

# Leveraging sport as a venue and vehicle for transformative sustainability learning

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Received 22 February 2020  
Revised 18 May 2020  
8 June 2020  
Accepted 9 June 2020

## Abstract

**Purpose** – Given greater awareness of environmental issues and the acceleration of climate change, universities are increasingly requiring undergraduate students to complete coursework in environmental issues. Research has shown that environmental courses hosted in science departments can be too challenging for students with no science background. Thus, new approaches to general environmental education at the undergraduate level are necessary. This paper aims to advance three transformative sustainability learning (TSL) interventions that leverage sport as the living laboratory for environmental education through examining green teams and in depth sport venue tours.

**Design/methodology/approach** – This paper details the experimental application of three TSL interventions in undergraduate sport courses.

**Findings** – Each intervention produced lasting benefits for several parties. Students benefit from greater exposure to sport management organizations and a hands-on learning opportunity. Sport organizations benefit from a promotional opportunity to showcase their sustainability efforts, improved sustainability practices at their facilities and the opportunity to leverage the students' involvement for fan engagement initiatives

**Research limitations/implications** – The interventions presented in this paper were developed in a North American sport context, however, there is a considerable opportunity to develop similar interventions in any region where sport organizations exist.

**Originality/value** – Despite being one of the most universally appreciated and visible industries, the sport industry has yet to be used as a site for meaningful sustainability learning interventions. The interventions presented herein introduce the opportunity to leverage students' love of sport for outcomes for all parties: the students, the host organization and sport fans.

**Keywords** Sport, Undergraduate, Experiential learning, Transformative sustainability learning, Living laboratory

**Paper type** Case study



## 1. Introduction

In 2018, the Intergovernmental Panel on Climate Change released a report on the harrowing effects and potential future impacts of climate change (IPCC, 2018). Current impacts include, for example, increased days of extreme heat, linked with prolonged periods of drought and

more frequent wildfires, and more violent storm activity, especially in tropical regions (IPCC, 2018). These impacts have caused health issues such as heat-related illness (Gronlund *et al.*, 2018), exacerbated hunger (Woodward and Porter, 2016) and caused damage to important infrastructure (Kim *et al.*, 2017), impacting supply chains across all industries (Halldorsson and Kovacs, 2010). However, for many people living in developed countries, these impacts are less damaging, thus, easily ignored (Page, 2008). As a result, apathy and disinterest are prevalent attitudes toward the natural environment and the ongoing climate crisis (Antadze, 2018; Chang, 2015).

David Orr, renowned environmental activist, argued that the environmental crisis is fundamentally a crisis of education. If more people understood the natural environment, its current and expected future challenges, and their relationship to the environment, perhaps minds and behaviors would change. Research supports the proposition that sport can be used as a leverage point to engage and educate sport participants (Beery, 2013; Brymer *et al.*, 2009; Chang, 2015; Cunningham *et al.*, 2020; Trail and McCullough, 2018, 2020) and spectators (Casper *et al.*, 2020). These researchers have empirically shown that engagement in nature and educational campaigns increases the likelihood to engage in pro-environmental behaviors while engaging in sport and the transfer into their everyday lives. In fact, the United Nations Sports for Climate Action Framework (2018) seeks to use sport as a platform for environmental education among sport participants and spectators. This application has recently expanded to a formal education curriculum (Mercado and Grady, 2017).

Environmental education or some variation thereof (e.g. sustainability education) is now a common general education requirement in undergraduate programs (Shek *et al.*, 2015; Sterling, 2010). These courses are meant to engage students in discussions and learning about environmental responsibility, the human-nature relationship and anthropogenic climate change (Cullingford and Blewitt, 2013; Sterling, 2010). However, studies have shown that students perceive the content of science courses on environmental issues as “too advanced for students without sufficient baseline knowledge” (Shek *et al.*, 2015, p. 1024). As such, the onus is on educators in every discipline to develop curricula and use pedagogical strategies that engage students with vastly different interests and educational backgrounds in meaningful educational experiences about the environment and sustainability.

Concurrent to the proliferation of environmental education requirements in universities globally, North American universities operate in an institutional system with increasing social and political pressure to deliver educational experiences that promote multiple learning outcomes (Sterling, 2010). These outcomes include:

- enhanced critical thinking, writing and presentation skills (Halpern, 2013);
- preparedness for the workforce (Kinash *et al.*, 2015); and
- an understanding of local and global challenges that affect society now and in the future (Haigh, 2014).

However, seldom do courses address all three learning outcomes at once (Diamond, 2011). Instead, these learning outcomes are parsed out over several different courses and may seem disjointed. Fortunately, pedagogical research has shown that, when delivered intentionally and in congruence with in-class topics, extra-classroom experiences can achieve all three learning outcomes concurrently (Kilgo *et al.*, 2014).

In sport management, service learning and experiential learning models have been leveraged with positive results toward all three aforementioned learning outcomes (Bruening *et al.*, 2010; Martin *et al.*, 2016), though all three are not explicitly addressed at

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once. In addition to the increasingly complex expectations placed on university programs by the public (Sharma, 2015), sport management is an applied discipline with a moral imperative to serve and work closely with the sport industry (Chalip, 2006; Irwin and Ryan, 2013) and are specifically needed with regard to environmental sustainability (Sartore-Baldwin and McCullough, 2018). As such, the pedagogical challenge of delivering learning experiences that promote multiple learning outcomes is complicated by the stress to serve the industry. In this paper, we contend that all three learning outcomes can be met, and the sport industry can be serviced, through transformative sustainability learning (TSL) programs.

## 2. Theoretical framework

### 2.1 Transformative sustainability learning

Originally conceptualized in the early 2000s, TSL is an elevated form of experiential learning wherein hands-on experiences drive social or environmental change (Sipos *et al.*, 2008). Specifically, TSL engages students in immersive experiences that put sustainability ethics and purpose at the center of the work (Burns, 2015; Sipos *et al.*, 2008), leading to improved skills, heightened level of knowledge on climate change and global environmental challenges, greater employability and changed attitudes toward nature and the environment (Burns, 2015; Mintz and Tal, 2014; Palma and Pedrozo, 2016).

