LEADERSHIP EXPERIENCES OF RICE UNIVERSITY ALUMNI

CURRENT STATE OF LEADERSHIP EXPERIENCE AT RICE UNIVERSITY

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LEADERSHIP EXPERIENCES OF RICE UNIVERSITY ALUMNI

The current executive white paper provides alumni, faculty, researchers, and administrators with the current outlook of alumni’s leadership experiences during their time at Rice University. Currently, there is a lack of research that empirically examines the leadership emergence of undergraduates through objective measurements of leadership. Research has shown that the vast majority of programs identify leadership emergence through subjective attitudinal and behavioral intentions measures. The current applied research provides Rice University leaders with insights on the leadership experiences of alumni from Rice University measured through innovative and objective methodology. At the Doerr institute, we have created a valid and reliable measure called Student Leadership Experience Measure (SLEM) in order to examine the leadership experiences of alumni from Rice University. Results show differences based on Doerr status and gender on leadership experience. We found marginal, but no significant difference based on race/national status. The practical implications of the current research inform researchers and leadership teams at the university that there is a need to encourage alumni to become more involved with leadership opportunities prior as they become prepared to enter the workforce. Most importantly, there is a great need to enhance and develop the SLEM methodology as a critical tool to predict future leadership potential of students at Rice University.

BACKGROUND LITERATURE

Previous research has long debated whether leaders are born versus made (see Avolio, 2005; Kirkpatrick & Locke, 1991). However, the current practical research argues that leadership, like any other skill, needs to be learned and practiced. Such argument has been postulated by previous scholars such as Komives, Lucas, and McMahon (2009). We argue that leadership should be one of the core developmental opportunities for post-secondary students. These developmental opportunities should be empirically understood and practiced by undergraduate students across universities. These arguments have been used for more than two decades as researchers have advocated for the importance of developing young men and women during their post-secondary years to become future leaders. Finally, we argue that leadership development encompasses various activities, deliberate practices, and experiences that go well beyond the traditional forms of studying such topics through capturing subjective ratings of individuals’ attitudinal and behavioral intentions of leadership growth (Bass, 1999; Day, Fleenor, Atwater, Sturm, & McKee, 2014).

Many of the leadership development programs in post-secondary education that have been designed for students aimed to increase their knowledge of leadership abilities (e.g., Nelson, Grint, & Bratton, 2004) and coach critical leadership skillsets (e.g., Guthrie & Meriwether, 2018). These two goals of programs should be at the core of their missions. However, it is critical to encourage deliberate practice to engage alumni in leadership opportunities during their post-secondary education. Yet, there is currently very little research that provides an empirical study in assessing the current state of leadership development in undergraduate students from an objective perspective (Northouse, 2018). Hence, the current research provides further insights into post-secondary students’ leadership development by examining their leadership experiences.
OBJECTIVE

The current goal of this grant was to provide further insights of the leadership development of alumni from Rice University who participated in the Doerr Institute program compared to alumni that were not affiliated with the institute by examining their undergraduate leadership experiences. In order to do this, we developed a Student Leadership Experience Measure (SLEM), which measured the objective participation in leadership roles during alumni’s post-secondary career. We examined their roles in student activity clubs and provided them with a measurable leadership score that aimed to capture their leadership experiences. Other key demographic variables (e.g., Race, Gender, and Graduation Date) were also examined. The current analysis was conducted using the Senior Exit Survey of Spring 2016, 2017, and 2018 graduating classes. In order to validate our measurement, we conducted focus groups with student leaders across campus. These students served as subject matter experts for our measurement validation work. In addition, we validated our scoring systems by analyzing an independent dataset on self-reported leadership development by club leaders provided by the Student Activities Group.

METHODOLOGY

In order to create the SLEM scores, we analyzed the participation of alumni in clubs using the Senior Exit Surveys from 2016, 2017, and 2018. The different types of clubs included blanket tax, academic, social, special interest, media communications, cultural, political, religious, service, performance arts, and club sports organizations. In addition to these, we also included residential college roles as part of the overall SLEM scores. These scores were generated for a total of 217 Doerr alumni. In addition, we randomly selected an overmatched sample of 424 non-Doerr alumni. The non-Doerr alumni were overmatched by a multiple of 2 in terms of academic major, gender, and racial status. For instance, if there were two Female Black bioengineering Doerr Alumni, they were randomly matched to four Female Black bioengineering non-Doerr alumni. The same matching method was used for students in all majors. There were a total of 37 majors represented. Specifically by school, there were 8 alumni from the School of Architecture, 228 alumni from the George R. Brown School of Engineering, 34 alumni from the School of Humanities, 4 alumni from the Shepherd School of Music, 178 alumni from the Wiess School of Natural Sciences, 188 alumni from the School of Social Sciences, and one student from the Interdisciplinary and Other Academic programs. The students from the interdisciplinary program could not be overmatched because these students were extremely unique in terms of major, race, and gender. As a result, we analyzed the data of 641 alumni (57% women and 43% men) who graduated in 2016, 2017, and 2018. Most participants self-identified as White (44%), followed by Asian (36%), Hispanic (7%), Black (5%), Mexican-American (4%), and Multi-racial (3%). Less than one percent did not report their racial status. A total of 10 percent of the alumni used for this grant was considered international.

