

# Learning for the Future: Exploring Effective Characteristics of Sustainability Leadership Programs in Higher Education

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*Abstract: In response to global environmental, economic, and social issues, universities and colleges have begun to create and expand leadership courses and programs that aspire to foster sustainability change agents. This literature review explores these courses and programs in greater detail and identifies the characteristics they share. In doing so, it maintains a common focus on education that is collaborative, experiential, and transformative while providing examples of effective pedagogies, skills, and learning outcomes that support these themes. This review contributes to emerging research on best practices for sustainability education and can potentially provide insights for sustainability educators, researchers, and students at the post-secondary level.*

*Keywords: Sustainability Leadership, Higher Education, Experiential Learning*

## Introduction

In today's world, the threat of intersecting ecological, economic, and social concerns is becoming more and more imminent. Such threats include, but are not limited to, swift environmental decline, societal inequity, income inequality, depletion of resources, climate change, and adverse impacts from the COVID-19 pandemic (United Nations, 2020). These grievous dilemmas require sustainability solutions that meet present needs without depriving the needs of future generations (WCED, 1987). Due to their capacity to educate leaders, produce impactful research, and influence cultures, Higher Education Institutions (HEIs) have long been considered as important players in the sustainability movement (Kistner et al., 2020; Universities Canada, 2021). In recent years, several institutions have risen to the challenge of creating sustainability leadership courses and programs that aim to train students to become change agents capable of addressing 'wicked' problems (Gough et al., 1998; Shriberg & MacDonald, 2013). However, researchers assert that a stronger curriculum focus on sustainability is needed (Vaughter et al., 2016) and that the rate at which sustainability education is being integrated in higher education is not enough to achieve societal transformations (Michel, 2020). This suggests that further efforts are necessary to ensure sustainability leadership courses and programs have the capacity to tackle complicated global issues.

Instilling change in sustainability education curricula is a complex process with no single formula for success (de la Harpe & Thomas, 2009). This can be explained by the fact that, despite their perceived value, there is a lack of empirical and in-depth research investigating pedagogical practices for teaching sustainability within higher education (Michel, 2020; Sandri, 2020). Researchers that offer detailed lists of best practices for informing pedagogy in sustainability and sustainability leadership education have noted the scarcity of guiding frameworks and methods (Shriberg & MacDonald, 2013). In addition, previous research seldom addresses the skills and learning outcomes for sustainability leadership outside of specific program contexts (Stewart, 2010). This is a challenge considering the identified need to foster leaders across diverse disciplines, workplaces, and communities (Ferdig, 2007). In contrast to the assumption that educators can intuitively navigate new pedagogical practices and educational design for sustainability (Sandri, 2020), difficulties arise from limited time for planning, challenges developing sustainability content, and uncertainty about sustainability issues (Kaza et al., 2016). Considering these difficulties and limited prior research, there is a need for a review outlining consistent and effective pedagogies, skills, and learning outcomes to guide educators in the facilitation of sustainability leadership education.

This review will therefore examine literature on sustainability leadership offerings in higher education that have emerged within the last ten years in North America, Europe, and Australia. In doing so, it will contribute to gaps in research and provide informed insights for educators by identifying the practices, skills, and learning outcomes utilized to develop competent sustainability leaders (see Figure 1). This review focuses on examples from three types of learning that have proven to be successful in prior studies:

1. Collaborative learning – Learning within and among groups (Laal & Laal, 2012);
2. Experiential learning – Learning by doing (Favaloro et al., 2019); and
3. Transformative learning – Learning as the process of changing or acting on one's perspectives, values, and feelings (Mezirow, 2000).

This review will begin by defining sustainability and sustainability leadership. It will then discuss collaborative, experiential, and transformative pedagogies, skills and learning outcomes before briefly exploring findings from sustainability leadership alumni experiences. It concludes by summarizing key implications that have significance for current and future education.

