vice versa. This could provide guidance for designing and managing online group activity where emergent leadership is needed (such as doing a synthesized group project).

Furthermore, both quantitative and qualitative findings suggest the importance of meeting students' need of being supported by leadership. For example, the six main reasons of nomination outline the qualities of an ideal leader that students expected their leaders to have in their group. The matching degree between what the students expected for leadership and what the learning environment provided could be a diagnostic perspective for teaching practitioners to examine different collaborative online learning context.

Last but not least, the findings would help online students to better understand that the conflicts between self-perceived and peer-perceived leadership roles may exist in online collaborative learning activities. Further instructional design could be guided by the present study for helping students coordinate self-perceived and peer-perceived leadership role.

References

Avolio, B. J. (1999). *Full leadership development: Building the vital forces in organizations*: Sage.

Avolio, B. J., & Gardner, W. L. (2005). Authentic leadership development: Getting to the root of positive forms of leadership. *The leadership quarterly, 16*(3), 315-338.

Bass , B. M. (1998). *Transformational leadership: Individual, military and educational impact*. Mahwah, NJ: Erlbaum.

Carte, T., Chidambaram, L., & Becker, A. (2006). Emergent leadership in self-managed virtual teams. *Group Decision and Negotiation, 15*(4), 323-343. doi: 10.1007/s10726-006-9045-7

Edwards, C. A. (1994). Leadership in groups of school-age girls. *Developmental Psychology, 30*(6), 920.

French, D. C., &Stright, A. L. (1991). Emergent leadership in children's small groups. *Small Group Research, 22*(2), 187-199.

Gibson, C., &Vermeulen, F. (2003). A healthy divide: Subgroups as a stimulus for team learning behavior. *Administrative Science Quarterly, 48*(2), 202-239.

Gressick, J., & Derry, S. (2010). Distributed leadership in online groups. *International Journal of Computer-Supported Collaborative Learning, 5*(2), 211-236. doi: 10.1007/s11412-010-9086-4

Hall, D. T. (2004). Self-awareness, identity, and leader development. *Leader development for transforming organizations: Growing leaders for tomorrow*, 153-176.

Huang, R., Kahai, S., &Jestice, R. (2010). The contingent effects of leadership on team collaboration in virtual teams. *Computers in Human Behavior, 26*(5), 1098-1110. doi: DOI: 10.1016/j.chb.2010.03.014

Kahai, S. S., Sosik, J. J., &Avolio, B. J. (1997). Effects of leadership style and problem structure on work group process and outcomes in an electronic meeting system environment. *Personnel Psychology, 50*(1), 121-146. doi: 10.1111/j.1744-6570.1997.tb00903

Merriam, S. B. (1998). Qualitative Research and Case Study Applications in Education. Revised and Expanded from" Case Study Research in Education.".Jossey-Bass Publishers, 350 Sansome St, San Francisco, CA 94104.

Midgley, C., &Urdan, T. (2001). Academic self-handicapping and achievement goals: A further examination. *Contemporary educational psychology, 26*(1), 61-75.

Neubert, M. J., &Taggar, S. (2004). Pathways to informal leadership: The moderating role of gender on the relationship of individual differences and team member network centrality to informal leadership emergence. *The Leadership Quarterly, 15*(2), 175-194.

Pintrich, P. R. (2000). The role of goal orientation in self-regulated learning.

Wakefield, R. L., Leidner, D. E., & Garrison, G. (2008). Research Note-A Model of Conflict, Leadership, and Performance in Virtual Teams. *Information Systems Research, 19*(4), 434-455.

Xie, K., Miller, N.C., & Allison, J.R. (2013). Toward a social conflict evolution model: Examining the adverse power of conflictual social interaction in online learning. *Computers and Education, 63*, 404-415.

Xie, K., Yu, C., & Bradshaw, A.C. (2014). Impacts of role assignment and participation in asynchronous discussions in college-level online classes. *The Internet and Higher Education, 20,* 10-19.

Yamaguchi, R. (2001). Children's Learning Groups A Study of Emergent Leadership, Dominance, and Group Effectiveness. *Small Group Research, 32*(6), 671-697.

Yamaguchi, R. &Maehr, M.L. (2004). Children's emergent leadership: The relationships with group characteristics and outcomes. *Small Group Research, 35*(4), 388-406.

Yukl, G. (1989). Managerial Leadership: A Review of Theory and Research. *Journal of Management, 15*(2), 251.