Students leading students: a qualitative study exploring a student-led model for engagement with the sustainable development goals

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Abstract

Purpose – Higher education institutions (HEI) play a critical role in developing student leaders equipped with the skills and knowledge needed to mobilize societal changes that the United Nations Sustainable Development Goals (SDGs) call for. To broaden this understanding, this study aimed to engage with student leaders of a grassroots, student-led initiative at the University of Calgary, the Sustainable Development Goals Alliance (SDGA), to better understand the experience of students who took on leadership roles in organizing SDG engagement activities.

Design/methodology/approach – A qualitative thematic analysis was used to understand the experiences of 12 student leaders involved in SDG programming. Semi-structured interviews asked participants to reflect on their key learnings, skills development and overall student's experiences of leaders involved in SDG programming. Thematic analysis was applied to determine emerging themes.

Findings – Analyses showed that taking a leadership role in the SDGA empowered students to deepen their engagement with the SDGs and overcome barriers such as lack of knowledge and feelings of powerlessness. Secondary findings showed that community-building, flexibility and a sense of ownership were key strengths of the program and contributed toward student leaders' feelings of hopefulness, self-confidence and inspiration.

Originality/value – This work offers a window into the experiences of student leaders who have worked to advance SDG engagement within their institution. Our findings suggest that student-led initiatives

represent untapped potential for HEIs to prioritize and support to help deliver on their SDG implementation and engagement efforts. As HEIs offer a vital space for innovation, policy and capacity building towards implementation of the SDGs, this work demonstrates how student leadership can yield grassroots influence on HEI commitments and responses to the needs of students.

Keywords Higher education, Student engagement, Sustainable development goals, Student leadership, SDG engagement, SDG programming

Paper type Research paper

1. Introduction
1.1 Background
The United Nations (UN) Sustainable Development Goals (SDGs) chart a path forward for civil society, governments and the private sector to realize a global future that is resilient, prosperous and just. Comprising 17 global calls to action, the UN adopted the SDGs in 2015 for implementation by 2030 (United Nations, 2015). Despite support from all 193 UN Member States, global progress on the SDGs remains slow [Sachs *et al.*, 2021; United Nations Department of Economic and Social Affairs (UN DESA), 2021]. As 2030 nears, addressing these challenges will require global solidarity, cross-sectoral support, and intergovernmental leadership to deliver on the 2030 Agenda and the 17 SDGs (Sachs *et al.*, 2021; UN DESA, 2021).

Higher education institutions (HEIs) have long been viewed as incubators of innovation in sustainability, through research, curricula and empowering staff, faculty and students as change agents (Barth, 2013; Karatzoglou, 2013). In their 2020 report, the UN Sustainable Development Solutions Network (SDSN) reinforced the critical role of HEIs in helping societies achieve the SDGs. The report called on institutions to implement "Education for the SDGs" (ESDGs), a set of skills, knowledge and mindsets to address the SDGs' challenges and contribute to the transformations needed in society. Importantly, the implementation of ESDGs requires using "transformative learning approaches"' that involve interdisciplinary, multiactor and action-based learning to help students develop these competencies [Cottafava *et al.*, 2019; Sustainable Development Solutions Network (SDSN), 2020; Žalėnienė and Pereira, 2021].

In recent years, there has been growing momentum to mainstream ESDGs at Canadian HEIs, including advancements made to curricula and student engagement programming (Canadian Bureau for International Education, 2020; Universities Canada, 2021). Such movements to implement ESDGs tend to take a "top-down" approach where sustainability teaching and student engagement are administered unidirectionally, with faculty and staff as *knowledge deliverers* and students as *knowledge recipients* (Akins *et al.*, 2019; Brinkhurst *et al.*, 2011; Lozano *et al.*, 2013). However, there is growing recognition that a shift is required from traditional didactic sustainability teaching toward student-centered, transformational learning where students can cultivate personal ownership over their learning (Barth, 2013; Brinkhurst *et al.*, 2011; Filho, 2020; Haddock and Savage, 2020; Savage *et al.*, 2015). In particular, curricular programs that offer inquiry-based, collaborative and experiential learning have been shown to enhance the development of sustainability competencies and promote greater perceived confidence and personal development among students (Block *et al.*, 2016; Ely, 2018; Rios *et al.*, 2018; Savage *et al.*, 2015; Shriberg and MacDonald, 2013).

Students should be seen as the central agents of SDG action in higher education and have the unique capacity to engage in transdisciplinary collaboration and work outside of traditional institutional boundaries (Barth, 2013; Drupp *et al.*, 2012). Although there is a large and growing body of literature on staff- and faculty-led curricular programs that

promote transformational learning and ESDGs, there is a relative paucity of research on the role of student-led, co-curricular initiatives (Albareda-Tiana *et al.*, 2018; Lozano *et al.*, 2013).

This study explores the experiences of students at the University of Calgary who have been involved as leaders and organizers of a student-led initiative advancing SDG engagement on campus. In this research, we aim to better understand the learning processes and outcomes for student leaders and the greater role of student leadership in advancing SDG action in HEIs.

