Wicked Leadership Competencies for Sustainability Professionals: Definition, Pedagogy, and Assessment

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Wicked Leadership Competencies for Sustainability Professionals: Definition, Pedagogy, and Assessment

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ABSTRACT

Sustainability professionals need specialized leadership competencies to effectively influence the complex, uncertain, conflicted, and dynamic (i.e., wicked) sustainability challenges of our time. Higher educational programs can teach these leadership competencies and thus help professionals gain more influence and career success. This paper does three things: 1) defines and justifies leadership competencies sustainability professionals need to address wicked challenges, 2) describes a pedagogy to teach these competencies to professionals, and 3) evaluates whether intended learning outcomes were achieved in applications of this pedagogy.

INTRODUCTION

Even when technological solutions exist to address sustainability challenges, lack of leadership can prevent their implementation. In response, prominent professional societies (e.g., National Association of Environmental Managers, International Society of Sustainability Professionals, Ecological Society of America) as well as numerous universities now offer programs to teach leadership competencies to sustainability professionals.¹⁻³ Not surprisingly, there is debate about what leadership definitions, theories, and practices are most relevant for sustainability challenges.³⁻⁸ This paper contributes to this body of work by proposing and assessing a specific set of leadership competencies sustainability professionals need.
in order to address the distributive, collaborative, and adaptive dimensions of wicked situations.

In the section immediately below, we define a theory and type of leadership relevant to sustainability professionals confronting wicked challenges. Then, in the next section, we describe an education program designed to teach leadership competencies to working professionals engaged in environmental and sustainability careers. In the last section of this manuscript we evaluate the success of that program.

**LEADERSHIP for SUSTAINABILITY**

Leadership is a celebrated topic discussed in countless journals, self-help books, and professional development programs and is taught extensively in business, public administration, and military curricula. The core concepts—the ontology—of traditional leadership theories include a leader, followers, and the things leaders get followers to follow. Hence, traditional leadership theories emphasize attributes and actions of leaders (i.e., leaders are authentic, charismatic, honest, empathetic, visionary, servants) and how they motivate followers (e.g., through transformative motivation or transactional exchange). This focus on leaders and their characteristics has been popular and effective but, we and others argue, it is less appropriate for wicked sustainable development challenges.
Instead, we recommend (and teach) the theory and practices of shared leadership. This leadership theory uses a different ontology where the basic elements of leadership are direction, alignment, and commitment. When these three things occur, leadership has occurred. Direction results when stakeholders agree on goals and strategies to achieve these goals. Alignment results when stakeholders coordinate resources to implement the strategies to achieve those goals. Commitment results when stakeholders willingly work toward those goals, even at some sacrifice to self-interest. When all three outcomes—direction, alignment, and commitment—are present, then group action occurs, is effective, and can be sustained. This ontology shifts attention from attributes of leaders to the practices of stakeholders that promote direction, alignment, and commitment. Importantly, everyone can learn, apply, and improve upon practices that make direction, alignment, and commitment occur; that is, everyone can lead from where they are.

Leadership guru Ronald Heifetz offers us a thought experiment to illustrate the critical difference between shared versus leader-follower theories of leadership: Imagine the different responsibilities and outcomes that occur when stakeholders assume that leadership means they will follow a leader’s vision versus assuming that leadership means influencing one another to face shared challenges. In the leader-follower ontology, vision of the desired future condition comes from the leader and if something goes wrong with that vision or the process leading to it,
fault lies with the leader. In the shared leadership model, goals emerge from the stakeholders who must hold themselves accountable for the future they create and the process for creating it.

Many sustainable development challenges fall into a class of “wicked” problems. Wicked problems are open-ended, conflict rich, unique, dynamic, and resist definition. We and others argue that the shared leadership ontology/theory is more appropriate for the wicked problems. Below, we focus on the distributive, collaborative, and adaptive dimensions of wicked problems.