MEASUREMENT DEVELOPMENT

Various versions of the SLEM scores were created based on (1) a priori predictions, (2) focus groups, and (3) data shared by the Students Activity Group. For a priori predictions, researchers
predicted that roles that have greater leadership responsibilities should obtain greater leadership experience scores. Student leaders of clubs and residential colleges were invited to serve as subject matter experts in focus groups. Results from these groups concluded that residential college presidents and vice-presidents will always get a higher score than their president and vice-president peers of clubs. One common theme that emerged from the focus groups was that leadership roles within the residential colleges require more time and commitment and have greater consequences than do leadership roles in most university clubs and student organizations. Finally, results from data gathered by the Student Activity Group showed that the size of student groups within which alumni serve as leaders were significantly associated with the degree of leadership responsibility that various roles entailed, as evaluated by alumni themselves. Findings suggested that leaders from clubs with student body populations over 100 have more leadership responsibilities. Thus, we decided to give leaders of these groups an additional point in the SLEM score to reflect their greater leadership responsivity compared to leaders from clubs with less than 100 members. Finally, the versions for SLEM included (1) unweighted scores, (2) weighted scores, and (3) executive scores. Refer to Figure 1 for a graphic representation of the general weight system used for roles in Club or Residential Colleges. This paper will discuss these assertions further in the next sections.

Figure 1. SLEM scoring systems for roles in organizations/clubs and residential colleges. Unweighted SLEM scores reflect scores as shown by the pyramid. Weighted SLEM scores reflect an additional point (+1) for presidents, vice-presidents, and chairs in clubs and organizations only. Executive SLEM scores only represent the top two categories of the pyramid that represent presidents, vice-presidents, chairs, and chief justices. Any other roles that are not captured in the pyramids received zero points.

Overview of SLEM Scores

SLEM scores were based on the roles and positions that alumni held during their time at Rice. Scores were given to roles according to three major distinctions: (1) presidents, (2) vice presidents and chief justices, and (3) supporting personnel. For the weighted version of the SLEM, these scores were weighted differently for presidents and vice presidents for clubs larger than 100 members, as described in detail below. Future research representatives of Doerr institute can use the scoring system reflected by Figure 1 to automate a SLEM score. In addition, you may also categorize recode the values directly via Qualtrics.
Unweighted SLEM Scores

The unweighted version of the SLEM contained scores given for leadership positions in the residential colleges, clubs, and student organizations. For the residential colleges, presidents were assigned 5-points, VP’s (e.g., Internal VP, External VP, Other VPs, and Chief Justices) were assigned 3-points, and the supporting personnel (e.g., Treasurer and Secretaries) were assigned 1-point. For clubs and organizations, presidents were assigned 3-points, VP’s were assigned 2-points, and the supporting personnel (e.g., Treasurers and Other Leadership Positions) were assigned 1-point. This scoring system was evaluated and supported by feedback from student subject matter experts. A total of 49% of Rice alumni used for this grant had a unweighted SLEM score of 1 or more points based on the roles they held during their time at Rice. Among alumni with non-zero scores, the vast majority of scores were between 1 and 6 points. Five percent of alumni had scores above 7 points. However, 51% of the alumni did not hold a leadership position during their college career that gave them a score above zero.