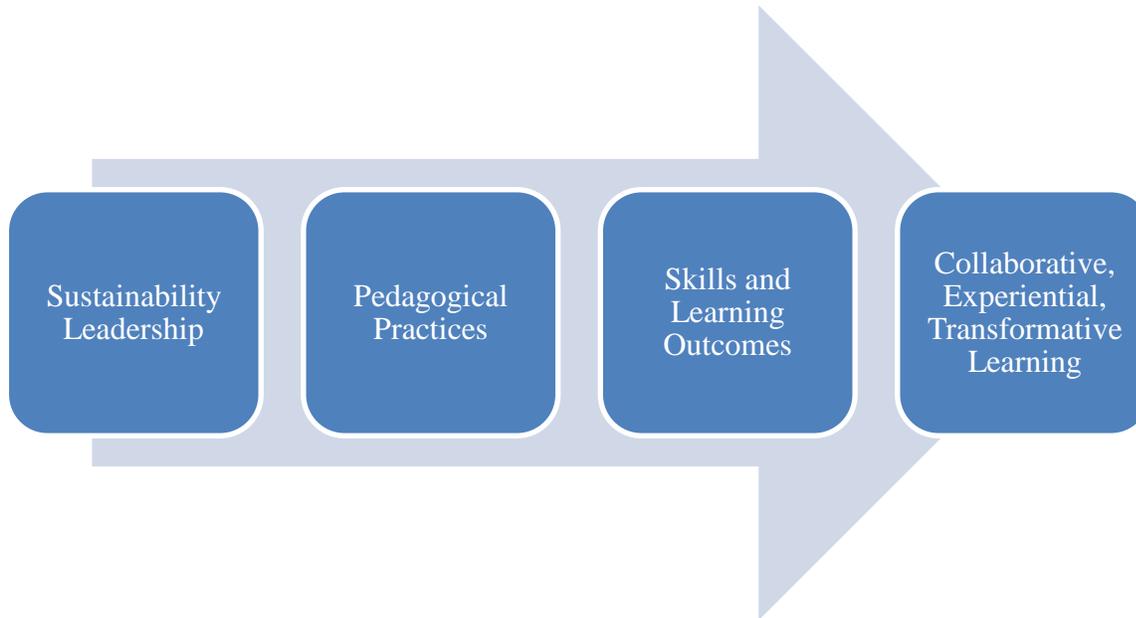


Figure 1. Literature Review Framework

## Defining Sustainability and Sustainability Leadership

The United Nations World Commission on Environment and Development (WCED) report (1987) defines sustainability as meeting “the needs of the present without compromising the ability of future generations to meet their own needs” (p. 16). The report frames economic growth, environmental impacts, and social issues as interconnected systems, meaning economic development must be balanced with social justice and ecological wellbeing (Nolet, 2009; WCED, 1987). Consequently, each of these three systems were imbedded in the creation of the United Nations Sustainable Development Goals (SDGs), a comprehensive list of 17 goals and 169 targets. By 2030, the SDGs aim to tackle climate change and preserve a healthy planet while promoting economic productivity and addressing critical social challenges (Purvis et al., 2019; United Nations, 2020).

According to Ferdig (2007), sustainability leadership “reflects an emerging consciousness among people who are choosing to live their lives and lead their organizations in ways that account for their impact on the earth, society, and the health of local and global economies” (p. 1). Although this process begins with challenging one’s own deeply rooted patterns of behaviour, it is critical that leaders spearhead change on a wider scale by inspiring others to do the same (Missimer et al., 2013). In the context of education, sustainability leadership refers to the acquisition of several outcomes that revolve around (a) an awareness of sustainability problems, (b) skills to participate in settling societal and ecological issues, (c) the development of sustainable qualities and attitudes, and (d) a belief in one’s ability to make a difference (Savage et al., 2015). This understanding that sustainability leadership prioritizes concrete actions and a forward-thinking mindset over an accumulation of knowledge provides a framework for many of the pedagogical strategies, skills and learning outcomes examined in the sections that follow.

## Pedagogical Practices

Findings gathered from studies on various sustainability leadership courses in higher education indicate the importance of integrating pedagogies with a focus on collaborative, experiential, and transformative learning. These include community-building exercises and group-action projects, student-led workshops and games, place-based learning,

service learning, and critical reflections. Though unique, these pedagogical approaches share a common emphasis on active over passive methods of education, expressing the need for traditional sender-receiver learning models to be amended (Ayers et al., 2020; Lozano et al., 2019; Wiek & Kay, 2015).