**Distributive:** Many of the most pressing sustainability challenges and opportunities, such as climate change and supply chain risks, are distributed across vast, complicated, tele-connected, and sometimes global systems. No “leader” has authority over all the stakeholders who must be engaged because stakeholders reside in different organizations and nations. Most actors will neither meet nor interact. Many will not even realize they are connected. Nonetheless, coordination must occur across these different scales of political, economic, and ecological units, crossing boundaries of space, time, culture, and politics as solutions emerge, falter, and/or scale.

**Collaborative:** Sustainability challenges require the exceedingly difficult and stressful work of collaboration among people that have different assumptions,
values, cultures, disciplines, and organizational obligations. Stakeholders often don't agree on what the situation is or what to do about it, and they may resist or ignore those who attempt to define it for them. Stakeholders must do this difficult work themselves; it can't be done for them by a “leader.” They must voluntarily explain, defend, and develop shared interests and positions if commitment is to be sustained.\textsuperscript{13,14}

\textit{Adaptive:} Sustainability challenges require being adaptable to continual change and high uncertainty. The rate of technological, social, and environmental change has never been greater.\textsuperscript{16} Moreover, stakeholders are unpredictable. They change as they encounter and learn about new conditions and new opportunities.\textsuperscript{14} Their changed values and new goals trigger feedback loops that create new, unique system dynamics that require new interventions and course corrections that in turn require continuous re-engagement, learning, and compromise. Causation will be unknowable and control impossible in these dynamic and emergent conditions, making less effective rational problem-solving leadership styles that rely on mobilizing stakeholders to analyze, predict, and control situations. Instead, we need leadership approaches that put the burden on stakeholders for learning-by-doing, which requires transparency, communication, failing, and adapting.\textsuperscript{17}
Note that we further elaborate on the meaning of distributive, adaptive, and collaborative leadership below (see Table 1) when we describe how we teach this content and how we assess whether learning occurred.

THE PEDAGOGY

Our program, like other curricula reviewed by Shriberg and MacDonald, explicitly integrates leadership into a graduate-level sustainability curriculum targeting working professionals. We describe below, in broad outlines, the structure of that program, then we discuss key aspects of the pedagogy related to distributed, collaborative, and adaptive leadership.

Beginning in 2010, we designed a cohort-based, executive graduate program for students with diverse academic, disciplinary, and professional backgrounds. Students are typically mid-career professionals (age range is 25-65; average age is 40) and currently employed with at least three years of professional work experience. Cohort sizes range from 20 to 32 with roughly equal representation from each of three sectors: business, government, and civil society. The approximately one-year program meets face-to-face one weekend a month, typically near Washington, DC, where students engage with their peers, faculty, guest experts, and project clients. In the intervals between meetings, the hybrid curriculum
includes asynchronous online learning units and synchronous virtual teamwork on projects.

The multidisciplinary program begins with a “boot camp” to bring everyone up to the same level of understanding of sustainable development concepts, communication skills, systems thinking, and leadership tools commonly found in other programs. The program takes a deep dive into leadership practices relevant to the different levels of social interaction where sustainability professionals work: individual, team, organization, network, and societal scales (Table 1 contains more detail). The program then paces students through a series of learning modules about the science and the leadership of sustainable development challenges in the US (e.g., water, climate, energy, food and agriculture, urbanization, supply chains). The program concludes by providing a global perspective, including international travel and project work. Projects, speakers, clients, and experts represent a mix of government, business, civil society perspectives. Throughout the program, students also focus on expanding their professional networks, refining their career plans, and advancing an independent study project designed to complement their professional development goals.

The program is divided into monthly modules with four main parts: 1) reading and prep-work done remotely; 2) an intense, face-to-face meeting with peers, faculty,
experts, clients and time to do team work, practice leadership, and interact socially;
3) teamwork and study time to complete project analysis, priority setting, and to
prepare deliverables; and 4) formal reflections about lessons learned that can
generalize to their careers. We use pedagogies that are problem based\textsuperscript{18,19} require
shared inquiry\textsuperscript{19} create opportunity to be reflective about lessons being learned\textsuperscript{20}
and provide multiple touches on key topics so students can work through the
learning cycle\textsuperscript{19}. Thus, our program shares the common attributes that Shriberg and
MacDonald found in their survey of programs: network building, project-based
learning, and systems thinking\textsuperscript{3}. Importantly, the experiential pedagogy provides
students a safe space to try out and practice leadership tools, roles, and styles.

