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Introduction to leadership development using the "Five Practices" framework in a co-curricular pharmacy student-development program

Abstract

Introduction and leadership framework: With the increased expectation that [pharmacy](#) education should prepare students to become pharmacy leaders, schools of pharmacy are struggling to find ways to incorporate leadership topics. One way to incorporate content is to build co-curricular programs that introduce and practice leadership frameworks. The co-curricular program described in this study introduces leadership content using Kouzes and Posner's Student Leadership Challenge. Educational context and methods: Students were offered three workshops developed around the Five Practices framework. Each workshop provided background knowledge before engaging in self-reflection, discussion, and application activities. Students participated in a pre-/post-series assessment of leadership practices, as well as surveys after each workshop assessing achievement of learning outcomes.

Findings and discussion: Average attendance at the workshops was 68, with participation from all professional years. A total of 43 students participated in the entire series and completed the pre- and post-surveys. In general, a majority of students found that the learning objectives of each session were met, and > 90% found that sessions were beneficial and that they planned to implement what they learned. In the pre- and post-series assessment, students experienced statistically significant improvements in four of the five practices as well as in their perceived overall leadership skills ($P < .001$).

Implications: This program represents an easily implemented option for schools of pharmacy to increase leadership development. Requiring a small amount of student commitment and faculty investment, meaningful gains in leadership skills and knowledge can be gained within the student population.

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1 **Introduction to leadership development using the “Five Practices” framework in a co-curricular**
2 **pharmacy student-development program.**

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19 **Abstract**

20 Introduction and leadership framework: With the increased expectation that pharmacy education
21 should prepare students to become the pharmacy leaders of tomorrow, schools of pharmacy are
22 struggling to find ways to incorporate leadership topics into their programs. One way to incorporate
23 content is to build co-curricular programs that introduce students to leadership frameworks and allow
24 them to practice skills and behaviors of strong leaders. The co-curricular program described in this
25 study introduces leadership content through the use of Kouzes and Posner’s The Student Leadership
26 Challenge: Five Practices for Becoming an Exemplary Leader.

27 Educational context and methods: As part of a yearly Student Development Workshop Series, students
28 were offered a series of three workshops developed around the Five Practices framework. Each
29 workshop provided background knowledge before engaging in self-reflection, discussion and activities
30 to apply the knowledge presented. Students participated in a pre- and post- series assessment of
31 leadership skills and activities, as well as short surveys after each workshop assessing achievement of
32 learning outcomes.

1 Findings and discussion: Average attendance at the workshops was 68 students, with participation from
2 all four professional years. A total of 43 students participated in the entire workshop series and
3 completed the pre- and post-surveys. In general, the vast majority of students found that the learning
4 objectives of each session were met, and greater than 90% found that sessions were beneficial and that
5 they planned to implement what they learned. In the pre- and post-series assessment, students
6 experienced statistically significant improvements in 4 of the 5 practices as well as in their perceived
7 overall leadership skills ($p < 0.0001$).

8 Implications: This program represents an easily-implemented option for schools of pharmacy to increase
9 their leadership development. Requiring a small amount of student commitment (approximately 8
10 hours over an academic year) and faculty investment, meaningful gains in leadership skills and
11 knowledge can be gained within the student population.

12

13 **Keywords:** student leadership; student leadership challenge; leadership development; pharmacy co-
14 curriculum

15 **Conflict of Interest:** The authors have no conflicts of interests or financial disclosures to declare.

16 **Abbreviations:** American Association of College of Pharmacy (AACP); Accreditation Council for Pharmacy
17 Education (ACPE); American Pharmacists Association Academy of Student Pharmacists (APhA-ASP);
18 Center for the Advancement of Pharmacy Education (CAPE); Interquartile Range (IQR)

19 **Specific Contribution to Literature:** Many leadership frameworks exist in the literature and these have
20 been used in various formats in higher education. This work represents the novel application of an
21 existing leadership framework (The 5 Practices Framework) in an optional workshop series within a
22 pharmacy school. As pharmacy programs seek ways to implement the leadership requirements set by

- 1 the ACPE Standards, this program represents an option for schools to try that allows for flexibility, low
- 2 faculty effort and low cost without requiring time within the their already-packed curricula.