TSL is conceptualized as having three critical components: engagement (“head”), enactment (“hands”) and enablement [“heart;” Sipos *et al.* (2008)]. The learning experience must be designed to include all three components: students must participate in coursework (readings, lecture, discussion) that facilitates and encourages critical thinking about sustainability, then have an opportunity to enact these ideas (through a hands-on or kinetic experience of some sort). Following the kinetic experience, students should reflect and identify psychological connections or attitudinal changes that may have been triggered by the kinetic experience (Bergeå *et al.*, 2006; Sipos *et al.*, 2008). The combination of these three elements leaves students with a theoretical understanding of the social or environmental issue, a tangible experience and an opportunity to reflect on their learning experience (Burns, 2015) that influence affective and self-enlighten of students.

Shephard (2007) rightfully identified that university educators typically focus on “the cognitive domain of learning; what we know and understand and how we describe, comprehend, apply, analyze, synthesize and evaluate this knowledge and understanding” (p. 88), leaving the affective and emotional outcomes of learning under-examined. An extension of this trend is that experiential learning interventions in the management disciplines (including sport management) typically focus on head and hands components (Micklich, 2011). Thus, it is the affective (heart) component, described as “changes in interest, attitudes and values, and the development of appreciations and adequate adjustment” (Bloom *et al.*, 1964, p. 7), that really set TSL interventions apart and enhance their value.

In their taxonomy of educational objectives, Bloom *et al.* (1964) propose a hierarchy of affective outcomes. It begins at the most basic levels with a “willingness to listen, to read and to acquire information” (Shephard, 2007, p. 90) and progresses through intermediate levels that involve discussion and the formulation of personal views on the issue (in this case, environmental sustainability). At higher levels of the outcomes hierarchy, students begin making life choices and experiment with prioritizing sustainability in their personal lives (Shepherd, 2007). The pinnacle of the affective learning outcomes hierarchy is achieved when students become self-reliant, develop the capacity to cooperate or lead on the issue and develop the confidence to assess their decisions (Bloom *et al.*, 1964). While the measurement of students’ attainment and progression through the hierarchy is challenging, it is possible

to identify and assess affective outcomes using student reflections (Howe, 2003; Shephard, 2007).

By way of example, TSL initiatives have been used in engineering coursework (Lavrysh, 2018), sustainability leadership certificate programs (Savage *et al.*, 2015) and graduate-level management curricula (Palma and Pedrozo, 2016) wherein students had out-of-classroom, hands-on learning experiences with a private-sector sustainability project. In each case, the experience was followed by a guided reflection activity to track their personal growth and psychological connections to nature and the environment (Palma and Pedrozo, 2016). For instance, Savage *et al.* (2015) conducted a pre- and post-intervention questionnaire as a reflection exercise and to measure learning outcomes, and found that “personal development exercises enhanced [students’] ability to reach the program’s target sustainability leadership outcomes, specifically: attaining personal and emotional attributes that would help them behave sustainably” (p. 699). Key feature of TSL projects is the benefits for recipient or partner organizations or the local community in which the TSL initiative takes place. As such, the potential for TSL initiatives to be applied in different disciplines has been proven and the uniform positive outcomes for recipients, host organizations or host communities are evident.

As yet, few accounts of TSL initiatives offer overviews of the specific strategies or approaches that were used to deliver the initiative. Further, no previous research discusses the appropriateness or utility of TSL initiatives for students in disciplines outside the one central to the study, such as students taking an elective course in a discipline outside their major. However, TSL has yet to be formally introduced to the sport management discipline as a pedagogical framework or strategy.

### *2.2 Sport for social change*

Sport organizations, such as stadia, events, team franchises and clubs, enjoy significant media coverage and visibility which lends to their sizable following and consumer base worldwide, in addition to active participation (Smith and Steward, 2010; Trail and McCullough, 2020). Combined, these factors indicate widespread interest in sport.

Further and importantly, sport has a unique history of serving as a forum for social change (Coombs *et al.*, 2019; Kaufman and Wolff, 2010), particularly on issues that are highly politicized (Schmidt *et al.*, 2019). For example, consider the social significance of the Battle of the Sexes tennis game in 1973 between Bobby Riggs and Billie Jean King that challenged gender-based notions of athleticism and, by extension, sex roles in society (Smith, 2006; Ware, 2011). The recent Take a Knee protest in the NFL are another excellent example of sport figures elevating public discourse on an important social issue (Boyce, 2017; Marston, 2016; Schmidt *et al.*, 2019). In each case, sport was leveraged as a platform through which to engage the public in important conversations about social values, especially among individuals and groups who would have otherwise remained disinterested and unengaged (Schmidt *et al.*, 2019).

For the same reasons those conversations spread and contributed to the collective conscience, including widespread interest in sport (Schmidt *et al.*, 2019) and high degree of psychological involvement with sport teams (Kwon *et al.*, 2005), we propose sport can be used as a platform for engaging people in climate change and sustainability conversations, and indeed, has already been used to do so (Inoue and Kent, 2012; McCullough *et al.*, 2020). Specifically, we elucidate three strategies for TSL that occur in sport settings or with sport subjects, leveraging students’ interest in sport to educate them about sustainability.

### 3. Teaching interventions for transformative sustainability learning

In this paper, we advance three types of teaching interventions for TSL in sport management, based on our teaching experiences (Table 1). The three TSL strategies are venue tours, green teams and living laboratories. Each differ in terms of student and instructor involvement, the length and amount of work and the level of academic rigor in the desired learning outcomes. These interventions apply to varying levels of education including undergraduate and graduate coursework. TSL interventions can also be customized to a specific course and even integrated with blended assignments, leveraging course topics across the curricula.

