Examining Leadership Style Influence on Engagement in a National Change Process: Implications for Leadership Education

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Abstract

Individuals expected to offer leadership are often chosen based on their power position within the field of interest and specialization in the context area being addressed and not on their leadership style. Leadership education curriculum often focuses on change as a product of leadership and leadership styles but places little emphasis on how the leadership styles of those chosen to lead change can influence the change process. In order to inform the development of curriculum targeting this aspect of leadership, research needs to be done to determine if leadership style impacts level of engagement in change. This research examined how transformational and transactional leadership styles impacted engagement in a national change process when 39 department chairs of universities across the United States were selected by the National Science Foundation to lead science, technology, engineering and math (STEM) educational reform at the undergraduate level. The findings revealed transformational leadership style positively predicted engagement in change and transactional leadership style negatively predicted engagement in change. While the small sample size makes the findings exploratory in nature and should be used with caution, they imply leadership education curriculum should include lessons on the impact these two styles have on engagement in change since there were statistically significant differences.

Introduction

When individuals are chosen to take on leadership roles the tenants of leadership are often overlooked (Northouse, 2013). Leaders of large-scale change initiatives are typically chosen because they hold a position of power within the area, have built a reputation based on

their expertise, and/or because they have a specialization in the context area being addressed (Buller, 2012; Cipriano & Riccardi, 2010). However, little attention is ever paid to leadership style and how leadership style can influence the level to which an individual engages in a change process and their ultimate success in implementing change.

Curriculum designed to build leadership capacity often includes lessons on change as a product of leadership (Banerjee, 2015; Meyer & Slechta, 2002; Northouse, 2013). Courses discuss ways to plan change, to inspire others and build commitment to a change that will last over time (Burbank, Odom, & Sandlin, 2015; Buschlen & Johnson, 2014). Leadership education curriculum also emphasizes leadership style (Lamm, Carter, Stedman & Lamm, 2014). Discussions occur around what a leadership style is, how people express their leadership styles and the results related to different styles and approaches to leadership (Boyd, 2009; Rosch, 2015). However, little emphasis is placed on how leadership styles of those chosen to lead change can influence the change process. In order to inform the development of curriculum targeting this aspect of leadership, research needs to be done to determine if leadership style impacts engagement in change. This research explores this concept, examining how the leadership styles of a group of leaders, chosen for their subject matter expertise and reputation, engaged in a change process and how their leadership styles influenced their level of engagement in change.

Theoretical Framework

The theoretical framework for this study was based on transactional and transformational leadership (MacKenzie, Podsakoff, & Rich, 2001; Podsakoff, Todor, Grover, & Huber, 1984). Leadership management style plays an important role in how a change is received by others. Transactional and transformational styles of leadership have very different characteristics and one is not considered better than the other; however, leadership style makes a difference in the influence exerted and the change that occurs as a result.

Transactional leadership influences followers though compliance and is contingent on behavior (Podsakoff et al., 1984). Transactional leaders often use rewards to motivate followers to perform highly and punish them when they fail to perform (Crawford & Strohkirch, 2004). Contingent reward behavior is a key component of transactional leadership. With a transactional style of leadership, the leader exchanges rewards upon completion of a task or agreement. Transactional leadership is effective because it is in the best interest of the follower to do what the leader wants (Northouse, 2013). Transactional leaders are more likely to engage in responsive activities. They will want to work within the organizational culture and not stray too far from it (Podsakoff et al., 1984).

Transformational leadership is different from transactional leadership in that it involves changing the values, goals, and aspirations of followers (Abu-Tineh, Khasawneh, & Al-Omari, 2009; Bateh & Heyliger, 2014; Kouzes & Posner, 2009; Li & Hung, 2009). Followers' performance is expected to be consistent with their values, as opposed to expecting a reward for their efforts (MacKenzie et al., 2001). Transformational leaders help their followers do this by providing a clear vision for all to follow, being a role model in their behavior, creating group goals, providing individual support and intellectual stimulation to followers, and expecting

followers to perform at high levels (MacKenzie et al., 2001). Transformational leaders are more likely to engage in proactive activities (Joo & Lim, 2013). They will work hard to change the organizational culture and implement new ideas (Wang & Howell, 2012). Transformational leadership recognizes the need for change, creates a new vision, and then institutionalizes the change (Eisenbach, Watson, & Pillai, 1999).