1 **Introduction and leadership framework**

2 In 2009, the American Association of Colleges of Pharmacy (AACP) Argus Commission explored
3 the ways in which pharmacy education can “create agents of change for pharmacy and society”.¹ A
4 driving force for this exploration was the identified need for new leaders within the field, thanks in part
5 to the anticipated retirement of many current pharmacy leaders and reduced interest in leadership
6 among current pharmacists.² The resulting report prioritized finding methods, both curricular and co-
7 curricular, to improve leadership development among students. As such, the current Center for the
8 Advancement of Pharmacy Education (CAPE) 2013 educational outcomes include leadership as its own
9 subdomain – 4.2 -- and charge pharmacy schools with empowering students to “demonstrate
10 responsibility for creating and achieving shared goals, regardless of position”.³ The Accreditation
11 Council for Pharmacy Education (ACPE) Standards 2016 place a greater emphasis on achievement of the
12 CAPE outcomes, incorporating the four CAPE outcomes as the first of the Standards, and hold schools
13 accountable for both coverage of and outcomes related to these standards.⁴

14
15 The idea of leadership development is not new in higher education, or in pharmacy. External
16 programs, like the American Pharmacists Association Academy of Student Pharmacists (APhA-ASP)
17 Leadership Training Series has existed since 2007 and was developed specifically to develop student
18 pharmacy leaders.⁵ Training internal to schools of pharmacy was imbedded in pharmacy education, and
19 manifested as leadership courses, institutes, rotations, and other opportunities well before publication
20 of the AACP report and CAPE 2013 outcomes.⁶⁻⁸ However, since the publication of both the CAPE 2013
21 outcomes and the ACPE Standards 2016, colleges and schools of pharmacy have been exploring ways to
22 meaningfully incorporate new and expanded student leadership development opportunities.

23

1 Guidance for schools was necessary to help make the required advancement, and a 2013 report
2 by Janke and colleagues sought to establish competencies for student leadership development in Doctor
3 of Pharmacy programs.⁹ Eleven competencies were recommended, focused first on the foundations of
4 leadership (Leadership Knowledge and Personal Leadership Commitment) followed by Leadership Skill
5 Development.⁹ These competencies provided direction for many schools of pharmacy struggling to
6 implement the CAPE 2013 outcomes. However, myriad challenges continue to hinder efforts of schools
7 to incorporate meaningful programs. The first, time, is a barrier to the implementation of many great
8 ideas in education. With packed curricula, constraints on faculty time, and over-worked students, it can
9 be difficult to find a place for leadership training. Secondly, there is a limit in the interest and expertise
10 of faculty. As identified by White, there is a leadership gap and lower interest among current
11 pharmacists, which limits the availability of individuals qualified or interested in developing or delivering
12 training to students.² A third challenge is that of assessment. In order to satisfy the ACPE requirements,
13 competencies must be met, which necessitates assessment of leadership programs in order to
14 demonstrate their efficacy. Finally, many different leadership models exist, making it difficult to select
15 one to follow and implement. The result of these challenges has been various methods and models
16 employed by schools of pharmacy. In a 2016 report by Feller and colleagues, 41.3% of schools of
17 pharmacy were offering leadership courses (didactic and/or experiential) and 19.6% offered projects or
18 programs (e.g., speaker series, workshops, one-time speakers, certificates, retreats, institutes).¹⁰ The
19 results of this study show that there is no “one size fits all” approach to student leadership
20 development, and that schools can pick approaches that best fit their curriculum, student population,
21 and faculty strengths.