#### 3.1 Venue tours

A venue tour is a guided visit to a sport venue, wherein participants gain a behind-the-scenes look at how the facility operates. At the request of the group leader or professor, the guide can focus especially on energy use, lighting, water, waste management and other sustainable features of the building and organization. These can be conducted as field trips or students can be sent to participate in a venue tour on their own. Of the three TSL strategies introduced here, guided venue tours are the most basic, least involved, and thus best for introductory-level coursework in sustainability.

In guided venue tours, students learn directly from a member of a sport organization about managing the sustainability of a large facility and learn about career prospects in this space. These visits integrate with coursework by helping students to witness resource management strategies and frameworks (such as zero-waste or circular economy) at work or the lack thereof. Students can then engage in discussions or a written assignment on what they learned and saw, and importantly, what they did not see and how the organization can improve, thereby adopting both a critical perspective (Sartore-Baldwin and McCullough, 2018) and one of appreciative inquiry (Mallen and Chard, 2011).

An example of a successful sustainability-oriented guided venue tour was a class trip to US Bank Stadium in February 2018, in the week following Super Bowl LII. Organized by the

Sport ecology TSL intervention	Characteristics	Student involvement	Beneficiaries
Venue tour	<ul style="list-style-type: none"> <li>• One-time (brief) interaction with sport property</li> <li>• Comprehension-based TSL</li> </ul>	Informational and passive	Student Sport property
Green team	<ul style="list-style-type: none"> <li>• On-site at the sport property</li> <li>• Multi-day interaction with sport property (i.e. training and volunteer days)</li> <li>• Application-based TSL</li> <li>• On-site at sport property, potentially with engagements in the community (i.e. at fan zones, local transit links)</li> </ul>	Interactive	Students Sport property Fans
Living lab	<ul style="list-style-type: none"> <li>• Multi-day interaction with sport property (i.e. ongoing liaison during the project, and final presentation)</li> <li>• Application-based TSL</li> <li>• On-site at property and in-class</li> </ul>	Interactive	Student Sport property

**Table 1.**  
Characteristics of TSL experiences in sport

instructor and led by the facility's Sustainability Coordinator, students were shown the facility while the post-sort of event waste was happening. Consequently, students were shown all the usual stops on the tour (i.e. the seats, the media suite, the locker room), but in addition, students were introduced to behind-the-scenes aspects of recycling and compost management. The Sustainability Coordinator showed the students three-way waste receptacles on the concourse (i.e. trash, recycling, compost), the back-of-house staircases and elevators that are used to move waste to lower parts of the building and the sorting system in place. Then, a meet-and-greet was facilitated with the facility's chefs who showed students how sustainable food systems are incorporated into the venue's kitchens. This included a review of their supplier list (i.e. local farms, restaurant grocers), and their in-kitchen waste management systems. Over the two-hour visit, which is the duration of a normal class period, students met with several sustainability agents in the facility (i.e. the Sustainability Coordinator, two chefs, and several facility staff involved with sorting waste) and witnessed multiple aspects of sustainable business operations: sustainable food supply, waste management and design (i.e. facility architecture).

While formal sustainability-oriented stadium tours are advantageous because they provide an understanding of how processes and features are incorporated into event production and management, students may miss out on the evaluation of these efforts in practice. Another example of a facility tour can be more indirectly related to the event experience of fans, commonly referred to as a "secret shopper" visit. In an alternate assignment, students were provided tickets to a local sporting event and were asked to record their activities and reflect upon their experiences related to environmental sustainability from leaving their residence to attending the event until arriving back at their residence after the event. Students were to record their various experiences from available modes of transportation to the venue, availability of various waste receptacles, any environmental messages or education at the facility and any other environmental sustainability-related aspects from their gameday experience. After the event, students were instructed to reflect upon their experience to see what the organization/venue/event did well concerning environmental sustainability efforts, areas of immediate improvement and possible integration of future initiatives and aspects as they related to other course content (e.g. fan engagement campaigns, marketing efforts, sponsorship opportunities, traffic control, etc.). Finally, students shared in class their experiences and the class was intentionally prompted with questions that the students may not have considered or mentioned in their personal reflections. More than one student commented on the venue tour being their first exposure to sustainability operations and that the tour inspired them to look at sustainability issues more closely. These reflections indicate affective learning outcomes: a willingness to listen and learn about sustainability, where there was previously no interest or willingness in doing so.

During venue tours, students benefit from exposure to sustainability principles at work or lack thereof. The facility or organization benefits from the opportunity to share their sustainability efforts with the public, which is important from a marketing and visibility perspective as most green sponsorships and collaborative efforts rely on a certain amount of media coverage and promotion to be sustained (Laing and Frost, 2010). Students are encouraged to think differently about the facility and its operations (Lavrysh, 2018), which has been shown to translate to greater interest in sustainability-related careers.

Guided venue tours and secret shopper visits are TSL experiences because there are multiple opportunities to engage the head, enact the hands and enable the heart. Engagement begins in the classroom with the coursework but comes to fruition during the guided venue tour and secret shopper visits when students can see the practical application



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of the concepts learned in the classroom. In the first case, students can meet and connect with various facility members of the venue and engage in meaningful discussion about the sustainability in the venue. Enactment occurs when students have an opportunity for experiential learning or the chance to use their hands during the tour. Experiential learning is just one component of the enactment of the hands (Sipos *et al.*, 2008). An example would be students visiting the gardens and green spaces of a venue with a chef or venue staff, where fresh vegetables and herbs are being grown for use in the kitchens. Students can learn and experience what is needed to maintain the garden, the benefits of on-site urban gardens, and perhaps have a chance to pick, smell and taste some of the vegetation grown on-site. Finally, enablement of the heart may come from the pride the student feels as a fan or the empowerment and emotion from the knowledge gleaned from the venue tour or viewing their team in action in the case of a secret shopper visit.