### **Collaborative Learning**

Research has shown that pedagogical practices that promote collaboration can help to improve students' sustainability awareness and values. Burns' (2016) investigation of how pedagogy can cultivate sustainability leadership in university settings revealed that creating a sense of community and peer-to-peer learning were two of the most effective strategies in developing students' understanding of sustainability. They conceptualized this discovery by explaining that pedagogical practices such as opening circles, community-building exercises, and group assignments allowed participants to recognize their individual talents and gain a better idea of how projects on local sustainability organizations could be accomplished through teamwork. These insights are similar to those presented in an article by Savage et al. (2015), who found that students in a Sustainability Leadership Certificate (SLC) program at Dalhousie University relied on community-development activities that included workshops and group action-projects to support and strengthen their sustainability values. This keen concentration on collective learning deviates from teaching methods in traditional leadership courses, which often target the improvement of individual qualities while focusing on the evolution of singular leaders (Shriberg & MacDonald, 2013).

The second and subsequent paragraphs in sections are indented by .25 inches. Collaborative pedagogies can also prepare students to productively interact with groups of diverse peers, a necessary component in addressing complex sustainability challenges (Hull et al., 2018). For example, Virgo et al. (2015) note that in Plymouth Business School's Collaborative Leadership for Sustainability (CLS) program, a collaborative pedagogical tool known as a "consensus workshop" is utilized near the beginning of the program to come to an agreement on a topic by incorporating each workshop members' ideas and priorities. The researchers assert that participating in the consensus workshop helps students to build trust, deepen their awareness and understanding of diverse perspectives, and recognize how these diverse perspectives relate to their own. Comparable results may arise from collaborative games, as was seen in Despeisse's (2018) study on the use of a boardgame called *Factory Heroes* for sustainability leadership in manufacturing. According to Despeisse (2018), playing the boardgame, which involved collaboratively implementing eco-efficiency practices at a simulated manufacturing company, allowed students to gain a deeper awareness of other players' views, dialogue, and the need for negotiation in reaching sustainability goals. These findings suggest that peer-mentoring and activities that promote reciprocity between students may be a valuable addition to collaborative teaching and learning approaches.

Pedagogical practices that enable students to collaborate with outside stakeholders in addition to their peers are also highlighted as effective in the literature, such as in the case of solution-oriented sustainability learning (SOSL) at Arizona State University (Wiek & Kay, 2015). An integral component of SOSL involves training students in stakeholder engagement and interdisciplinary teamwork in order to address real-world sustainability challenges and lead the discovery of tangible solutions. Students are required to collaborate in participatory problem-solving environments with learners from diverse disciplines as well as experts from government, business, and civic society. Wiek and Kay (2015) reported that students who participated in SOSL demonstrated appreciation for the pedagogical approach, explaining that collaborations with their interdisciplinary team and with external stakeholders promoted successful interactions among diverse parties and prepared them to navigate communications with those who were unsupportive of sustainability work. These opportunities to partner with individuals in community contexts are particularly important for students entering the workplace, as covered in further sections that look at experiential and transformative learning.

### **Experiential Learning**

In addition to pedagogical strategies that emphasize collaboration, offering experiential learning emerged as an effective instructional practice within prior research on sustainability leadership. According to Dewey (1938), experiential learning involves a continuum of experiences that, when executed correctly, will move students toward a place of positive growth. While reviewing a Masters-level sustainability leadership program, Missimer et al. (2013) stressed the need for sustainability education to progress from transmitting cognitive knowledge to developing

leadership experiences that can aid students in making positive contributions to society. The authors add that, in order to promote this progression, teaching staff intentionally push students to consider the practical implications of their learning during in-class dialogue as well as in comments written on their reflective essays. Burns' (2016) study, however, employed a case-in-point pedagogical approach to engage students in a more palpable example of experiential learning. In the case-in-point project, students were to design and implement a plan for heightening awareness of their university's Learning Gardens Laboratory, a process that encouraged them to experientially cope with leadership, teamwork, and organization while working to make a meaningful difference in their university. Burns (2016) pointed out that, although the case-in-point project proved itself to be a powerful learning activity, students verbalized their desire for some degree of structure and assistance from their instructor. These comments suggest the need for a pedagogical space where students have the ability to control their own learning experiences as well as the instructional support to help guide them in their journey towards sustainability leadership.