22
23 For this study, the considerations and guidance discussed above were employed to develop a
24 student leadership development program that would be co-curricular (i.e., not a required activity and

1 outside of coursework), longitudinal in design, and would address the three categories of competencies
2 identified by Janke and colleagues.⁹ In order to do this, one model of leadership was chosen as a focus.
3 The Student Leadership Challenge is based on the popular Five Practices for Becoming an Exemplary
4 Leader, from the same authors.¹¹ The Five Practices approach utilizes the Leadership Practices Inventory
5 (LPI) assessment developed and validated in the 1980s as a way to measure the behaviors of leaders.¹²
6 From the development of the LPI emerged five practices that good leaders exhibit: (1) challenging the
7 process, (2) inspiring a shared vision, (3) enabling others to act, (4) modeling the way, and (5)
8 encouraging the heart.¹² In this program, students were first introduced to the concept of what
9 leadership is, why it is important in pharmacy and how it is different than management. Through a
10 series of reflections, self-assessments, and exercises, the Five Practices model was then utilized to help
11 students identify who they are as leaders, and how to grow their skills and increase their behaviors in
12 each of the five categories outlined by the Student Leadership Challenge.

13

14 **Educational context and methods**

15 In 2014, the Student Development Workshop Series was created to provide an optional
16 opportunity for students to participate in development activities outside of the traditional pharmacy
17 curriculum. Each academic year a committee consisting of both students and faculty decided on a
18 theme for the year's workshops. Past series focused on topics such as student academic success,
19 creating a personal brand, and career search preparation. In the 2017-2018 academic year, the
20 committee chose the topic of student leadership after input from both students and faculty identified a
21 need. The resulting program was designed around four main factors: increasing the exposure to
22 leadership during the pharmacy program, strengthening current leaders, empowering reluctant leaders,

1 and providing a framework for students to be everyday leaders, even when not in formal leadership
2 positions.

3 A number of logistical considerations went into planning the series in a manner that maximized
4 student involvement while keeping the workload for participating faculty reasonable. Workshops were
5 offered on weekday evenings and were planned around the students' exam calendar. Light snacks were
6 also provided as an added incentive to attend. Workshops required no preparatory work for students
7 and were planned in a manner that had as many active and interactive components as possible while
8 limiting lecture-style content. Finally, other skills relevant to the experience of pharmacy students were
9 incorporated to show students how leadership can be practiced even in small every-day tasks. This
10 included framing leadership content around topics such as writing professional and persuasive emails
11 advocating for positive change, overcoming communication apprehension that can prevent action, and
12 improving presentation skills to better advocate and educate others. To reduce faculty workload,
13 student representatives assisted in the preparation and delivery of each program. The use of an existing
14 leadership framework was chosen based on the availability of materials and activities that were ready to
15 use.

16 The workshop series consisted of three workshops targeting leadership development and
17 focusing on the competencies and guiding principles of Student Leadership Development in doctoral
18 pharmacy programs.^{9,13} The leadership framework used for the series was based on the Five Practices
19 for Becoming an Exemplary Leader.¹¹ This framework focuses on the behaviors that make leaders
20 successful: model the way, inspire a shared vision, challenge the process, enable others to act, and
21 encourage the heart. This program was not developed to be a comprehensive leadership training
22 course. Instead, the focus was to introduce students to leadership concepts and to demonstrate ways
23 to incorporate strong leadership into common activities.

1 The optional series was open to all students in the graduate pharmacy program. The first
2 workshop was in the fall semester and the second and third workshops were held in the spring
3 semester. The three workshops offered were titled: (1) Understanding Your Leadership Style, (2)
4 Overcoming Your Communication Challenges, and (3) Communicating your Leadership Persona. Each of
5 the three workshops included background information on leadership, covered skills necessary for
6 leaders, and integrated both lecture and activities targeted to one or more of the Five Practices. Over
7 the course of the series, all five practices were covered at least once, and the students were provided a
8 strong foundation in the theories of leadership, skills and the behaviors of strong leaders. **Table 1** lists
9 the learning outcomes for each of the workshops presented along with the Five Practices targeted.

10 For each of the practices related to the Five Practices framework, students were given a 20-30
11 minute lecture about the practice, including examples of what each may look like in practice, and
12 participated in activities and discussion aimed at strengthening that practice. **Table 2** lists the activities
13 covering each practice, which were a combination of activities in the Student Leadership Challenge
14 Activity Book¹⁴, written or verbal reflections on topics presented, and activities designed by the
15 presenters and relevant to pharmacy or pharmacy education. The first activity done in each session,
16 after the lecture and discussion portion, was one of the Student Leadership Challenge Activities. This
17 reinforced the material just taught, and gave a general example of the practices in action. For two
18 workshops, an additional activity was created to show students how leadership can be practiced in
19 activities they are already engaged in. One activity allowed students to learn and practice skills of
20 writing professional emails by identifying an item within the profession or program that they would like
21 to change. Students then practiced writing a persuasive email, using practices in “Challenge the
22 Process”, “Enable Others to Act”, and/or “Encourage the Heart” (Table 2). For the communication
23 through presentation skills activity, students were taught ways to make more effective presentations,
24 communicate more convincingly, and then asked to brainstorm ways to incorporate practices from