### 3.2 Green teams

A second, more involved TSL intervention option for instructors to convey environmental and sustainability knowledge to students is to form or join, a green team for a sporting event. A green team refers to a dedicated group of employees or volunteers within an organization which plans and facilitates the implementation of sustainable operations principles in their work (McCullough *et al.*, 2018). In the context of sport organizations, green teams are typically groups of volunteers who attend sport events to promote sustainable behaviors among fans. For example, they may be “garbage goalies” and encourage fans to compost their food and recycle their cups (e.g. Ralphie’s Green Stampede at CU Boulder) or ambassadors for a sustainable sponsor such as a public transit provider or waste management service (e.g. Caught Green Handed campaign at NCAA Women’s Final Four). In many cases, particularly on university campuses, green teams consist of undergraduate students with an interest in both sustainability and sport. These opportunities are excellent for students registered in various sustainability courses and are not exclusive to sport-related coursework (Martin *et al.*, 2015).

Participating in a green team as part of a university course is a transformative experience as it asks the participant to place the environment and ethic of sustainability at the forefront of their sport experience and to relay these values to fans. This exchange of information is a critical learning opportunity for the student as they encounter folks who are sustainable themselves and subscribe to sustainable lifestyles or they may be interacting with a person who does not believe in climate change at all. In either case, the green team volunteer is asked to convey the message that the organization cares about the environment. Further and importantly, green teams provide participants with unique exposure to event and facility operations (such as waste management and sponsorship activation) that lends to networking opportunities with sport organization staff and tangible experience which contributes to employability in the sport sector (Martin *et al.*, 2015; Slep and Reed, 2006). Finally, when integrated with coursework, the green team experience begins and ends with guided reflections in the form of journal entries, which foster targeted reflection among students and lend to an evaluation of their experience.

While it can be difficult to measure the affective outcomes of teaching interventions, as “internal or covert feelings and emotions are as significant for this domain as are the overt behavioral manifestations” (Bloom *et al.*, 1964, p. 7), we have extracted the following quotations from student surveys following a green team intervention in Spring 2018 and Spring 2019:

The experience really opened up my eyes when it came to how I was treating the environment in my day-to-day life back home, and changed my outlook completely. I see more now. It’s hard to

look at an event or any sport operation really and not see the sustainability aspects. It's a huge part of sport management that just gets ignored, but now I see it and I feel like I can't look away. (3rd year sport administration major, Spring 2019)

It was an eye-opener to see how little changes in our habits can create great positive impacts not only on the environment but also by inspiring others and making those personal connections. Being a green team member allowed me to meet people who share my values and increased my overall awareness of my own responsibility to do better in an environmental sense. No classroom experiences have ever done that for me. (4th year sport management major, Spring 2018)

These quotations demonstrate the potential for green team experiences to move students beyond the initial levels of affective learning outcomes (willingness to acquire information, listen and read) and into the intermediate and advanced levels where they are formulating opinions on sustainability and prioritizing sustainability in their own lives and careers (Shephard, 2007).

While research about green teams is still ongoing and empirical data supporting the outcomes of green team participation are limited, early results of qualitative studies suggest students participate mainly because of the draw of attending a sport event and leave feeling like they have helped do something important (Gopher Athletics, 2017). This feeling of accomplishment translates to further volunteering in the sport or sustainability domains and a deeper interest in- and awareness of- sustainability in the context of sport facilities and sport fandom (CU Boulder Sustainability Office, 2017).

Sport organizations that host green teams benefit from a volunteer workforce that contributes meaningfully to event operations and fan education efforts. Green teams are low-cost initiatives for sport organizations to engage with potentially high benefits. Further, the planet benefits from the additional care taken to promote sustainability and sustainable behaviors both within the sport facility and in fans' everyday lives upon leaving the facility, for example, through increases in recycling intentions among fans.

Participating as a green team volunteer is a TSL experience because of the various occasions for engagement, enactment and enablement. First, the student must learn about the facility and the different tasks they will be performing at the event, often through pre-event coursework or volunteer training sessions. When a student engages in the task of serving on a green team, they see first-hand how the sustainable initiative works at a live event. As a volunteer, the student has an opportunity to engage in discussions with a multitude of other fans at the event. The hands-on or experiential learning aspect of a green team volunteer is enacted through the distribution of recycling bags at tailgates, helping other fans sort their waste into the proper receptacles or the distribution of coupons or educational materials at the gates. Enablement of the heart comes from the sense of accomplishment and pride felt by the student for the opportunity to be part of a team that helped other fans learn about sustainability and together create a more sustainable event. Positive feedback, especially from the sport organization's staff or a volunteer coordinator, is particularly useful for strengthening positive psychological attachment to the event, the organization and the sustainability initiative. In addition, the knowledge that is attained by the student and the fans as a result of interactions, may have a profound effect on both parties and result in greater participation in sustainable efforts outside of the event (Inoue and Kent, 2012).

### *3.3 Living labs*

A more advanced and involved TSL opportunity, best for seniors and graduate students, is a sustainability "living lab" within a sport setting.



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A living lab is an exploratory, experimental consulting-style project wherein students are presented a challenge (i.e. an upcoming LEED certification process or a desire to reduce waste) and a context (in this case, a sport organization) and asked to propose sustainability solutions to address the challenge. Living labs facilitate sustainability learning through engaging in a hands-on project over a longer period of time than other interventions, such as a full semester or full academic year. It is important that with living labs, there are clear project outcomes, and preferably, a commitment from the organization to engage with the students at the end of the project to hear their ideas and show interest in their work (and ideally, to consider implementing the solutions.)

Living labs integrate with senior-level coursework or graduate courses. For instance, these projects make an excellent capstone project (see example below). Alternately, students can use sustainability apprenticeships or internships as a form of individual “living lab” opportunity. The living labs are TSL experiences that offer students a consistent opportunity to engage in the application of theory, with feedback from peers and professionals, typically in a project format.

Living labs can be facilitated in groups or as an individual project. An example of a group-based living lab project took place in a “Grand Challenges” sport management course at the University of Minnesota. In this project, students were taught about circular economy frameworks (Geissdoerfer *et al.*, 2017) and then instructed to ideate and propose ways for the Target Center, a large basketball arena downtown, to adopt sustainability practices of their Leadership in Energy and Environmental Design (LEED) application that was coming up in a year. Specifically, the group spent three in-class sessions in lectures about circular economy frameworks and sport sustainability, then participated in a sustainability-oriented venue tour of Target Center.

