Utilizing Biomimicry to Teach Organizational Structure, Culture, and Decision-making in an Introductory Leadership Course

Summer F. Odom
Assistant Professor
Agricultural Leadership, Education, & Communications
Texas A&M University
College Station, TX 77843
summerodom@tamu.edu
979-862-7650

Allison L. Dunn
Graduate Assistant and Ph.D. Student
Agricultural Leadership, Education, and Communications
Texas A&M University
College Station, Texas 77843
aldunn@tamu.edu
281-731-5954

Robert L. Strong, Jr.
Associate Professor
Agricultural Leadership, Education, and Communications
Texas A&M University
College Station, Texas 77843
r-strong@tamu.edu
979-862-3012

Julianna Rangel Posada
Assistant Professor
Entomology
Texas A&M University
College Station, Texas 77843
jrangel@tamu.edu
979-845-2516

Tracy Rutherford
Professor
Agricultural Leadership, Education, and Communications
Texas A&M University
College Station, Texas 77843
trutherford@tamu.edu
979-458-2744

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Introduction and Need for Innovative Idea

Historically, college students aspired to a specific job and selected the associated major to provide the needed specialized education and training. However, as the economy has shifted to a post-industrial knowledge focus, "the entire workplace ecosystem has become more fluid" (Chan, et al., 2012, p. 84). As the problems and challenges of this post-industrial world become more complex, preparing leaders who can solve these problems in new and innovative ways becomes even more important (Rosch, Collier, & Thompson, 2015). Consequently, higher education institutions continue to invest significant resources to provide opportunities for students to develop their leadership competency and capacity (Astin & Astin, 2000; Haber, 2012; Riggio, Ciulla, & Sorenson, 2003; Shertzer et al., 2005).

Even though college students typically are at the beginning of their leadership journey, many are at a developmental stage where they, “may form key motives, values, and aspects of identity that could shape their future actions and behaviors as leaders” (Waldman, Galvin, & Walumbwa, 2012, p. 158). The general applicability of the knowledge, skills, and abilities taught within a leadership major expands a student's options for employment and/or additional education after graduation; i.e. there is no traditional career path for leadership majors. This lack of specialization fits well in today's more fluid workplace (Chan, et al., 2012).

To thrive in this knowledge-focused world, students must be able to think critically and integrate what they learn across disciplines, contexts, and throughout their lives (Huber & Hutchings, 2004). This call for integrative learning in higher education is not new, yet its renewed emphasis is important as it “challenges students to think beyond their classrooms, their disciplines, their histories, or their personal identifications” (QEP, 2012, p.14). Thus, by intentionally facilitating connections between science and leadership, students are given opportunities to develop skills and competencies needed to think critically and solve problems in new and innovative ways.

Biomimicry is one innovative way to integrate knowledge across disciplines. Defined as an approach “that seeks sustainable solutions to human challenges by emulating nature’s time-tested patterns and strategies” (Biomimicry Institute, 2017, para 2), biomimicry has application beyond engineering or design. From communication to collaborative work environments, the natural world is replete with examples of sustainable practices applicable to leadership education and leader development. Yet, utilizing biomimicry in a formal leadership education setting is an emerging area; therefore, biomimicry provides a unique conceptual frame upon which students can build their leadership competency and capacity (Makin & Harrington, 2013). Therefore, utilizing biomimicry in a leadership classroom incorporates interactive technologies, occasions for individualized learning, opportunities to develop broad cognitive skills, and serves as a response to the National AAAE Research Agenda Priorities 3 and 4 to develop meaningful learning environments where students gain the broad cognitive and affective skills needed to be successful in the 21st century (Roberts, Harder, & Brashears, 2016). The purpose of this innovative idea was to introduce curricula integrating science, leadership, and critical thinking for undergraduate students completing leadership courses within a college of agriculture.

Methodology

The selected instruction methodology was interactive on-line modules incorporating leadership concepts and naturalistic solutions found in honey bees. Three undergraduate students, who had successfully completed the introductory agricultural leadership course, were selected from a pool of applicants for a one-semester paid internship to design, with the assistance of professional instructional designers, the on-line teaching modules to be used in the introductory leadership course. Each intern selected the leadership course topic(s) they believed could be easily detailed in honey bees or the honey bee colony. The modules focused on managing conflict, group decision-making, organizational structure, and organizational culture, along with an overview module introducing biomimicry as a conceptual frame. The interns worked with instructional designers, attended an entomology course, and visited a honey bee hive to develop competence for building the modules. Learning objectives were developed for each leadership topic and a written evaluation is being deigned to assess the depth of the students' learning of each topic.

Results to Date

At the beginning of the fall 2016 semester, a biomimicry expert came to campus and trained the project team and interns in the design and implementation of the on-line modules in the basic tenants and principles of biomimicry. This training provided the grounding in biomimicry the interns needed to create all four on-line, interactive teaching modules, which were then vetted by experts in leadership education, instructional design, and honey bees at the end of the semester. Now, these on-line modules have been incorporated into the curriculum of a small, pilot-test section of an introductory leadership course. This course consists of nineteen undergraduate students who are not currently enrolled as agricultural leadership majors, but are looking to declare either an agricultural leadership major or minor.

Future Plans

In response to the need to create meaningful learning environments, these modules were designed to be flexible. Instructors can use the modules in their entirety or in part, in a face-to-face course, as modules within an on-line course, or as curriculum for stand-alone trainings. A long-term goal is to find ways to integrate principles of biomimicry into other undergraduate leadership courses, such as Leadership of Volunteers, Leadership of Teams, or Leading Change. A second long-term goal is to provide access to these modules for use by other leadership educators to better prepare leaders to solve complex issues (Rosch, et al., 2015).

Resources Needed

The following resources were needed to implement this innovative idea: instructional design support for the interns, access to the computer program (Articulate), program evaluation development, a honey bee colony and protective clothing; and funding to bring in a biomimicry expert to orient the student interns, pay the student interns, as well as cover the cost of the critical thinking assessment for the students enrolled in the pilot-test section of the introductory leadership course. The total cost was approximately $22,000. The greatest cost was the interns' wages, with the second greatest cost being the biomimicry guest speaker and training.

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