1 “Challenge the Process”, and/or “Enable Others to Act” to make their their formal and informal
2 presentations more effective. After each activity, a debrief discussion was held to talk about the
3 successes, failures and lessons learned during the activity, as well as how the activity targeted the
4 leadership practices students had just learned.

5 To assess learning and impact of the workshop series, two types of assessments were
6 completed. At the conclusion of each of the three workshops, students were asked to complete a
7 voluntary and anonymous survey. The survey contained a Likert scale ranking of agreement with each
8 of the learning outcomes for the workshop (1= strongly disagree; 5 = strongly agree). Additionally, four
9 questions were present on all of the surveys: (1) Previous to this session, I felt that I lacked
10 understanding of [topic of the workshop], (2) I found this session beneficial and pertinent to my
11 academic and/or post-graduate success, (3) I found the interactive portions of the workshop beneficial,
12 and (4) I plan to implement the tools learned at today’s workshop. There was also space on each survey
13 for comments. For analysis of these surveys, data were considered ordinal, and the median response
14 and interquartile range (IQR) were calculated. The percent of “strongly agree” or “agree” responses was
15 also calculated.

16 The second assessment completed was a pre- and post- series survey of the students’
17 perceptions of how often they engaged in behaviors that are illustrative of each of the Five Practices (1=
18 rarely; 2= sometimes; 3= often; 4= very frequently). Students were also asked to rate their overall
19 leadership skills (1= poor; 4= excellent). Finally, this survey contained demographic questions, including
20 gender, year in pharmacy program, education previous to pharmacy school, and leadership experience.
21 To keep responses anonymous, students were provided a folder during the first workshop that had a
22 copy of the pre- and post- series survey with a unique number printed on both copies. The folder
23 contained all workshop materials, and students were responsible for keeping the folder for the school
24 year. Students completed and submitted the pre-series survey during the first workshop, after they

1 were introduced to the introductory content related to leadership and the Five Practices framework.
2 Students completed and submitted the post-series survey at the end of the third workshop. Students
3 did not have access to their pre-series responses when completing the post-series surveys. Pre- and
4 post-series responses were matched using the unique numbers printed on each copy. Only students
5 who completed both the pre- and post-series survey were included in the analysis. For demographic
6 data, the number and percentage of each response were calculated for each question. Data from the
7 assessment questions were considered ordinal for analysis, and the median and IQR were calculated for
8 each question, as well as the percentage of responses of “often” and “very frequently”. As data were
9 paired, a Wilcoxon signed-rank test was used to determine statistical differences between pre- and post-
10 series surveys using Stata/SE version 15.1 software (StataCorp LLC; College Station, TX). Additionally, an
11 ordered logistic regression was used to determine if demographic variables (sex, year in the program
12 and/or number of leadership positions) influenced scores on survey responses. A p-value less than 0.05
13 was considered significant.

14 Assessments of student learning and impact were conducted with the approval of the
15 Institutional Review Board as an exempt study.

16

17 **Findings and discussion**

18 Average attendance at the workshops was 68 students (80 at workshop 1, 69 at workshop 2, 54
19 at workshop 3). Students from all four years in the program were represented at each workshop, with
20 the highest number of participants from the P1 and P3 years. The average response rate for individual
21 workshop survey completion was 89.3%. Forty-eight students completed the entire workshop series
22 and 43 (89.6%) completed both the pre- and post-series survey. Attendance numbers are slightly higher

1 than workshop series in previous years, and may indicate particular interest in, or deemed utility of, this
2 topic.