While on the tour, the group met the lead Facility Manager responsible for overseeing the LEED certification process. The Facility Manager indicated to the group that their support was needed to identify opportunities to secure LEED certification, particularly in the areas of sustainable food, maintenance (especially, cleaning) and waste management. Then, the students had two months to prepare a report with recommendations on possible approaches to collecting points in the LEED certification system. Proposals varied but to offer insight into the depth of the research conducted, the group working on sustainable food began by researching sustainable food production and farm-to-table sourcing networks in Minnesota. Based on a review of other facilities’ best-practices for sustainable food (conducted through phone interviews with staff at other, similar facilities), interviews with the Head Chef at Target Center and a review of the current menus and lists of suppliers, the students advanced a sophisticated proposal to increase fresh food options, especially vegan and vegetarian options and to change some of the suppliers to be more local.

Further, they proposed turning the existing green roof at the Target Center into a garden in the summer months to grow food that would be served in the concession stands during Minnesota Lynx Games, so that some food was produced sustainably on-site. For this, the students learned what types of crops would re-grow year over year given the harsh winter conditions and met with the Facility Manager separately to visit the green roof, bringing along friends from the agriculture science program to assess its potential for food crops. As a supplement, the students also researched local charities and homeless shelters that may be willing and able to take unsold prepared food at the end of each game. This semester-long project included two site-visits (one with the whole class, another with just the group), two meetings (and many emails) with the Head Chef, a meeting with the center’s Operations Manager to learn what was doable in terms of watering the plants and to coordinate the planting effort and several research phone calls to other facilities, local farms, sustainable

food experts and suppliers. By the end of the term, during class discussions dedicated to reflections on the living lab project, students indicated they learned far more about sustainability than they had initially anticipated for a sport class and appreciated the complexity of LEED accreditation systems and facility management. For instance, one student wrote: "I feel like our group really made a difference for the Target Center. By working with [Head Chef] and [Operations Manager] I got a lot more confident in my own ideas." (4th year sport management major). Based on the class discussions and this quote, there is evidence that this student attained the higher levels of affective learning outcomes, in addition to refining their cognitive skills in relation to sustainability management.

An alternate approach to facilitating group-based living labs is to offer students solo projects. An individual project can enhance a student's TSL educational experience through the student's personal involvement engaging with the various individuals involved in the project. An example of an effective solo graduate living lab experience emerged from the Sport Sustainability Leadership certificate program at Seattle University. A student chose to work with the sustainability department of a small DI university to evaluate, create and integrate environmental sustainability into a college athletic department. Specifically, the student was tasked with designing a prospectus for sustainability initiatives in the athletics department. For the length of the project, the student fostered working relationships with the university's Chief Sustainability Officer, the Recycling Coordinator, and Athletic Director, in addition to the head of the Facility Management department. This newly-formed team, coordinated by the student, initially collaborated to benchmark sustainability efforts within the athletics department and evaluate the effectiveness of these respective initiatives. Next, the student looked for new sustainability opportunities within the athletics department and researched the feasibility of implementing the newly created initiatives. Finally, the student, with the help of the assembled team of internal stakeholders, began to plan a timeline to drive implementation of the new initiatives. At the end of this project, the student reflected upon the experiences to use this heightened reflexive practice to enhance the professional preparation of the student and improve the educational learning aspect of the project. The student noted that the trust built through personal relationships during the project allowed for deeper conversations and emotional connection with the stakeholders involved in the project. In addition, the student noted a willingness to ask more questions that may not have otherwise asked in other classrooms.

The student reflected that the true benefits of TSL were not ascertained during the process but rather during the reflection period that was required prior to the construction of the capstone project. The reflection process revealed the wealth of knowledge gained and shared between the student, the Sustainability and the Athletic Department. The collaborative effort and fresh perspective and ideas were welcomed by the various stakeholders associated with the athletic department, which shaped new relationships and a platform for positive sustainable change. The student reported a profound sense of accomplishment, personal growth and renewed exuberance for learning as a result of the TSL opportunity. Moreover, a lasting impact of the student's efforts resulted in jointly funded internships for two students to continue her initial work between the campus sustainability and athletic departments continuing this living lab opportunity in the future.

Living labs are TSL experiences as students gain a deeper understanding of the various interrelated aspects of environmental sustainability and the business and production of sport events, as well as facility management. In effect, students can operate as sustainability consultants identifying prospective issues, collecting and analyzing pertinent data and synthesizing relevant information to make informed solutions for increased environmental performance. These opportunities obviously give students a tremendous hands-on and

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applied learning experience that affords them opportunities that go well beyond applying course concepts to engaging with industry professionals and demonstrating their professional preparation and abilities.

#### 4. Discussion

Leveraging students' interest in sport can be a useful inroad to TSL, with many beneficiaries. The students benefit from an exciting, hands-on learning experience. The organization benefits from an opportunity to promote their sustainability efforts and engage in discussions about how they can improve. Then the sustainability movement benefits from increased awareness and interest, both among student participants and fans who may engage with them.

One possible limitation or barrier, to implementation of these TSL interventions, is the centrality of relationships with sport organizations. Venue tours, green teams and living labs are sometimes (though not always) designed in tandem with the host sport organization, and thus require relationships be initiated and fostered. Its not within the scope of this presentation to discuss all the strategies for relationship-building, but there is considerable literature on developing inter-organizational relationships in sport (Babiak, 2009; Misener and Doherty, 2012) and developing out-of-class experiences with external parties (Pate and Shonk, 2015; Pagararo *et al.*, 2008). Future research might examine best-practices for building relationships between sport management instructors and local sport organizations for the express purpose of facilitating TSL interventions. This research might render clearer the pathways to establishing TSL interventions for instructors with limited existing networks.