Pedagogical approaches such as place-based learning that allow students to practice experiential learning in spaces beyond the classroom are also important. As reported by Semken (2012), place-based learning is "situated in places, which are spatial or physical localities that are given meaning by human experience in them or relating to them" (p. 1). Within sustainability education, these places may range from natural environments to campus settings and beyond (Favaloro et al.; Prince, 2016). A growing demand for place-based learning can be surmised from Plymouth University's "students as partners" initiative, which aims to incorporate students' voices and experiences within education for sustainability by allowing them to participate in a shared leadership process of designing undergraduate modules (Warwick, 2016). Data from 52 of these students indicated the need for an increase in real-world spaces and suggested that future leaders require a wider use of place-based learning and community connections where they can witness sustainability practices in local organizations.

Similar to place-based learning, community service learning that offers students the opportunity to work within an existing community environment has been associated with sustainability competences. According to the Lozano et al. (2019), survey results from 390 European educators showed that pedagogical methods such as community service learning were most likely to promote the development of a wide array of sustainability competences including personal involvement, empathy, and strategic action. On the other hand, traditional lecturing and case studies were seen as being least likely to develop the same competences. This finding indicates that experiential learning that engages students in authentic community issues is preferable to learning about these issues from educators.

### **Transformative Learning**

A final, but significant theme that materialized in the literature on effective pedagogies for sustainability leadership is the need for transformative learning. According to Mezirow, transformative learning is a process where individuals shed their problematic beliefs and habits in order to become more open and willing to change, highlighting the importance of expanding one's thoughts and, at times, challenging one's values and ideas (Mezirow, 2003; Wolff & Ehrstrom, 2020). As such, specific pedagogical approaches for transformative learning include those that inspire critical thinking, critical discussion, and personal growth. Missimer et al. (2013) affirmed that students in the previously mentioned Masters-level sustainability leadership program benefited from frequent opportunities to engage in self-reflection, particularly in the form of weekly 2000-word reflection papers on course topics they deemed meaningful or provocative. To encourage students to confront their views and take risks, instructors in this program did not assign grades to the reflections, but rather wrote thought-provoking questions and comments on each student response. In this sense, much of the student's transformation in this program was facilitated by educators, a position that is supported by Wolff and Ehrstrom's (2020) claim that the role of the educator, specifically in raising critical concerns and asking for compelling arguments, represents a key pedagogical tool in the learning of sustainability leadership.

Benefits of reflective pedagogies within sustainability leadership education are similarly recognized in Ayers et al.'s (2020) case study, which explored two pedagogical tools that promote reflective learning in a Master's in Strategic Leadership towards Sustainability (MSLS) program in Sweden. The tool titled *Portfolio* asked students to individually reflect on their development of particular skills and on a variety of questions surrounding personal reactions to weekly course themes. The tool titled *Pod*, on the other hand, required students to participate in a collective reflection with their peers and program staff each month. During the *Pod*, students engaged in the co-creation of each

reflection session by sharing pieces of their learning journeys and posing their own questions. Key findings gathered through student course evaluations indicated that the *Portfolio* and *Pod* contributed to learners' sustainability leadership by supporting their personal and collective transformation, developing their self-awareness and sense of empathy, helping them to become more comfortable with diverse perspectives, and providing practice for critical thinking (Ayers et al., 2020). These findings are supported by Ralph's (2015) research on sustainable leadership development, which asserts that engaging in reflective pedagogies enables "a process of self-observation self-evaluation" (p. 2) whereby leaders can analyze their actions, adapt to new circumstances, and transform outdated leadership approaches.

The emphasis on collaborative, experiential and transformative teaching and learning practices within sustainability leadership points to the need for experiences that immerse diverse students within real-world environments in a way that promotes cooperation and transformation. Though discussed separately, it is important to note that these three pedagogical approaches may be merged within sustainability leadership curricula. For example, an experiential learning activity in the community could involve groups of students working collaboratively to observe and determine solutions to a sustainability issue. Following the activity, students could take part in individual or group reflections that encourage critical analysis of their experiences. Moving forward, this review will explore skills and learning outcomes in sustainability leadership education before switching focus to assess their impact on alumni.