Weighted SLEM Scores

The weighted version of the SLEM utilized the same basic system as the unweighted version, with one change. Specifically, an additional point (+1) was given to presidents and vice presidents of clubs that had 100 members or more (e.g., Large Clubs). There were a total of 265 student organizations that consisted of less than 100 members and 32 clubs that consisted of 100 members or more (Refer to Appendix A for the names of these clubs). In order to validate this weight system, researchers collaborated with the Students Activity Group to examine the leaders’ perceptions of their leadership skill development as a result of their leadership position. They were asked to rate their skill development in various leadership areas from 0 (Being Undeveloped) to 10 (Being Fully Developed). Results showed that leaders from clubs that have 100 members or more were reported greater leadership skill development in the areas of effective communication, $F(1, 291) = 8.36, p < 0.01$, partial eta-squared = .028, conflict resolution, $F(1, 291) = 7.63, p < 0.01$, partial eta-squared = .026, and legacy development, $F(1, 291) = 6.58, p = 0.01$, partial eta-squared = .022, than those leading club under 100 members. Specifically, leaders of large clubs ($M = 8.56, SD = 1.43$) reported greater leadership development in communications than those from smaller clubs ($M = 7.91, SD = 1.32$). Also, leaders of large clubs ($M = 8.23, SD = 1.31$) reported greater leadership development in conflict resolution than those from smaller clubs ($M = 7.50, SD = 1.40$). Finally, leaders of large clubs ($M = 7.74, SD = 1.48$) reported greater leadership development in legacy development than those from smaller clubs ($M = 6.81, SD = 1.97$). Hence, these results validate our weight system to add an extra point for leaders that led clubs with 100 members or more. Similar to the unweighted SLEM score distribution, A total of 49% of the alumni had a weighted SLEM score of 1 or more leadership points during their time at Rice. Also, most of the weighted SLEM scores remained between 1 and 6 points. Once again, less than 6% of alumni had scores above 7 points. Fifty-one percent of alumni had a weighted SLEM score of zero. Thus, there were no substantial differences in the distribution of scores using the unweighted and weighted version of the SLEM.
SLEM Executive

The executive SLEM scores used the same scoring methodology as the weighted SLEM scores. However, roles within the supporting personnel category (e.g., third and bottom category of the pyramid in Figure 1) were not given any points toward their executive score. The executive SLEM scores provide a slightly different view of leadership responsibilities at the highest levels within all of the various student organizations on campus. This alternative scoring system has the potential to yield different conclusions about student leadership experiences, insofar as two alumni could obtain the same SLEM scores in very different ways. One could have served in many roles in a variety of groups, but never above the supporting personnel level. The other could have served in fewer roles but at the highest levels possible. Although these two alumni could have the same SLEM scores, the latter student might end up with more valuable leadership experience by serving as a club president than by serving as the treasurer of 5 different small clubs. In the responding sample of alumni, only 29% had a non-zero executive SLEM scores. The majority of alumni with non-zero scores had scores between 2 and 6 points. Most alumni (71%), however, did not earn any executive SLEM points.

EXPLORATORY RESULTS FOR SLEM SCORES

It is important to note that the results we presented do not differ appreciably based on whether we use the weighted, unweighted, or executive version of the SLEM scores. As shown by Figure 2, there is a significant overlap between the three versions of SLEM. Results showed that on average alumni had an unweighted SLEM score of 1.84 (SD = 2.91), weighted SLEM score of 1.90 (SD = 2.99), and executive SLEM score of 1.29 (SD = 2.49). Hence, for the exploratory analyses using Doerr alumni status, gender and race as key variables, we decided to use weighted SLEM and executive SLEM scores to examine any critical outcomes. The majority of alumni with non-zero SLEM scores earned their scores through participation in leadership roles that we classified as supporting personnel or (to a lesser extent) vice-president/chief justice. This fact is unsurprising, given the reality that there are more such positions available to alumni than there are positions at the executive level.
Figure 2. Overlap of SLEM scores for unweighted, weighted, and executive versions.

Exploratory Analyses based on Doerr Alumni Status, Gender and Race

In order to examine differences of alumni who were part of Doerr compared to those who were non-Doerr affiliated in weighted SLEM scores, an independent samples t-test was conducted. Given a violation of Levene’s test for homogeneity of variances, $F(1,639) = 19.85, p < .001$, a test not assuming homogenous variances was calculated. The results of this test indicated that there was a significant difference in Doerr alumni participation during their undergraduate career, $t(331.78) = 4.17, p < .001$, Cohen’s $d = 0.37$. These results suggest that alumni who participated in the Doerr institute ($M= 2.65, SD = 3.59$) had greater weighted SLEM scores than non-Doerr alumni ($M= 1.51, SD = 2.56$). These results showed that Doerr alumni, in general, had
one more leadership experience during their undergraduate career than non-Doerr alumni (see Figure 3).