A second possible limitation of these interventions is that each was developed in the North American context, where sport is a well-funded and highly visible industry, with large sport facilities in nearly every town and city. We argue these interventions, particularly guided venue tours and living labs, could feasibly be conducted in any sport facility, from small community soccer pitches and local swimming pools, to large sport stadia such as Camp Nou (Barcelona) or Wembley (London). To facilitate such interventions outside North America, teachers may contact regional trade associations with broad membership that focus on sport ecology, such as the Sport Environment Alliance (Australia), the British Association for Sustainability in Sport (UK) and the Green Sports Alliance of Japan. These trade associations may be able to direct course instructors to nearby sport organizations that have adopted- or are interested in adopting- sustainable practices. Additionally, new academic organizations such as The Sport Ecology Group and the Association for the Advancement of Sustainability in Higher Education have wide networks of partners with whom these projects have been developed in past and may serve as useful resources for connecting course instructors to local sport firms with sustainability offices. In the first instance, however, inroads and relationships can be built with campus athletics departments. Further, some TSL options can be created without direct approval or involvement of the sport organization, such as secret shopper visits, to trial a TSL intervention before committing to a project requiring more involvement.

These strategies relate nicely to sport coursework and other coursework (e.g. we have seen architecture, engineering, public relations, human resources, communication and sustainability science students become involved in these TSL experiences). Sport management courses offer a wide range of applicable skills (event management, waste management, resource management, marketing) that are unique to the sector. These topics are deemed more accessible to students given the non-threatening nature of the course topics. As a result, students can more readily and openly engage with the course material

because it is perceived to be more accessible than a pure or hard science course. That is, core concepts from pure sciences can be applied in the sport context. Students are given the ability to see and experience these direct applications in a context that is personally relevant and accessible. In this sense, sport management TSL interventions are uniquely suited to delivering sustainability learning for non-science majors, addressing the limitation of science- or engineering-based sustainability coursework that can be too challenging without sufficient background knowledge (Shek *et al.*, 2015). As prior researchers have demonstrated, there is an increased need for current and future sport managers to be more aware and educated concerning the way their organization addresses environmental sustainability issues (Orr and Inoue, 2019; Sartore-Baldwin and McCullough, 2018) leveraging sport to promote environmental sustainability behaviors to fans and spectators (Trail and McCullough, 2020; Casper *et al.*, 2020). Doing so can ensure that a highly influential and high touch industry can encourage new populations to engage in environmentally responsible behaviors.

## 5. Conclusion

This paper explored three TSL interventions suitable for inclusion in sport management curriculum. While empirical data supporting the long-term outcomes of these interventions is yet unavailable, early anecdotal evidence from several iterations of each intervention, implemented across universities and departments, shows TSL interventions benefit several parties: students, sport fans and sport organizations. Moreover, each TSL intervention presented carries the strong potential for meeting multiple student learning outcomes, including improved critical thinking, workforce readiness, and enhanced understanding of local and global challenges, such as climate change.

As noted throughout the IPCC (2018) report, climate change is dramatically changing the way that human ecology functions and threatens the security of individuals and their specific wellbeing. These challenges are exasperated as a result of climate change and especially relevant in third world countries and have recently impacted developed countries like with the 2019–2020 Australian brush fires. While sport has a smaller environmental footprint than other industries, sport's impact is well noted to influence broad and diverse populations across the globe to act more sustainably. To this end, the United Nation's Sport for Climate Action (2018) framework seeks to leverage the power of sport to promote more sustainable behaviors. However, as Sartore-Baldwin and McCullough (2018) more ecological leadership is needed in the sport sector to achieve these ends. Thus, TSL interventions are an innovative ways to engage current and future sport managers to raise awareness of ecological issues and the necessary action and organizational leadership that is needed to create positive change in the sport industry and beyond.

## References

- Antadze, N. (2018), "The politics of apathy: trumping the ethical imperative of climate change", *Ethics, Policy and Environment*, Vol. 21 No. 1, pp. 45-47.
- Babiak, K.M. (2009), "Criteria of effectiveness in multiple cross-sectoral interorganizational relationships", *Evaluation and Program Planning*, Vol. 32 No. 1, pp. 1-12.
- Beery, T.H. (2013), "Nordic in nature: friluftsliv and environmental connectedness", *Environmental Education Research*, Vol. 19 No. 1, pp. 94-117.
- Bergeå, O., Karlsson, R., Hedlund-Åström, A., Jacobsson, P. and Luttrup, C. (2006), "Education for sustainability as a transformative learning process: a pedagogical experiment in EcoDesign doctoral education", *Journal of Cleaner Production*, Vol. 14 Nos 15/16, pp. 1431-1442.