## Skills and Learning Outcomes

A review of the learning outcomes and skills cultivated in sustainability leadership education uncovers a persistent focus on collaborative, experiential, and transformational learning. Collaborative skills and learning outcomes concentrate on effective communication, engaging others in sustainability efforts, and the capacity to work well within diverse groups. Experiential skills and learning outcomes revolve around solving sustainability problems in students' communities and incorporating informed decisions in day-to-day life. Transformative skills and learning outcomes often rest on students' ability to participate in processes of self-criticism and self-development.

### Collaborative Learning

The perplexing and multidisciplinary nature of sustainability challenges like climate change and poverty underscore the need for students to be proficient collaborators. In a study analyzing the main skills for sustainability leadership across 50 university programs, Shriberg and MacDonald (2013) determined that effective communication between students and their peers was viewed as a critical learning outcome. One program director commented that a student could be a highly efficient leader with a variety of talents and pertinent knowledge, but if they lacked the ability to communicate the importance of getting involved in sustainability issues, they would ultimately "fall flat" (Shriberg & MacDonald, 2013, p. 13). This comment, which speaks to the significance of prompting others to take action through communication, suggests that articulating, negotiating, and championing for one's cause could be considered key sustainability leadership skills. Evidence of the need for these skills is reflected in a study by Filho et al. (2020) designed to capture the main characteristics of university sustainability leaders in 29 countries. Self-evaluations completed by these leaders indicated that the most important sustainability leadership skills they felt they possessed were "Challenge and innovate", "Manage complexity", and "Think long term", all of which were seen by the researchers as skills that help to engage and motivate others (Filho et al., 2020, p. 12).

In their research on leadership competencies that can aid students in addressing wicked sustainability challenges, Hull et al. (2018) affirm the importance of collaborative learning outcomes, noting that wicked challenges require the complex and stressful task of collaborating with individuals who have diverse attitudes, cultures, disciplines, and professional obligations. Using the example of the Virginia Tech Center for Leadership in Global Sustainability program, Hull et al. (2018) offer several collaborative outcomes students are assessed on, which include the ability to understand teammate characteristics, develop trust among others, and work with external stakeholders. Students' capacity to engage within diverse groups of participants is highlighted in Burns' (2016) study, which revealed the need for learners in their program to lead by example, and to increase their ability to seek action through collective means. Additional collaborative skills and learning outcomes presented in the literature on these programs and courses include behaving productively within a team, meaningfully contributing to group discussions, and appropriately handling situations where individuals assert views that challenge one's own (Burns, 2016; Holdsworth & Sandri,

2014; Missimer et al., 2013). These skills and learning outcomes collectively signify the need for inclusivity over superiority in the sustainability leadership field.

### **Experiential Learning**

Given the emphasis on action over knowledge in sustainability education, it is unsurprising that many of the skills and outcomes identified in sustainability leadership courses are experiential in nature. Indeed, Savage et al. (2015) indicated that the SLC program at Dalhousie University utilized problem-based learning to grow students' ability to solve challenging, multidisciplinary sustainability issues. Experiential opportunities including student-led workshops and projects were offered to assist learners in achieving outcomes such as "Construct[ing] scenarios about how the problem might play out in the future" and "Creat[ing] intervention strategies to avoid undesirable scenarios and realize sustainability visions" (Savage et al., 2015, p. 693). Comparably, in a case study examining a course at the University of Hamburg, Wolff, and Ehrstrom (2020) noted that students in this course were required to explore local sustainability-related challenges during visits to seven of their city's districts. Drawing from these experiences, students then derived connections between local and global sustainability trends and identified solutions for urban transformation.

Stewart's (2010) list of learning outcomes for sustainability education, which was developed by the University of Maryland Climate Action Plan Work Group, offers several action-oriented steps students can take to enact positive change, including tracking their individual carbon footprints, engaging in work that leads to a more sustainable society, and incorporating informed sustainable decisions in their lives. Moreover, Stewart (2010) also suggests that students should be given hands-on experiential opportunities to make campus operations more sustainable so they can apply the skills they learn in "the real world" (p. 9). These assertions, in addition to those discussed above, provide evidence that effective sustainability leadership requires an education focused not only on outcomes that encourage action and experience, but on skills that can be transferred to tackle real-world issues in students' communities as well.