![Weighted SLEM scores of Doerr alumni compared to non-Doerr alumni.](image)

**Figure 3.** Weighted SLEM scores of Doerr alumni compared to non-Doerr alumni.

Similar results were found when we analyzed the Executive SLEM scores. The findings indicated that there was a significant difference in Doerr alumni executive participation during their undergraduate career, $t(315.11) = 3.74, p < .001$, Cohen’s $d = 0.33$. These results suggest that alumni who participated in the Doerr institute ($M = 1.87, SD = 3.10$) had greater executive SLEM scores than non-Doerr alumni ($M = 1.00, SD = 2.05$). These results showed that Doerr alumni, in general, had more executive positions than those who were non-Doerr alumni (see Figure 4).
To understand the association between race/nationality and gender on leadership experiences of alumni during their undergraduate career, we conducted a two-way ANOVA on weighted SLEM scores. For the purpose of this analysis, we combined Black, Hispanic, Mexican-American, Multiracial, and Unknown as underrepresented alumni. International students were used as a racial/ethnic background because it is one of the options students can select for their racial and ethnic background in the Senior Exit Surveys. Prior to conducting these analyses, we checked for outliers that were 3 inter-quartile range away from the third quartile. We found a total of 13 outliers (These included caw8, yk30, ph14, tmc6, trf2, kdd2, rer7, yk30, af13, bct4, ztb1, jc79, and dtg4). Results showed that there was not a significant interaction, $F(3, 621) = 2.49, p = 0.06$, partial eta-squared = .012. Even though it was not significant, there is still evidence that Asian-American females showed higher weighted SLEM scores compared to their male counterparts and any other group (See Figure 5). Results showed that gender was significantly associated with weighted SLEM scores, $F(1, 621) = 4.07, p = 0.04$, partial eta-squared = .007. Specifically, female alumni ($M= 1.93$, $SD = 2.61$) reported higher weighted SLEM scores than their male counterparts ($M= 1.31$, $SD = 2.08$). Finally, there were no significant differences between the different racial/ethnic groups on weighted SLEM scores (see Table 1). Hence, the main finding of these outcomes showed that gender was associated with the weighted SLEM scores, but in the opposite direction that might have been predicted.

Figure 4. Executive SLEM scores of Doerr alumni compared to non-Doerr alumni.
Figure 5. Weighted SLEM scores between racial/ethnic background and gender of alumni.

Table 1.

Weighted SLEM scores by Racial Background and Gender of Alumni.

<table>
<thead>
<tr>
<th>Racial/Ethnic Background</th>
<th>Gender of Alumni</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>N</th>
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<td>Asian-American</td>
<td>F</td>
<td>2.38</td>
<td>2.98</td>
<td>125</td>
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<td></td>
<td>M</td>
<td>1.04</td>
<td>1.86</td>
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<td>204</td>
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<tr>
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<td>1.43</td>
<td>1.76</td>
<td>69</td>
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<tr>
<td></td>
<td>M</td>
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<td></td>
<td>Total</td>
<td>1.43</td>
<td>1.83</td>
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<tr>
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<td>F</td>
<td>2.02</td>
<td>2.75</td>
<td>126</td>
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<td></td>
<td>M</td>
<td>1.47</td>
<td>2.31</td>
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<td></td>
<td>Total</td>
<td>1.75</td>
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<tr>
<td>International</td>
<td>F</td>
<td>1.10</td>
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<td>41</td>
</tr>
<tr>
<td></td>
<td>M</td>
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<tr>
<td></td>
<td>Total</td>
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<td>1.80</td>
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</table>
Leadership Development of Alumni

12/16/2018
Leadership experiences of Rice University Alumni

<table>
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<tr>
<th></th>
<th>F</th>
<th>2.61</th>
<th>361</th>
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</table>

In addition to the previous analyses conducted on weighted SLEM scores, we also conducted the same analysis using the outcome of executive SLEM scores. The same 13 outliers found in the previous analysis were not used for the current ANOVA test in order to keep consistency. Results showed that there was not a significant interaction, $F(3, 621) = 0.89$, $p = 0.45$, partial eta-squared $= .004$. Despite the lack of an interaction, Figure 6 shows a similar pattern to the findings previously mentioned for the weighted SLEM scores. Results showed that gender was not significantly associated with executive SLEM scores, $F(1, 621) = 2.95$, $p = 0.09$, partial eta-squared $= .005$. Specifically, female alumni ($M= 1.27$, $SD = 2.14$) had a larger executive SLEM score than their male counterparts ($M= 0.88$, $SD = 1.84$). Finally, there was no significant differences between the different racial/ethnic groups on weighted SLEM scores, $F(1, 621) = 1.78$, $p = 0.15$, partial eta-squared $= .009$. Refer to Table 2 for any means associated with this analysis. Despite the lack of differences in gender and race/ethnic background of alumni in their participation in the executive position, these results are promising to show that there may be a lack of systematic differences found in executive positions based on students’ backgrounds.
Figure 6. Executive SLEM scores between racial/ethnic background and gender of alumni.