Transformational leadership is all about the processes of transformation and change (Bass & Riggio, 2006). A transformational leadership style can impact others' commitment to change and their level of effectiveness. Herold, Fedor, and Cladwell (2008) found that under conditions of high personal job impact transformational leadership was positively associated with change commitment. Lastly, House (1976) brought to transformational leadership the idea of charisma. Through charisma, transformative leaders transform followers' self-concepts and link the identity of the followers to the collective identity of the organization (Northouse, 2013).

Purpose and Research Objectives

The purpose of this study was to understand how transactional and transformational leadership styles influenced an identified group of leaders' engagement in a large-scale national change initiative to reform STEM education. The findings can provide insight into how leadership style influences engagement in change and can be used as a resource when developing leadership education curriculum. The research was guided by the following research objectives:

1. Determine the level of transformational and transactional leadership style expression within a group of identified leaders.
2. Identify the extent to which a group of identified leaders engaged in a national change initiative they were chosen to lead.
3. Determine if level of transformational and transactional leadership style expression predicted extent of engagement in a change process.

Background and Context

The need for STEM education has been clearly articulated in the literature. Students need to develop scientific and technical skills to be competitive in the twenty-first century workplace that integrates more technology than ever before (Foster et al., 2010). More specifically, undergraduate students need an education that helps them understand the scientific research process and a general knowledge of science so they can process the world around them and explain it to others. This is imperative so that young adults are competitive in a scientific global workforce and prepared to take on leadership roles in a variety of science, technology, engineering and math (STEM) focused industries (National Research Council, 2003). Unfortunately, many intelligent students bypass STEM majors because they find introductory courses to be dull and boring (Graham, Frederick, Byars-Winston, Hunter, & Handelsman, 2013). The exit rate is especially high for women, racial, and ethnic minorities who are underrepresented in STEM majors but collectively make up 68% of college students in the United States (National Science Board, 2010). For example, African-American students who intend to major in STEM switch to a non-STEM field before graduation twice as often as white students (National Science Foundation, 2011).

It has long been argued the approach to undergraduate STEM education should be modernized to reflect what college students and faculty members have come to know about how students learn (Hakim, 2000; Kenny, 1998; National Research Council, 1997). Student-centered classrooms and scientific teaching practices have been found to enhance student learning and reduce the achievement gap of students from disadvantaged backgrounds (Freeman, Haak, & Wenderoth, 2011; Haak, HilleRisLambers, Pitre, & Freeman, 2011). Despite widespread acceptance that student-centered teaching strategies and approaches are effective, they have not been widely adopted. According to Brownell and Tanner (2012), a significant challenge in altering approaches to STEM education is convincing the majority of life sciences faculty in every institution to change the way they teach (Brownell & Tanner, 2012). Many faculty members have years of experience and suggesting new approaches challenges their current practices (Brownell & Tanner, 2012). In addition, faculty members have reported feeling ill equipped to change the way they teach. Faculty are reluctant to try active learning because they are accustomed to specific teaching practices and lack experience developing different, potentially more effective, approaches to teaching (Brownell & Tanner, 2012; Graham et al., 2013).

In 2007, the American Association for the Advancement of Science (AAAS), supported by the National Science Foundation (NSF), the Howard Hughes Medical Institute (HHMI), and the National Institutes of Health (NIH) initiated a nation-wide conversation on how to better prepare undergraduates for the scientific needs of the twenty-first century with a focus on biology education, one of the core STEM areas found needing educational reform. These conversations were integrated into a report that could be widely distributed: Vision and Change in Undergraduate Biology Education: A Call to Action (Brewer & Smith, 2011). The report detailed needed changes to how STEM education is approached; the support faculty need from their academic departments to alter teaching practices; and addressed the curriculum decision-making process. The conversations generated from instituting the changes suggested in the Vision and Change report (Brewer & Smith, 2011) bloomed into the Partnership for Undergraduate and Life Science Education (PULSE).