3 **Table 3** shows the demographic information of the students that completed the pre- and post-
4 series surveys. A majority of students were female (69.8%), in the P1 (48.8%) or P3 (32.6%) year and
5 completed pre-pharmacy curriculum only before entering pharmacy school (58.1%). Most students
6 (72.1%) had at least 1 formal leadership position in the last 5 years which was split between leadership
7 in student government (23.3%), professional/student organizations (48.8%) and at work (27.9%). The
8 gender and prior education demographics are similar to the breakdown in the school of pharmacy
9 overall. Higher attendance in the P1 and P3 years is likely a function of schedule availability and is
10 similar to the trend seen in previous years. A high number of students that chose to attend the
11 workshop had significant experience in leadership which may indicate a desire for students to be better
12 leaders in the roles they already possess. While the committee had hoped to recruit more students with
13 no prior leadership experience, only 27.9% had no formal leadership roles in the past 5 years. This may
14 indicate a high level of leadership involvement in the student population at baseline, or a reluctance of
15 inexperienced leaders to learn about the topic. Anecdotally, from post-activity discussions, students
16 expressed that they learned how leadership topics are applicable to their lives, even if they hold no
17 leadership positions. In future iterations, framing the program in this context may help to recruit more
18 students who are not currently in leadership positions, and/or have no desire to be formal leaders.

19 Achievement of the student learning outcomes for each workshop are reported in
20 **Supplemental Table 1**. The median response for all questions was a 4 (agree) or 5 (strongly agree) and
21 the percentage of students agreeing or strongly agree to each item was 85% or higher for all items
22 except two. Students had a lower agreement (84.8% agree/strongly agree) with the item “I can list and
23 describe the 5 practices of exemplary leaders” after the first workshop. A response to this result was
24 made in real-time and the five practices were reviewed at each of the subsequent workshops to

1 reinforce learning. The second item with lower scores was one of the common items asked after each
2 survey: "Previous to this session, I felt that I lacked understanding of [topic of the workshop]". This is not
3 unexpected based on the demographics of the students reported above and shows that many students
4 chose to attend the workshop series despite having previous knowledge and/or experience on the topic.

5 **Supplemental Table 2** shows the data for the pre- and post-series survey responses. Students
6 reported statistically significant gains in behavior frequency associated with Model the Way ($p=0.003$),
7 Inspire a Shared Vision ($p=0.0007$), Challenge the Process ($p=0.0002$) and Encourage the Heart
8 ($p=0.0001$). In the pre-series survey, only 37.2% of students ranked their skills as good or excellent,
9 while in the post-series survey 93.0% of students ranked their skills as good or excellent ($p<0.0001$).
10 While self-reported and subjective, these data do suggest gains in perceived leadership skills and
11 increases in the frequency of practicing behaviors of strong leaders. Ordered logistic regression of pre-
12 and post-series responses based on sex, year in the program and number of previous leadership
13 positions revealed that these demographic factors did not influence self-reported scores ($p>0.05$ for all
14 comparisons) at the beginning or end of the workshop series.

15 This program shares similarities with other published reports of student leadership development
16 programs in pharmacy education. Many have implemented programs utilizing the co-curricular space or
17 elective courses to address the challenge of time and curricular space.¹⁰ For example, a monthly
18 leadership series at Drake University College of Pharmacy and Health Sciences integrated a co-curricular
19 program to supplement curricular activities in leadership.¹⁵ The curricular component of the program
20 also utilized the Student Leadership Challenge Five Practices framework, and co-curricular speakers and
21 poster presentations reinforced the content. Students found the framework useful in the 2013 study,
22 but its efficacy was not specifically evaluated.¹⁵ Other programs take a more informal co-curricular
23 approach, offering opportunities for peer leadership, which can be a valuable learning experience.¹⁶
24 Outside of pharmacy, Warde et al. reported on a co-curricular leadership elective in a college of

1 medicine that focused on competencies of leadership, advocacy, teamwork and resiliency to build
2 student leaders.¹⁷ Other programs have chosen to utilize the required didactic curriculum to provide
3 leadership development by either assessing the current curriculum for existing leadership topics within a
4 combination of courses,¹⁸ or implementing new courses or course modules to meet the ACPE
5 standards.^{19,20}

6 The co-curricular student leadership development program presented in this report represents a
7 model that can be used by schools of pharmacy to develop student leaders outside of the curriculum. It
8 can be used to supplement existing curricular topics or as stand-alone content, but is not designed to be
9 a comprehensive education on leadership. Using an existing model of leadership that is both validated
10 and popular among many areas of higher education means that there are a number of resources readily
11 available to support the training. Assessment of this program also shows that students found it both
12 useful and effective at introducing the new leadership practices into their professional lives and raising
13 their perceived leadership skills. The impact of this may improve not only curricular outcomes, but
14 future leadership potential as well.