- Bloom, B.S., Masia, B.B. and Krathwohl, D.R. (1964), *Taxonomy of Educational Objectives (Two Volumes: the Affective Domain and the Cognitive Domain)*, David McKay and Co, New York, NY.
- Boyce, T. (2017), "Putting learning into practice: integrating social media, crowd learning, and #ColinKaepernick in an introductory African American history class", *Radical Teacher*, Vol. 109, pp. 21-28.
- Bruening, J.E., Madson, R.M., Evanovich, J.M. and Fuller, R.D. (2010), "Discovery, integration, application and teaching: service learning through sport and physical activity", *Sport Management Education Journal*, Vol. 4 No. 1, pp. 31-48.
- Brymer, E., Downey, G. and Gray, T. (2009), "Extreme sports as a precursor to environmental sustainability", *Journal of Sport and Tourism*, Vol. 14 Nos 2/3, pp. 193-204.
- Burns, H.L. (2015), "Transformative sustainability pedagogy: learning from ecological systems and indigenous wisdom", *Journal of Transformative Education*, Vol. 13 No. 3, pp. 259-276.
- Casper, J., McCullough, B.P. and Pfahl, M.E. (2020), "Examining environmental fan engagement initiatives through values and norms with intercollegiate sport fans", *Sport Management Review*, Vol. 23 No. 2, pp. 348-360, doi: [10.1016/j.smr.2019.03.005](https://doi.org/10.1016/j.smr.2019.03.005).
- Chalip, L. (2006), "Toward a distinctive sport discipline", *Journal of Sport Management*, Vol. 20 No. 1, pp. 1-21.
- Chang, C.H. (2015), "Teaching climate change: a fad or a necessity?", *International Research in Geographical and Environmental Education*, Vol. 24 No. 3, pp. 181-183.
- Coombs, D.S., Lambert, C.A., Cassilo, D. and Humphries, Z. (2019), "Flag on the play: Colin Kaepernick and the protest paradigm", *Howard Journal of Communications*, pp. 1-20.
- CU Boulder Sustainability Office (2017), CU Environmental Center: Strategic Plan, Internal Report (University of Colorado at Boulder), available at: [https://docs.google.com/document/d/1ikwA8yQuP-j\\_yoQbdjOhEwIIa4PzFHU0D7UuWplUfpA/edit](https://docs.google.com/document/d/1ikwA8yQuP-j_yoQbdjOhEwIIa4PzFHU0D7UuWplUfpA/edit) (accessed 1 October 20).
- Cullingford, C. and Blewitt, J. (2013), *The Sustainability Curriculum: The Challenge for Higher Education*, Routledge.
- Cunningham, G., Blewitt, B.P. (2020), "Physical activity and climate change attitudes", *Climatic Change*, Vol. 159 No. 1, pp. 1-14, doi: [10.1007/s10584-019-02635-y](https://doi.org/10.1007/s10584-019-02635-y).
- Diamond, R.M. (2011), *Designing and Assessing Courses and Curricula: A Practical Guide*, John Wiley and Sons, San Francisco.
- Geissdoerfer, N., Savaget, P., Bocken, N.M.P. and Hultink, E.J. (2017), "The circular economy – a new sustainability paradigm?", *Journal of Cleaner Production*, Vol. 143 No. 1, pp. 757-768.
- Gopher Athletics (2017), Sustainability Prospectus, Internal Report (University of Minnesota). Unpublished.
- Gronlund, C.J., Sullivan, K.P., Kefelegn, Y., Cameron, L. and O'Neill, M.S. (2017), "Climate change and temperature extremes: a review of heat and cold-related morbidity and mortality concerns of municipalities", *Maturitas*, Vol. 114, pp. 54-59.
- Haigh, M. (2014), "Gaia: 'thinking like a planet' as transformative learning", *Journal of Geography in Higher Education*, Vol. 38 No. 1, pp. 49-68.
- Halldorsson, A. and Kovacs, G. (2010), "The sustainable agenda and energy efficiency: logistics solutions and supply chains in times of climate change", *International Journal of Physical Distribution and Logistics Management*, Vol. 40 Nos 1/2, pp. 5-13.
- Halpern, D.F. (2013), *Thought and Knowledge: An Introduction to Critical Thinking*, Psychology Press, New York, NY.
- Howe, A. (2003), "Twelve tips for developing professional attitudes in training", *Medical Teacher*, Vol. 25 No. 5, pp. 485-487.
- Inoue, Y. and Kent, A. (2012), "Investigating the role of corporate credibility in corporate social marketing: a case study of environmental initiatives by professional sport organizations", *Sport Management Review*, Vol. 15 No. 3, pp. 330-344.

- IPCC (2018), "Summary for policymakers", in Masson-Delmotte, V., Masson-Delmotte, V., Zhai, P., Pörtner, H.H., Roberts, D., Skea, J., Shukla, P.R., Pirani, A., Péan, C., Pidcock, R., Connors, S., Matthews, J.B.R., Chen, Y., Zhou, X., Gomis, M.I., Lonnoy, E., Maycock, T., Tignor, M. and Waterfield, T. (Eds), *Global warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty*, World Meteorological Organization, Geneva, in press
- Irwin, R.L. and Ryan, T.D. (2013), "Get real: using engagement with practice to advance theory transfer and production", *Sport Management Review*, Vol. 16 No. 1, pp. 12-16.
- Kaufman, P. and Wolff, E.A. (2010), "Playing and protesting: sport as a vehicle for social change", *Journal of Sport and Social Issues*, Vol. 34 No. 2, pp. 154-175.
- Kilgo, C.A., Ezell Sheets, J.K. and Pascarella, E.T. (2014), "The link between high-impact practices and student learning: some longitudinal evidence", *Higher Education*, Vol. 69 No. 4, pp. 509-525.
- Kim, K., Ha, S. and Kim, H. (2017), "Using real options for urban infrastructure adaptation under climate change", *Journal of Cleaner Production*, Vol. 143 No. 1, pp. 40-50.
- Kinash, S., Crane, L., Judd, M. and Knight, C. (2015), "Discrepant stakeholder perspectives on graduate employability strategies", *Higher Education Research and Development*, Vol. 35 No. 5, pp. 951-967.
- Kwon, H.H., Trail, G.T. and Anderson, D.S. (2005), "Are multiple points of attachment necessary to predict cognitive, affective, conative, or behavioral loyalty?", *Sport Management Review*, Vol. 8 No. 3, pp. 255-270.
- Laing, J. and Frost, W. (2010), "How green was my festival: exploring challenges and opportunities associated with staging green events", *International Journal of Hospitality Management*, Vol. 29 No. 2, pp. 261-267.
- Lavrysh, Y. (2018), "Implementation of transformative sustainability learning into engineering curricular", *Future Human Image*, Vol. 9, pp. 63-73.
- McCullough, B.P., Kellison, T.B. and Wendling, E. (2018), "Formation and function of a collegiate athletics sustainability committee", *Journal of Amateur Sport*, Vol. 4 No. 1, pp. 52-81, doi: [10.17161/jas.v4i1.6661](https://doi.org/10.17161/jas.v4i1.6661).
- McCullough, B.P., Orr, M. and Kellison, T.B. (2020), "Sport ecology: conceptualizing an emerging subdiscipline in sport management", *Journal of Sport Management*, doi: [10.1123/jsm.2019-0294](https://doi.org/10.1123/jsm.2019-0294).
- Mallen, C. and Chard, C. (2011), "A framework for debating the future of environmental sustainability in the sport academy", *Sport Management Review*, Vol. 14 No. 4, pp. 424-433.
- Marston, S. (2016), "The revival of athlete activism(s): divergent black politics in the 2016 presidential election engagements of LeBron James and Colin Kaepernick", *FairPlay, Revista De Filosofia, Ética y Derecho Del Deporte*, Vol. 10, pp. 45-68.
- Martin, N.T., Ross, S.R. and Irwin, R.L. (2015), "Utilizing community-based social marketing in a recycling intervention with tailgaters", *Journal of Intercollegiate Sport*, Vol. 8 No. 1, pp. 57-81.
- Martin, T., Warner, S. and Das, B. (2016), "Senior games: service-learning with older adults in a sport setting", *Sport Management Education Journal*, Vol. 10 No. 1, pp. 43-53.
- Mercado, H.U. and Grady, J. (2017), "Teaching environmental sustainability across the sport management curriculum", *Sport Management Education Journal*, Vol. 11 No. 2, pp. 120-127.
- Micklich, D.L. (2011), "Examining the cognitive, affective, and psychomotor dimensions in management skill development through experiential learning: developing a framework", *Developments in Business Simulation and Experiential Learning*, Vol. 38, pp. 261-272.
- Mintz, K. and Tal, T. (2014), "Sustainability in higher education courses: multiple learning outcomes", *Studies in Educational Evaluation*, Vol. 41, pp. 113-123.