It was quickly recognized the nationwide change PULSE was meant to implement was going to require champions appropriately placed within departments across a variety of institutions. College deans and department chairs were identified as having the position, ability, and power to lead change within their institutions because the academic department was determined to be where most university changes occurred (Wolverton, Ackerman, & Holt, 2005). The PULSE leadership team chose to support 39 Vision and Change Leadership Fellows (also known as PULSE Fellows) to develop and implement strategies based on the Vision and Change report (Brewer & Smith, 2011). The PULSE Fellows were chosen from department chairs, assistant/associate deans, and deans at colleges and universities across the nation with the belief that a targeted group of people could bring about systematic change across all types of post-secondary educational institutions nationwide.

However, several studies conducted in higher education have found department chairs receive little to no formal training before assuming their leadership roles. For example, Cipriano and Riccardi (2010) found 81 percent of department chairs reported having no formal training in their administrative responsibilities. Buller (2012) found leaders within academia were promoted

based on their prior work experience in the field and not on their credentials to lead and manage people. According to Buller (2012), most department chairs established a reputation as great teachers and researchers in the field. However, due to a steep learning curve, many department chairs fail at the important aspect of leading change within the first year because of their lack of preparation (Cipriano & Riccardi, 2010). This means the skills most professors have acquired to become strong teachers and researchers are not the same skills one needs to use to run a department. In most cases the individuals who are promoted within higher education are the ones who have received strong evaluations on their individual work ethic (Buller, 2012) with the idea that excellent educators make excellent administrators (Moore & Rudd, 2004; Pittman & Bruny, 1986). In doing so researchers and faculty members are introduced into administrative positions with only limited knowledge of administrative procedures (Pittman & Bruny, 1986).

Despite lack of training, it is expected the assigned position of power would allow the PULSE Fellows to be successful in creating change. What was not taken into consideration was that each PULSE Fellow exhibits a leadership style, and that leadership style not only plays a role in how a leader manages change, and how they address those that follow them, but also their personal engagement in change. Change is difficult and takes time (Kotter, 1993). While each PULSE Fellow was chosen because of their belief in the need to create changes to STEM education, the level of engagement may waiver if they do not feel they are making a difference or able to lead the change they were charged with initiating (Hayes, 2010).

Methods

Online survey research was used to address the research objectives. The research presented here was part of a larger study designed to assess the overall impact of the PULSE Fellows program. As stated earlier, the 39 PULSE Fellows charged with leading nationwide STEM education reform were chosen from department chairs, assistant/associate deans, and deans at colleges and universities across the nation. At the time of data collection they had been working together to create change for 18 months.

Three areas germane to the research objectives of interest were collected in the online instrument: transformational leadership, transactional leadership, and extent of engagement. First, a 14-item transformational leadership scale developed by MacKenzie et al. (2001) was used. The transformational leadership scale was made up of four constructs that measured level of core transformational leadership, performance expectation, individual support, and intellectual stimulation. The instrument was previously found to be reliable in the literature (MacKenzie et al., 2001). Respondents were asked to indicate their level of agreement or disagreement with the 14 statements on a five-point Likert-type agreement scale ranging from 1 – *Strongly Disagree* to 5 – *Strongly Agree*. Responses were averaged to create an overall transformational leadership score. Reliability was calculated *ex post facto* and found to be reliable ($\alpha = .72$).

Next, a five-item transactional leadership scale developed by Podsakoff et al. (1984) was used. The transactional leadership scale had also been widely used in the literature and found to be reliable over time (Podsakoff et al., 1984). Respondents were asked to indicate their level of agreement or disagreement with five statements on a five-point Likert-type agreement scale ranging from 1 – *Strongly Disagree* to 5 – *Strongly Agree*. Responses were averaged to create an

overall transformational leadership score. Reliability was calculated *ex post facto* and found to be reliable ($\alpha = .89$).

Finally, researcher-developed items were included to determine extent of engagement in the internal change process. Respondents were asked to indicate the number of times they had engaged in Vision and Change regional workshops, Vision and Change focused conferences, PULSE conference calls, and proposals to fund research and teaching related to Vision and Change. The reported activities were summed to create an overall engagement score.

Once the survey instrument was drafted, a panel of experts with expertise in survey design and educational programming reviewed it for face and content validity as well as reliability and clarity. Since the population of interest was small, a census was utilized. Due to the use of a census, the findings should only be used to describe the target group of interest (Ary, Jacobs, Razavieh, & Sorenson, 2006). The survey was sent to all 39 Fellows through an e-mail link using Qualtrics, an online survey software, following the Tailored Design Method (Dillman, Smyth & Christian, 2009). After three reminders were sent over three weeks, a total of 34 PULSE Fellows responded resulting in an 87% response rate.