Table 2.

Executive SLEM scores by Racial Background and Gender of Alumni.

<table>
<thead>
<tr>
<th>Racial/Ethnic Background</th>
<th>Gender of Alumni</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asian-American</td>
<td>F</td>
<td>1.40</td>
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<tr>
<td></td>
<td>Total</td>
<td>1.10</td>
<td>2.02</td>
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</table>

CONCLUSION

This grant provides the Doerr institute with an initial insight of a long-term project related to alumni leadership experiences. This grant was able to accomplish the following: (1) surveyed the university via questionnaires and focus groups to establish a general leadership experience score, (2) created a validated scoring system for all club and residential colleges roles, (3) provided three alternatives for this scoring system (e.g., unweighted, weighted, and executive SLEM scores), and (4) provided descriptive and inferential analyses for demographic and other related variables associated these outcomes. Findings suggested that alumni held on average less than 2 leadership positions while they were at Rice University. Most of their participation in clubs were not associated with leadership positions. The vast majority of positions held by alumni while at Rice University are in the second (i.e., VPs, Chief Justices, and Chairs) and third categories (i.e., Treasurers, Secretary, and other leadership positions). This is not surprising because there are fewer available positions to become the president of a club.
One of the most important findings in this research showed that alumni who participated in the Doerr Institute while at Rice University were more likely to have a greater leadership and executive scores compared to alumni that did not participate in the Doerr Institute. These can be interpreted in two forms: (1) Doerr Institute serves as a catalyst to motivate students to obtain leadership positions while at Rice University or (2) Students with greater leadership experiences at an undergraduate level seek more opportunities at the Doerr Institute. Hence, one future research implication of this grant suggests that researchers should identify the effect the Doerr Institute has on their students by following their leadership participation post coaching or any Doerr related event. We could not capture this specifically because of the participation of students in various leadership roles is asked only during the Senior Exit Survey prior to graduating from Rice University.

Other critical findings suggest that the only demographic difference found in leadership experience scores were based on gender. Such that, female students had greater leadership experience scores than their male counterparts. Even though we did not find evidence of any significant differences between the racial groups, one particular group that is lagging behind in leadership experiences are international students despite gender. This group tends to be lower than any other racial/ethnic group except Asian-American male students. Hence, it is critical to propose different interventions for this unique group in order to help them raise their leadership engagement while at Rice University. We understand that international students should not be considered a race or ethnic group. However, this is one of the answer choices available when students are asked about their race and ethnicity during the Senior Exit Survey.

Finally, the largest implication of this research is to continue to examine the relationship between undergraduate leadership experiences and alumni occupational trajectories. Specifically, a major question about this grant is whether those students with greater SLEM scores will become tomorrow’s leaders in corporations and other institutions throughout the world. Hence, the next step for this grant will be to connect alumni leadership scores to their future career trajectories, which is an extension of this grant that will be led by the Doerr Institute. Specifically, we created an Alumni Survey that will be sent to all 641 alumni identified in the current grant. The survey asked various questions about leadership development, current occupation details (e.g., salary, level, number of followers, etc.), and their unique succession planning (e.g., identified as a High-Potential). From the 641 alumni analyzed in the current study, 32% of them stated that they were planning on attending a graduate school upon graduation, 35% already had signed an offer for a job, 33% percent did not report their plans, and 1% were going to graduate school while working. This post-graduate plans should be taken into consideration as the Doerr Institute plans their long-term goal with the Alumni Survey. We predict that in order to create a model that may predict the future leadership potential of students based on their SLEM scores, the Doerr Institute should continue to invest in the Alumni Survey for years to come.
REFERENCES


# APPENDICES

## Appendix A

### Clubs with Sizes over 100 members

<table>
<thead>
<tr>
<th>Club Name: *</th>
<th>Club Abbreviation:</th>
<th>Approximate Membership Numbers (lower bound): *</th>
<th>Approximate Membership Numbers (upper bound): *</th>
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Appendix B

Syntax for SLEM Weighted

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Q1331_13_1.0*3,Q1331_13_2.0*2,Q1331_13_3.0*1,Q1331_13_4.0*1,
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Leadership Development of Alumni

12/16/2018
Leadership experiences of Rice University Alumni

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Leadership Development of Alumni

Leadership experiences of Rice University Alumni
Leadership Development of Alumni

Leadership experiences of Rice University Alumni

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