15 A number of lessons were learned during the implementation of this program. To help increase the
16 pool of future leaders in pharmacy, future iterations of the program will also seek to recruit more
17 inexperienced or reluctant leaders, by providing incentives and targeting students demonstrating high
18 potential for leadership or management from yearly assessments. Despite being open to fourth year
19 pharmacy students, very few participated. This may have been due to scheduling, rotations far from
20 campus, or other factors. In the future, more considerations will be made for ways to include P4
21 students. Finally, during this iteration, very little open-ended feedback was collected on individual
22 activities. Student reflection and insights were not collected, because while discussions were conducted
23 during the sessions, most student responses were not written, and those that were were not collected.

1 To better understand the impact of each activity, students could be asked to reflect on the activities in
2 writing, both for their own benefit and the benefit of the workshop itself.

3 Limitations of this study include its assessment that relies on subjective reflection. The changes
4 observed could also represent better awareness of the principles rather than true behavioral change.
5 However, even raised awareness and understanding of the consequences of effective behaviors can
6 increase their impact, and confidence in one's own leadership abilities could lead a student to seek out
7 more leadership positions. It would be beneficial for future studies to use more objective measures that
8 evaluate efficacy of the curriculum. Finally, this study was conducted on one cohort of students during
9 one year of this program. Future studies will analyze data from subsequent offerings of the program
10 and investigate the potential for conducting a follow-up survey of students upon graduation to measure
11 retention of the skills and ideas learned as well as the impact on students' careers.

12

13 **Implications**

14 Based on Kouzes and Posner's Student Leadership Challenge, this student leadership development
15 program utilizes an existing leadership model to enhance leadership skills and expose students to
16 different practices of leadership. It also introduces new ways for students to be self-aware of their
17 behaviors and the impact they have on leadership and can be easily implemented as part of a pharmacy
18 program's co-curriculum. Faculty or staff with minimal leadership background can facilitate the sessions
19 with easily accessible content in The Student Leadership Challenge book and activities book.^{11,14} Once
20 implemented, this program can meaningfully impact the leadership awareness and skills of students
21 involved, while serving as one method for schools of pharmacy to meet ACPE accreditation standards.

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1 **Table 1: Learning Outcomes for Leadership Workshops**

Workshop Title	Learning Outcomes	“Five Practices” Targeted
Understanding Your Leadership Style	<ul style="list-style-type: none"> ● Define leadership and explain how it is different than management. ● Describe different styles of leadership and traits of leaders. ● List and give examples of the 5 practices of exemplary leaders. ● Describe your leadership style. ● Identify and reflect on your strengths and weakness in different areas of leadership. 	<p style="text-align: center;">Model the Way Inspire a Shared Vision</p>
Overcoming Your Communication Challenges	<ul style="list-style-type: none"> ● Define communication apprehension and identify your own level of communication apprehension. ● Identify the causes of communication apprehension and describe ways to reduce it. ● Outline the basic principles of email etiquette, including dos and don’ts. ● Recognize and write a persuasive email and professional email advocating for change in the program or profession. ● Improve your skills in “Challenge the Process”, “Enabling Others to Act” leadership practices. 	<p style="text-align: center;">Challenge the Process Enable Others to Act</p>
Communicating Your Leadership Persona	<ul style="list-style-type: none"> ● List and demonstrate best practices for presentation skills and non-verbal communication. ● Describe ways in which different types of people are motivated and encouraged through feedback. ● Identify ways in which you have developed as a leader over the course of the workshop series. ● Improve your skills in “Encourage the Heart”, and “Model the Way” leadership practices. 	<p style="text-align: center;">Model the Way Encourage the Heart</p>