Data were analyzed using SPSS. Descriptive statistics were used to determine the levels of transformational and transactional leadership style expression exerted by the respondents and extent of engagement in the change process. Multiple linear regression was used to determine the level to which transformational and transactional leadership style expression predicted extent of engagement in the change process. It is important to note that the use of inferential statistics on a sample of only 34 should be conducted with caution, however, it was deemed acceptable given the experimental nature of the research (Howell, 2012).

Results

Level of Leadership Styles Expressed. Respondents overall transformational leadership scores could range from a one to a five using the average of the responses to the 14-item transformational leadership scale developed by MacKenzie et al. (2001). Responses can be viewed in Table 1. Respondents' scored an average of 4.10 (*SD* = .66) indicating a relatively high level of transformational leadership. The lowest score amongst the respondents was a 2.40 and the highest score was a 5.00.

Table 1.
Leadership styles exhibited

	M	*SD*
Transformational Leadership	4.10	.66
Transactional Leadership	3.87	.34

Respondents' overall transactional leadership scores could range from a one to a five using the average of the responses to the five-item transactional leadership scale developed by Podsakoff et al. (1984). Respondents scored an average of 3.87 (*SD* = .34), indicating a relatively

high level of transactional leadership but not as high as transformational leadership (Table 1). The lowest score amongst the respondents was a 2.93 and the highest score was a 4.64.

Extent of Engagement in a Change Process. Level of engagement in the change process was also examined descriptively. The most popular way to engage in the change process was through participation on conference calls (Table 2). On average, the respondents had engaged in at least 18 conference calls over the past year indicating each respondent was on a call more than once a month. They had also engaged in at least two conferences and two funding proposals.

Table 2.
Extent of engagement

	M	*SD*
PULSE Fellow conference calls	18.21	14.80
Vision and change focused conferences (outside of regional workshops)	2.65	2.32
Proposals for funding Vision and Change initiatives	2.65	1.35
Vision and change regional workshops	1.24	1.13
TOTAL	*24.74*	*15.09*

Level of Leadership Style Expression Predicting Extent of Engagement. Multiple linear regression was used to determine if level of leadership style expression predicted extent of engagement in a change process (Table 3). When controlling for transactional leadership, transformational leadership was a significant predictor of extent of engagement in a change process, indicating that the more transformational an individual was in their leadership style, the more engaged they were in the change process. In addition, when controlling for transformational leadership, transactional leadership was also a significant predictor of extent of engagement in the change process. This result indicated the less an individual expressed a transactional leadership style, the greater their extent of engagement in the change process. The entire model was significant and accounted for 28 percent of the variation in extent of engagement in the change process.

Table 3.
Regression of leadership style on extent of engagement

	b	*t*	*p*
Transformational leadership	24.38	3.27	.00**
Transactional leadership	-7.68	-2.01	.05*

Note. $R^2 = .28$; *$p < .05$; **$p < .01$.

Discussion and Recommendations

The literature clearly articulates the benefits of both transformational and transactional leadership styles (Northouse, 2013), however this research revealed those with a transformational style were more likely to engage, and stay engaged, in a large-scale change initiative. Above and beyond the context of informing leadership education curriculum, the results revealed leadership educators can play a role in assisting in change initiative leadership selection to ensure leadership styles are identified and used as part of the selection process. Based on these findings it is expected a team of leaders purposively chosen for having a transformational leadership style would be more successful than a team selected for subject matter expertise alone.

The practical value of the results included an empirical investigation of higher education administration levels of transformational and transactional leadership characteristics. Overall, the data indicated the PULSE Fellows tended to be more transformational in their leadership approach as opposed to transactional. Although the sample associated with this research is limited, the results indicated that perhaps higher education administrators are becoming more engaged with forms of leadership that have been associated with higher levels of organizational satisfaction and productivity (Bass & Riggio, 2006), as opposed to continuing to apply strategies that were successful in non-administrative roles (Katz, 1955; Pittman & Bruny, 1986). Future research should replicate the analysis conducted with this study within a broader audience of higher education administrators to see if this is a true trend or specific to the group of individuals chosen to be PULSE Fellows. Perhaps the recruitment techniques used in the selection process either intentionally, or unintentionally, rewarded those that were more transformational in nature.