Table 1 lists the leadership competencies related to distributive collaborative, and
adaptive leadership (many other competencies are targeted but not discussed here).
Importantly, we focus less on attributes of leaders and more on leadership practices
that facilitate direction, alignment, and commitment.

The rows in Table 1 distinguish among three types of leadership competencies:
awareness, tools, and network. Leadership begins with \textit{awareness} of self and others.
To influence others, you need to first know your own traits, tendencies, biases,
values, and assumptions so you can then recognize, understand, and, manage those
attributes in others. We provide and interpret diagnostics designed for this
purpose. Tools are frameworks, best practices, and approaches that people use to facilitate leadership outcomes. They are tools in the sense that they fit different situations, produce different outcomes, and are stored in a metaphorical toolbox to be brought out and applied as need arises. We assume that a person’s leadership competency increases with the more tools they know and the more practice they have using those tools. A network further enhances a person’s leadership competencies because it provides access to role models, mentors, peers, opportunities, support, feedback, and just-in-time useful information.

Limitations of space and reader interest prevent full descriptions of all table entries. We have selected one leadership competency from each column (noted in bold in Table 1) for elaboration in text below.

Table 1: Selected Leadership Competencies

<table>
<thead>
<tr>
<th>Outcome Type</th>
<th>Distributive</th>
<th>Collaborative</th>
<th>Adaptive</th>
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<tbody>
<tr>
<td>Awareness (of self and others)</td>
<td>• Influence without authority style</td>
<td>• Personality, values</td>
<td>• Learning style</td>
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<td></td>
<td>• Control and inclusion</td>
<td>• Cross-cultural awareness</td>
<td>• Conflict styles</td>
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<td></td>
<td>profile</td>
<td>• Transdisciplinary</td>
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<tr>
<td></td>
<td></td>
<td>• Interdisciplinary</td>
<td></td>
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<tr>
<td>Tools</td>
<td>• <strong>Collective Impact</strong></td>
<td>• <strong>Cross-sector partnering</strong></td>
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<tr>
<td>(frameworks, best practices, approaches)</td>
<td>• Community of Practice</td>
<td>• Boundary spanning leadership</td>
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<td></td>
<td>• Scaling up innovation</td>
<td>• Ladder of abstraction</td>
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<td></td>
<td>• Systems mapping</td>
<td>• Fist-to-Five</td>
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<td></td>
<td>• Social media</td>
<td>• Yes-And</td>
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<td>• Storytelling</td>
<td>• Team principles</td>
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<td></td>
<td>• Impact words and</td>
<td>• Project management</td>
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<td></td>
<td>writing</td>
<td>• Conflict facilitation</td>
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<td></td>
<td></td>
<td>• Negotiation</td>
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<tr>
<td>Network</td>
<td>• Examples of exemplary</td>
<td>• Examples of exemplary</td>
<td></td>
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<tr>
<td>(peers, opportunities,</td>
<td>professionals who discuss</td>
<td>professionals who discuss</td>
<td></td>
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<tr>
<td>information)</td>
<td>their careers and influence</td>
<td>their history and success</td>
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<td>in terms of</td>
<td>due to collaboration</td>
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<td>• Examples of exemplary</td>
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<td>professionals who discuss</td>
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<td>their ability to work with</td>
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<td></td>
<td></td>
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<td>uncertain and dynamic</td>
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Distributive leadership using Collective Impact: The Collective Impact method is a set of best practices that help coordinate people distributed across space and time, working in different organizations, who may never meet one another. Successful efforts at generating collective impact tend to share five conditions: common agenda, shared measurement, mutually reinforcing activities, continuous communication, and backbone support. Practicing distributive leadership such as Collective Impact is difficult to replicate within the limitations of academic semesters, especially when students have full-time jobs and are geographically separated. So, to teach it, we tap into ongoing efforts and use problem-based learning pedagogies. For example, we visit a city where a multi-stakeholder collaborative effort is attempting to reduce carbon emissions. We study how multiple actors, organizations, and public and private programs coordinate their efforts, including green building programs, transit oriented development, renewable and low carbon fuels, district energy, and “green games” to motivate business and household conservation. We meet with key stakeholders and have them describe their processes, successes, and struggles. We assign students a consultancy-like
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project using the Collective Impact tool to analyze and suggest improvements to the processes.