### **Transformative Learning**

Perhaps the most significant skills and learning outcomes students are expected to acquire in sustainability leadership education are those that promote some degree of self-transformation. In line with the pedagogies used to facilitate transformative learning, the skill of self-criticism as well as outcomes that demonstrated personal growth emerged as common themes in the literature. While conducting research on a sustainability course delivered at the University of Melbourne, Holdsworth and Sandri (2014) asserted that a major learning objective for students was reflecting on and questioning their personal beliefs and identity. The rationale for this particular objective appears to rest on the idea that course work should help students to gain an understanding of themselves, but also to gain the courage and skills necessary to make substantial changes. This idea is similarly reflected in Burns' (2016) study, which highlighted self-transformation as a significant theme throughout student reaction papers. More specifically, students articulated that the course helped them to discover their voice, grow their self-confidence, and reshape their ideas of how it felt to be a sustainability leader (Burns, 2016). According to Missimer et al. (2013), these outcomes and skills that target transformational learning are integral to sustainability education as they help to achieve the attitudinal change that is needed to make a large-scale difference in society.

Within their previously mentioned discussion of reflective learning, Ayers et al. (2020) draw attention to two prerequisite outcomes for sustainability leadership that relate to transformation, which are "developing personal awareness in one's relationship with sustainability challenges and being able to critically consider how to respond to complex challenges" (p. 2). These sentiments are shared by Bendell and Little (2015), whose research emphasizes the need for a more critical approach to sustainability leadership involving outcomes such as self-exploration and self-development. As they explain, the process of self-exploration can encourage learners to let go of former assumptions about themselves and their world, while the process of self-development can provide opportunities for personal transformation. Bendell and Little (2015) consequently suggest that educators should enable students to critically and openly examine their views of self and society, as traditional enterprise-oriented leadership training is not likely to spark shifts in consciousness.

In line with the pedagogies presented in the previous section, the skills and learning outcomes described here reiterate the need for collaborative, experiential, and transformative learning in sustainability leadership education. While each of the skills and learning outcomes assessed are individually important, combining chances to foster communication and collaboration competencies with real-world decision making and self-development will likely prove to be most effective in preparing students to become strong sustainability leaders.

### **Looking Forward: Alumni Perspectives on Sustainability Leadership**

In order to consider the longer-term effects of the pedagogical practices, skills and learning outcomes delineated in the previous sections, this review will now shift focus to examine literature on alumni experiences. Despite limited research on alumni perspectives of sustainability leadership, the existing literature reveals that collaborative, experiential, and transformational learning has influenced the lives of students following course or program completion.

#### **Sustainability Leadership Course and Program Strengths**

Existing research indicates that offering space for students to engage in the three types of learning identified throughout this review can positively impact alumni. While researching which aspects of a Leadership for Sustainability Education (LSE) graduate program at Portland State University had the greatest effect on the lives and professions of its alumni, Burns and Schneider (2019) discovered that students were personally impacted by the supportive sense of community as well as the chance to grow and transform their leadership abilities. The collaborative learning activities and safe learning environment fostered by the program allowed students to improve their communication, listening skills, conflict management, honesty, and patience. At the same time, the program's transformational focus encouraged student's self-growth and connection to place, which in turn raised their commitment to sustainability missions in society. On the professional front, experiential opportunities such as community-based learning were seen by alumni as highly influential to their future careers. Indeed, former students of the LSE program expressed that learning experiences within their communities helped them to network, build relationships, and earn job offers. Once hired, alumni could utilize practices gained from community organizations in their own professions (Burns & Schneider, 2019).

Further evidence of the positive impact sustainability leadership experiences can have on students' professional lives is reflected in Griswold's (2019) study, which sought to investigate the impact of undergraduate research experiences (UREs) on students' career choices and engagement with sustainability by surveying a group of URE participants four to nine years after its completion. The URE, which centred on sustainable energy and included field trips, group projects, reflective writing, and community-wide sustainability discussions, was found to have had a great influence on students' decisions to enroll in graduate studies or to pursue careers involving sustainability, and contributed to their success within these respective areas as well. The collaborative nature of the URE and the chance to develop relationships with other URE participants was seen by former students as an additional benefit, with many having maintained supportive connections with their sustainability-minded classmates years later.