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1 **Table 2: Description and Examples of the Five Practices of Exemplary Leaders¹¹**

Practice	Examples of the Practice Provided	Activities Targeting the Practice
Model the Way	<ul style="list-style-type: none"> ● I set a personal example of what I expect from other people. ● I spend time making sure that people behave consistently with the standards and values we agreed upon. ● I follow through on promises and commitments I make. ● I seek to understand how my actions affect other people’s performance. ● I talk about my values and the principles that guide my actions. 	<ul style="list-style-type: none"> ● Hefferlump Activity¹⁴ ● Word-Picture Activity¹⁴ ● Pre- and post-workshop series reflection and discussion on personal leadership practices/style
Inspire a Shared Vision	<ul style="list-style-type: none"> ● I look ahead and communicate about what I believe will affect us in the future. ● I describe to others in our organization what we should be capable of accomplishing. ● I talk with others about a vision of how things could be even better in the future. ● I talk with others about how their own interests can be met by working toward a common goal. ● I am upbeat, positive and passionate when talking about what we can accomplish and the meaning of our work. 	<ul style="list-style-type: none"> ● Communication apprehension reflection ● Hefferlump Activity¹⁴ ● Word-Picture Activity¹⁴ ● Pre- and post-workshop series reflection and discussion on personal leadership practices/style
Challenge the Process	<ul style="list-style-type: none"> ● I look for ways to develop and challenge by skills and abilities. ● I look for ways that others can try out new ideas and methods. ● I search for innovative ways to improve what we are doing. ● When things do not go as expected, I ask “What can we learn from this experience?” ● I make sure that big projects we undertake are broken down into smaller and doable parts. ● I take initiative in experimenting with the ways things can be done. 	<ul style="list-style-type: none"> ● Communication apprehension reflection ● Writing a persuasive and professional email advocating for change in the program or profession. ● Communication through presentation skills activity
Enable Others to Act	<ul style="list-style-type: none"> ● I foster cooperative rather than competitive relationships among people I work with. ● I actively listen to diverse points of view. ● I treat others with dignity and respect. ● I support the decisions that other people make on their own. 	<ul style="list-style-type: none"> ● Writing a persuasive and professional email advocating for change in the program or profession.

	<ul style="list-style-type: none"> ● I give others a great deal of freedom and choice in deciding how to do their work. ● I provide opportunities for others to take on leadership responsibilities. 	<ul style="list-style-type: none"> ● Communication through presentation skills activity ● Non-verbal communication discussion ● New Planet Activity¹⁴
Encourage the Heart	<ul style="list-style-type: none"> ● I praise people for a job well done. ● I encourage others as they work on activities and programs in our organization. ● I express appreciation for the contributions that people make. ● I make it a point to publicly recognize people who show commitment to shared values. ● I find ways for us to celebrate accomplishments. ● I make sure that people are creatively recognized for their contributions. 	<ul style="list-style-type: none"> ● Non-verbal communication discussion ● Writing a persuasive and professional email advocating for change in the program or profession. ● Compliment Swap Activity¹⁴

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1 **Table 3: Demographics of Students Completing the Full Development Series* (n=43)**

	Number (N)	Percentage (%)
Gender		
Male	13	30.2
Female	30	69.8
Other	0	0
Year in Pharmacy Program		
P1	21	48.8
P2	7	16.3
P3	14	32.6
P4	1	2.3
Highest Level of Education Prior to Pharmacy School		
Pre-Pharmacy Curriculum	25	58.1
Associate's Degree	3	7.0
Bachelor's Degree	14	32.6
Graduate Degree	1	2.3
Formal Leadership Position Within Last 5 Years		
Students with 1 leadership position	23	53.5
Students with more than 1 leadership position	8	18.6
Student with no leadership positions	12	27.9
Type of Formal Leadership Within Last 5 Years**		
Student Government	10	23.3
Professional/Student Organization	21	48.8
At work	12	27.9

2 * Data from students who completed both pre- and post-surveys.