**Collaborative leadership through cross-sector partnering:** Challenges such as climate change are not only beyond the scope of individual organizations, they are beyond the scope of any single sector (i.e., business, government, or civil society). Solutions therefore require, among other things, cross-sector, inter-organizational partnering. Partnering best practices include doing due diligence on partners’ strengths and risks, establishing mutually beneficial shared goals, creating a learning culture, and designing governance structures that are transparent and hold actors accountable.\(^{22}\) We teach these best practices using shared inquiry and problem based learning pedagogies. We identify an ongoing innovative cross-sector partnership addressing a sustainability challenge and ask students to use partnering best practices to study and critique the partnership’s efforts. We bring into the classroom a partner from each sector (business, government, and civil society) to discuss their roles, motivations, and partnering tips and challenges. Students prepare a report for these “clients” summarizing observations, recommendations, and lessons learned.

**Adaptive leadership through sense-making:** Rational problem analysis and reductionism don’t work well when confronted with the immense complexity,
uncertainty, and dynamism of major sustainability challenges. Sense-making is an alternative and more appropriate approach for these highly uncertain, contentious, wicked challenges. It avoids analysis paralysis of rational planning by emphasizing actions that help make sense of a situation rather than expecting to eliminate uncertainty, impose control, and solve the problem. We teach a method of sense-making that maps stakeholders’ concerns and influence, the strategies they use to affect change, the system properties and feedback loops where leverage can be exercised, and the outcomes used to guide and evaluate success. For example, students engage in a several month effort to make sense of a project identified by faculty as demonstrating leadership for sustainability. The exercise requires students to quickly become familiar with a situation new to them (most projects are based in rapid developing countries such as India and China). They begin with desk research using reports by stakeholder organizations, and follow with email and phone interviews, as well as a site visit to ground truth and dig deeper.

**LEARNING OUTCOME ASSESSMENT**

In this section we discuss the method used to assess whether the program and pedagogy produce meaningful learning outcomes.
An online survey was administered several weeks before students entered the program and several weeks after they completed the program. Pre-post paired t-tests were used to evaluate changes in student perceptions of these leadership competencies.

The specific survey questions used to operationalize learning outcomes are listed in Table 2. For each competency, students were asked to evaluate its importance (How important is this topic/skill for your success and impact as a sustainability professional?) and performance (How well do you perform or understand this topic/skill?). Students answered the questions on a 5 point Likert scale with 1 being least important or having the least understanding to 5 being the most important and having the most understanding. The three sets of leadership learning outcomes—distributed, collaborative, and adaptive—are so broad and diverse that no attempt was made to develop psychometric indicators with multiple items for each concept. Such an assessment would have been unwieldy given we also assessed several dozen other learning outcomes not reported here. Hence, a limitation of the study is the limited reliability of single-item measures and further limited by self-perceptions of these learning outcomes.
We surveyed two cohorts of students, 29 who graduated in 2016 and 28 who graduated in 2017. In total, 55 students completed both the pre- and post-survey.

The results of the pre-post comparison are reported in Table 2.