Though not specifically related to leadership, Belkhir's (2015) pedagogical study on a sustainability management course at the W. Booth School of Engineering Practice emphasizes the benefits of experiential learning can have on graduates' ability to manage sustainability within professional environments. The course took place in a commercial entrepreneurial setting which exposed students to the complex and multidisciplinary nature of sustainability challenges in the workplace. Team-based projects represented a central course component, with students assessed on their ability to apply course content to cooperatively discover, explore, and present sustainable business solutions. Anonymized data from pre- and post-course questionnaires indicated that students felt a significantly higher commitment level to sustainability management and level of preparedness to manage sustainability following completion of the course. When asked to identify course strengths, students highlighted the opportunities to network with their peers and sustainability professionals in addition to witnessing real-life examples of sustainability in spaces outside the classroom, reaffirming the importance of collaboration and experience.

#### **Sustainability Leadership Course and Program Gaps**

In addition to the positive experiences of alumni, details regarding what sustainability leadership courses and programs may still be lacking and suggestions for how they could be improved are also noteworthy. A study by MacDonald and Shriberg (2016) involving alumni perceptions reemphasized the value of skill-based competencies over knowledge acquisition in sustainability leadership education, specifically in preparing students for practices in the workplace. The researchers explained that the same group of alumni demonstrated a further need for skills such as public speaking, negotiation, and coalition building in their professions. As a result of these findings, MacDonald and Shriberg (2016) suggest that, because sustainability leadership programs and courses are under immense pressure to serve several different needs and foster several different skillsets, increasing their duration or dividing them up into particular niches might prove beneficial.

Aiming to explore the extent to which graduates felt they would transition their leadership experiences to their workplaces, Thomas et al. (2020) similarly found that these graduates were not confident in their ability to adopt sustainability leadership roles in professional contexts. According to results from an assessment tool designed to examine their capacity to promote “leadership regarding the inclusion of sustainability principles in their employment”, graduates of a sustainability leadership focused construction program in Australia were more likely to take direction from program managers than assume the lead on sustainability initiatives themselves (Thomas et al., 2020, p. 1211). However, results also revealed that these graduates maintained firm connections to sustainability, leading researchers to suggest that they felt constrained within their workplace environments and would be able to advocate for sustainability actions when given the freedom to do so. In response, the researchers anticipate that revising program curricula to develop students’ confidence and provide them with the skills to overcome opposing powers in the workplace could help reconcile these issues.

The research explored here provides evidence that collaborative, experiential, and transformative learning can support sustainability leadership alumni in personal, professional, and academic endeavours. At the same time, it suggests that sustainability leadership programs and courses may lack opportunities for building skills such as public speaking, negotiation, and managing opposition. Future studies should continue to examine alumni experiences while investigating the relationship between these experiences and sustainability leadership course and program design.

## Conclusions

The themes in the literature examined throughout this review offer significant implications for sustainability leadership education. By highlighting how sustainability leadership students in previous studies have learned and benefitted from education that is grounded in collaboration, experience, and transformation, this review provides a guide for educators to navigate the important but complex task of fostering future leaders. Moreover, by identifying common characteristics of sustainability leadership courses and programs from the past decade within North America, Europe and Australia, this review positions sustainability leadership as unique from traditional forms of leadership and puts forth a set of conditions that should be addressed. Sustainability leadership’s focus on community, for example, indicates that it is a field that requires inclusivity over hierarchy, a revelation that is unsurprising considering that sustainability problems necessitate collective action over a single superior leader. At the same time, the learning of sustainability leadership is a deeply personal process that must give students the space to balance self-criticism with self-confidence. A final, vital implication is that passive, sender-receiver education models are insufficient for promoting sustainability leadership. It is not enough for students to gather and absorb content, they must intentionally experience and challenge sustainability-related issues in order for their learning to have any lasting or practical significance.

In summary, the past several years have seen higher education respond to the fight against critical sustainability issues by developing courses and programs that centre around empowering leaders and frequently include opportunities for collaborative, experiential, and transformative learning. Although research on these three types of learning shows promise, more scholarly attention is required to ensure that educators are employing appropriate pedagogical practices and cultivating skills and learning outcomes that can be transferred to students’ personal and professional lives. As previously noted, more research from the perspective of sustainability leadership alumni would also be beneficial. While sustainability leadership is still an emerging concept in need of further research, this review has shown the positive potential that post-secondary sustainability leadership programs have in shaping and supporting the types of leaders the world so desperately needs.

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