- 
- Misener, K.E. and Doherty, A. (2012), "Connecting the community through sport club partnerships", *International Journal of Sport Policy and Politics*, Vol. 4 No. 2, pp. 243-255.
- Orr, M. and Inoue, I. (2019), "Sport versus climate: introducing the climate vulnerability of sport organizations framework", *Sport Management Review*, Vol. 22 No. 4, pp. 452-463.
- Page, E.A. (2008), "Distributing the burdens of climate change", *Environmental Politics*, Vol. 17 No. 4, pp. 556-575.
- Palma, L.C. and Pedrozo, E.A. (2016), "Transformative learning to promote sustainability: inserting the third level of learning in management programs", *Brazilian Journal of Science and Technology*, Vol. 3 No. 1, pp. 1-17.
- Pate, J.R. and Shonk, D.J. (2015), "An experiential learning trip: exploring student experiences and motivations for volunteering at the super bowl", *Sport Management Education Journal*, Vol. 9 No. 1, pp. 11-24.
- Pegararo, A., Séguin, B., O'Reilly, N. and Harrington, S. (2008), "Innovative pedagogy in sport marketing: the annual SPAD field trip", *International Journal of Sport Management and Marketing*, Vol. 4 Nos 2/3, pp. 255-276.
- Sartore-Baldwin, M.L. and McCullough, B. (2018), "Equity-based sustainability and ecocentric management: creating more ecologically just sport organization practices", *Sport Management Review*, Vol. 21 No. 4, pp. 391-402.
- Savage, E., Tapics, T., Everts, J., Wilson, J. and Tirone, S. (2015), "Experiential learning for sustainability leadership in higher education", *International Journal of Sustainability in Higher Education*, Vol. 16 No. 5, pp. 692-705.
- Schmidt, S.H., Frederick, E.L., Pegoraro, A. and Spencer, T.C. (2019), "An analysis of Colin Kaepernick, Megan Rapinoe, and the national anthem protests", *Communication and Sport*, Vol. 7 No. 5, pp. 653-677.
- Sharma, R.S. (2015), "Role of universities in development of civil society and social transformation", *Proceedings of International Academic Conferences 2604181*, *International Institute of Social and Economic Sciences*.
- Shek, D.T.L., Yu, L., Wu, F.K.Y. and Chai, W. (2015), "General university requirements at the Hong Kong polytechnic university: findings based on multiple evaluation strategies", *International Journal on Disability and Human Development*, Vol. 14 No. 4, pp. 377-384.
- Shephard, K. (2007), "Higher education for sustainability: seeking affective learning outcomes", *International Journal of Sustainability in Higher Education*, Vol. 9 No. 1, pp. 87-98.
- Sipos, Y., Battisti, B. and Grimm, K. (2008), "Achieving transformative sustainability learning: engaging head, hands and heart", *International Journal of Sustainability in Higher Education*, Vol. 9 No. 1, pp. 68-86.
- Sleap, M. and Reed, H. (2006), "Views of sport science graduates regarding work skills developed at university", *Teaching in Higher Education*, Vol. 11 No. 1, pp. 47-61.
- Smith, M.M. (2006), "Billie Jean King: portrait of a pioneer", *Journal of Sport History*, Vol. 33 No. 1, pp. 113-117.
- Smith, A.C.T. and Steward, B. (2010), "The special features of sport: a critical revisit", *Sport Management Review*, Vol. 13 No. 1, pp. 1-13.
- Sterling, S. (Ed) (2010), *Sustainability Education: Perspectives and Practice across Higher Education*, Taylor & Francis.
- Trail, G.T. and McCullough, B.P. (2018), "Differential effects of internal and external constraints on sustainability intentions: a hierarchical regression analysis by market segment of running event participants", *Journal of Management for Global Sustainability*, Vol. 6 No. 2, pp. 1-36, doi: [10.13185/JM2018.06206](https://doi.org/10.13185/JM2018.06206).

Trail, G.T. and McCullough, B.P. (2020), "Marketing sustainability through sport: testing the sport participant sustainability behavior model", *European Sport Management Quarterly*, Vol. 20 No. 2, pp. 109-129, doi: [10.1080/16184742.2019.1580301](https://doi.org/10.1080/16184742.2019.1580301).

Ware, S. (2011), *Game, Set, Match: Billie Jean King and the Revolution in Women's Sports*, The University of NC Press, Chapel Hill.

Woodward, A. and Porter, J.R. (2016), "Food, hunger, health, and climate change", *The Lancet*, Vol. 387 No. 10031, pp. 1187-1886.

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