Table 2: Learning Outcome Assessment

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Importance</th>
<th>Performance</th>
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<tr>
<td>Ability to practice leadership without having authority or power over others.</td>
<td>4.6 4.9</td>
<td>3.4 .001</td>
</tr>
<tr>
<td>Ability to enhance learning across a network of actors from different organizations and locations.</td>
<td>4.4 4.6</td>
<td>2.4 0.2</td>
</tr>
<tr>
<td>Ability to scale up solutions that work in one situation so they spread and work in other situations.</td>
<td>4.4 4.6</td>
<td>1.0 0.3</td>
</tr>
<tr>
<td>Personal confidence to dive into complex projects full of uncertainty and conflict.</td>
<td>4.4 4.8</td>
<td>3.2 .002</td>
</tr>
<tr>
<td>Ability to manage teams that tackle complex, ambiguous problems that resist definition.</td>
<td>4.5 4.8</td>
<td>2.6 .012</td>
</tr>
<tr>
<td>Understand feedback loops, uncertainties, nonlinearities, intractable value conflicts, and other attributes of complex, adaptive systems.</td>
<td>3.8 4.3</td>
<td>3.1 .03</td>
</tr>
<tr>
<td>Ability to understand teammate motivations and characteristics and use this information to enhance teamwork.</td>
<td>4.5 4.8</td>
<td>2.5 .015</td>
</tr>
<tr>
<td>Ability to build and maintain trust among others.</td>
<td>4.6 4.9</td>
<td>3.4 .001</td>
</tr>
<tr>
<td>Ability to collaborate with actors from business, government, and civil society.</td>
<td>4.6 4.9</td>
<td>3.3 .002</td>
</tr>
<tr>
<td>Ability to identify, analyze, map, and prioritize stakeholders’ interests and resources.</td>
<td>4.5 4.8</td>
<td>3.1 .04</td>
</tr>
</tbody>
</table>

Paired t-tests were calculated independently for each leadership attribute to compare students’ perceptions prior to the graduate program (pre) with their perceptions upon completing the program (post). “Importance” refers to how important is this leadership capacity to being a successful and impactful sustainability.
professional. “Performance” refers to student’s self-assessment of how well they personally possess that ability to produce that outcome. The scale ranges from 1 (low) to 5 (high).

Prior to beginning the graduate program, most students recognized the importance of distributed, collaborative, and adaptive leadership competencies. The average rating for each item was above 4 on a 5-point scale. Despite initial ratings that left little room for improvement, importance ratings did increase when the survey was repeated at the end of the graduate program. Although the increases were small (i.e., from 4.6 to 4.9 on a scale of 5), most changes were statistically significant.

Student’s ratings of their performance on each competency increased dramatically from pre to post program. Without exception, these increases were statistically significant. Performance increase by more than 20% on half of the learning outcomes (i.e., a 1-unit increase on a 5-point scale such as from 3.1 to 4.2). These results suggest our pedagogy was successful. Students’ self-assessments of their ability to perform distributed, collaborative, and adaptive leadership practices increased. While successful, our pedagogy has room for improvement. In the years ahead, we aspire to post-program performance closer to 5 out of 5.

CONCLUSION
The main contribution of this paper is our attempt to define a subset of leadership practices and competencies that help sustainability professionals address wicked challenges. We argue that the Direction-Alignment-Commitment ontology and theory of shared leadership are appropriate for the wicked situations typical of sustainability challenges. Further, we argue that sustainability professionals will be more influential and relevant to these challenges if they have a tool box of leadership practices designed to address the distributive, collaborative, and adaptive aspects of wicked challenges. Importantly, we also argue that all stakeholders can help facilitate direction, alignment, and commitment. Thus, everyone can lead from where they are, not just those in a position of authority or designated as a leader.

The graduate program we developed helps working sustainability professionals master this leadership theory and related practices and competencies (the program also emphasizes many other learning outcomes not discussed here). In this paper, we discussed a subset of the leadership competencies we teach and evaluated student perceptions of lessons learned. We found that the program delivers positive outcomes: students finished with an increased appreciation for the importance and an increased confidence in their ability to perform distributed, collaborative, and adaptive leadership practices. Of course, these findings are limited by data derived
from student self-reports, so subsequent studies should focus on, for example, how often and how well graduates use these skills in their day-to-day work.

There exists a large literature and deep tradition of leadership education that sustainability professionals and educators can draw on. We see great potential in additional bridge-building between leadership and sustainability literature, especially as it applies to wicked problems. We advocate continued vigorous debate about which leadership theories, ontology, and practices are most useful for sustainability professionals and what pedagogies work best to build leadership competencies.
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