3 ** Students were able to select more than one option. Total % will add up to greater than 100%

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1 **Supplemental Table 1: Student Perceptions of Workshops**

2 **Workshop 1: Understanding your Leadership Style (n= 67; 84% response rate)**

Question	Median (IQR)	% Strongly Agree/Agree
Q1: I can define leadership describe different types and styles of leaders.	5 (4-5)	97.01
Q2: I can list and give examples of the 5 practices of exemplary leaders.	5 (4-5)	84.84
Q3: I am able to describe my leadership style.	4 (4-5)	89.55
Q4: I was able to identify and reflect on my strengths and weaknesses in different areas of leadership.	5 (4-5)	94.03
Q5: Previous to this session, I felt that I lacked understanding of my leadership style.	4 (3.5-5)	74.63
Q6: I found this session beneficial and pertinent to my academic and/or post-graduate success.	5 (4-5)	94.03
Q7: I found the interactive portions of the workshop beneficial.	5 (5-5)	98.48
Q8: I plan to implement the tools learned at today's workshop.	5 (4-5)	98.51

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4 **Workshop 2: Overcoming Your Communication Challenges (n=61; 88% response rate)**

Question	Median (IQR)	% Strongly Agree/Agree
Q1: I am able to define communication apprehension and identify my own level of communication apprehension.	5 (4-5)	96.7
Q2: I can identify the causes of communication apprehension and describe ways to reduce it.	5 (4-5)	100.0
Q3: I can outline the basic principles of email etiquette, including dos and don'ts.	5 (5-5)	98.4
Q4: I am able to recognize and write a persuasive email that is professional.	5 (4-5)	100.0
Q5: I improved by skills in "Challenge the Process" and "Enabling Others to Act" leadership practices.	4 (4-5)	90.2
Q6: Previous to this session, I felt that I lacked understanding of my communication challenges and/or strategies to improve.	4 (3-5)	54.1

Q7: I found this session beneficial and pertinent to my academic and/or post-graduate success.	5 (5-5)	98.4
Q8: I found the interactive portions of the workshop useful.	5 (5-5)	98.4
Q9: I plan to implement the tools learned at today's workshop.	5 (5-5)	100.0

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2 **Workshop 3: Communicating Your Leadership Persona (n=52; 96% response rate)**

Question	Median (IQR)	% Strongly Agree/Agree
Q1: I can list and demonstrate best practices for presentation skills and non-verbal communication.	5 (5-5)	98.1
Q2: I am able to describe ways in which different types of people are motivated and encouraged through feedback.	5 (4.75-5)	100.0
Q3: I can identify ways in which I have developed as a leader over the course of the workshop series.	5 (4-5)	92.2
Q4: I improved my skills in "Encourage the Heart" and "Model the Way" leadership Practices.	5 (4-5)	92.3
Q5: Previous to this session, I felt that I lacked understanding of best practices for presentations and/or methods for giving feedback.	4 (3-5)	67.3
Q6: I found this session beneficial and pertinent to my academic and/or post-graduate success.	5 (5-5)	100.0
Q7: I found the interactive portions of the workshop useful.	5 (5-5)	94.2
Q8: I plan to implement the tools learned at today's workshop.	5 (5-5)	100.0

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1 **Supplemental Table 2: Pre- and Post-Series Assessment**

Question		Pre-Test Median (IQR)	Pre-Test % 3 or 4	Post-Test Median (IQR)	Pre-Test % 3 or 4	P-value
How often do you typically engage in behaviors and actions that illustrate each of the following practice of exemplary leaders? (1= Rarely; 2= Sometimes; 3= Often; 4= Very Frequently)	Q1: Model the Way	3 (3-3)	76.7	3 (3-4)	88.4	0.003
	Q2: Inspire a Shared Vision	2 (2-3)	34.9	3 (3-4)	79.1	0.0007
	Q3: Challenge the Process	2 (2-3)	30.2	3 (2-3)	72.1	0.0002
	Q4: Enable Others to Act	3 (3-3)	79.1	3 (3-4)	81.4	0.183
	Q5: Encourage the Heart	2 (2-3)	39.5	3 (3-4)	81.4	0.0001
Q6: How would you rate your overall leadership skills today? (1= Poor; 4= Excellent)		2 (2-3)	37.2	3 (3-4)	93.0	<0.0001

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