Furthermore, from a practical vantage point the findings suggested an approach to quantify outcomes associated with leadership style influences. For example, previous research has suggested that a meaningful outcome variable for use in evaluating leadership development programs is to measure the frequency of engagement in leadership positions (Lamm, Carter, & Lamm, In Press). The results of this research indicated that leader behavior in the form of activity participation might also be a valuable measure of performance. Future research would be suggested to extend upon the leader behaviors captured in this study and also include behaviors associated with leaders' followers. For example, collecting quantifiable actions undertaken by faculty members within a leader's department or college may also provide valuable insights as to the utility of transformational versus transactional leadership characteristics on organizational outcomes (Bass, 2008) and not just engagement in change activities but actually influencing change.

From a theoretical perspective there are several noteworthy contributions associated with this research. First, the capacity of level of transformational leadership to predict engagement in change outcomes was unexpected. Previous research has shown that transformational leaders tend to have more productive and satisfied followers (MacKenzie et al., 2001); however, fewer empirical studies have been conducted focused on the behavior of the leaders themselves. The implications of these findings within this sample is that leaders who are more transformational tend to be more active. Perhaps a leader's enthusiasm for a topic or issue, and the need to present an idealized, charismatic image of engagement and the subsequent ability to stimulate follower's

intellect by articulating visions of the future are associated with higher levels of engagement (Podsakoff et al., 1984). When developing leadership education curriculum this finding should be emphasized. Students should learn the behavioral aspects of leadership style expression and recognize deeper levels of engagement by those who are more transformational in nature. It can also be used as a tool to encourage engagement in transformational leadership style behaviors.

A second theoretical contribution was the negative relationship observed between transactional leadership and engagement. Although transactional leaders are expected to be more rooted in the rewards and punishments meted out through positions of authority, the negative relationship with behavior was surprising (Podsakoff et al., 1984). Specifically, a one-unit increase in transactional leadership was associated with a 7.68 unit decrease in engagement activities. Generally, transactional leaders might be expected to be ambivalent regarding activities (Northouse, 2013); however, these results indicated that within this sample the relationship was directional. This finding can be used to inform leadership education curriculum focused on the role transactional leadership can play in creating change. Students should be made aware of the both the benefits and challenges associated with this style when exhibiting it themselves and working with others. By recognizing that transactional leadership can lend itself to disengagement, students can learn techniques to mitigate loss of interest including motivational techniques (Northouse, 2013) and ensuring rewards are clearly articulated for those that need them (Podsakoff et al., 1984).

Although the findings associated with this study are interesting from a practical and theoretical perspective and have implications for both practice and future research, a few limitations must also be acknowledged. First, a small and limited sample limits generalizability. Conclusions and recommendations should only be drawn within the context of the study. A post hoc power analysis was conducted to determine sample sufficiency given the results (Onwuegbuzie & Leech, 2004). The analysis was conducted using the G*Power software package (Faul, Erdfelder, Lang, & Buchner, 2007). Results indicated that with an effect size of .28, alpha of .05, sample of 34, and two predictors the expected power of the model is .75. Although the minimum threshold for expected power is generally considered .80, "like alpha, and despite conventions, power levels should be chosen based on the needs of a particular study" (Keith, 2006, p. 202). Therefore the sample was considered adequate for this exploratory research; however, a limitation is that type II error, or failing to reject a false null hypothesis, should be recognized. Future research is recommended to determine whether results are replicable. Additionally, any self-reported levels of leadership behaviors must be viewed as potentially biased. Socially desirable responding may limit a respondent's ability to accurately represent their behavior. Future research is also suggested to replicate the study in both self and other reported conditions. Such research would provide some measure of the potential for bias in the preceding results. Despite the limitations of the study, the results indicated an interesting relationship between leadership style and engagement in change. Additional studies could be conducting identifying whether or not PULSE Fellows, or similar cohorts, engaged in their own university change initiatives at the same rate as their cohort activities. It would also be interesting to examine if gender played a role in commitment to change, or if it moderated the effects of leadership style. Finally, determining if there are differences in leadership style and commitment to change based on the number of years as a leader could further contribute to this line of inquiry. Continuing a line of research that further explores this relationship can assist in

informing relevant and timely decisions regarding furthering student learning in the field of leadership education.

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