As students and youth ourselves, this work serves to not only enable us to better understand how student-centric SDG programming can be advanced at our campus, but to offer sustainability practitioners within HEI and students alike a window into the experiences of student leaders who were involved in a campus SDG initiative. Ultimately, this work brings forth a call to action for HEIs to consider investing in student-led SDG initiatives as another tool to consider in advancing ESDGs within broader institutional sustainability plans.

2. Context Setting
2.1 Program overview
The Sustainable Development Goals Alliance (SDGA) is a grassroots student-led initiative founded in 2017. It is run out of the University of Calgary through a partnership with the institution's Office of Sustainability. The mission of the SDGA is "to amplify youth voices and action towards building a more sustainable world" through the pillars of student engagement, community training and advocacy. The SDGA aims to equip students with knowledge and skills to engage with the SDGs through events, conferences, focus groups and social media campaigns.

3. Methods
This study explored the experiences of student leaders of the SDGA, hereafter referred to as "participants." The methodological approach for this exploratory study was based on phenomenology and qualitative thematic analysis (Neubauer *et al.*, 2019). This study was approved by the University of Calgary Conjoint Faculties Research Ethics Board (REB20-1307).

Because this study was designed and conducted by past and current students at the University of Calgary, activities involving direct contact with participants, including enrollment and interviews, were conducted by two team members who were not current students. The remaining two team members, both of whom were current students with potential relationships to study participants, worked only on anonymized study data to minimize bias or conflicts of interest.

3.1 Participants
Participants were recruited using purposeful sampling. We recruited participants who took an active leadership role in the SDGA, such as by serving as an executive member, advisor or event planning committee member. Potential participants were identified from a list of previous executive and committee members of the SDGA and contacted via email to confirm eligibility and coordinate interviews. The following enrollment criteria were applied:

- must have directly participated in the leadership, advising or coordination of SDGA programming; and
- must have been a University of Calgary student at the time of their participation between 2017 and 2021.

Out of 39 potential participants, 12 were enrolled. Factors influencing nonparticipation included unavailability, time constraints or lack of response. Written and verbal informed consent was obtained from all participants. Demographic information was not collected.

3.2 Interviews

The in-depth, semistructured interview consisted of 14 open-ended questions (Table 1) covering three topics:

- knowledge of the SDG framework;
- impact of the SDGA on personal development; and
- feedback about the SDGA as an organization.

These questions were designed to understand the participants' baseline knowledge of the SDGs before their involvement with the SDGA and to understand the learnings and experiences from their involvement. Guidelines were developed to help interviewers navigate specific situations, including clarifications, follow-up questions and avoiding leading questions to ensure interpretive validity (SAGE Encyclopedia, Given, 2008). Before interviewing participants, the interview guide was pilot tested with members of the University of Calgary sustainability community who were not eligible to participate. Interviews were conducted virtually via Zoom video conferencing. In total, 12 interviews, each lasting 30–45 min, were conducted from October 2020 to January 2021.

3.3 Qualitative analysis

Interviews were recorded and transcribed with the Zoom video conferencing platform and manually reviewed by two team members to correct errors and remove identifying information. The thematic analysis followed the six steps outlined by Nowell *et al.* (2017).

A list of a *priori* codes was generated initially by the two coding team members. Iterative coding of the transcripts led to the creation of additional inductive codes and modifications to a *priori* codes as a deeper understanding of the data became apparent (Mihas and Odum Institute, 2019; Roberts *et al.*, 2019). Both inductive and deductive coding were used to capture the experiences of participants who were not adequately represented in a *priori* codes (Roberts *et al.*, 2019). The two coders collaboratively coded the first three transcripts to test the a *priori* codes and modify code definitions as the data was being interpreted. The remaining nine transcripts were each coded independently and then reviewed together to discuss alignment with the existing codebook and resolve coding disagreements.

Thematic analysis was performed using higher-level, descriptive codes to better understand the data (Vaismoradi *et al.*, 2016). Individual codes from the transcripts were grouped into themes, based on the relationship between the coded data and its higher level. To capture the depth of meaning in each of the themes, the coders often grouped together a broad array of codes, resulting in the creation of subthemes (Nowell *et al.*, 2017). The initial outcomes of the thematic analysis produced five themes. The coders then reviewed the coded data within each theme to verify its cohesiveness. An iterative process resulted in the recoding and rearrangement of codes to better reflect the key meanings of the data and themes. Following this process, the themes were consolidated, named and finalized to best reflect the meanings contained within the data using a consensus process. Finalized themes were not provided to participants for review. Qualitative analysis was undertaken with NVivo12 (v12.6.1) software.

4. Results

Figure 1 depicts how each of the codes contributed to four emergent themes shaping our understanding of the experiences of student leaders in the SDGA.

#	Topic	Guiding question	Follow-up questions
1	SDG knowledge	Tell me about your interest in the SDGs.	Why are you interested in the SDGs? Which SDGs do you have the greatest connection to or passion for?
2*	SDG knowledge	Tell me about what you know about the SDGs.	How much did you know about the SDGs before you got involved with the SDGA? When did you first hear about the SDGs? Where did you first hear about the SDGs?
3	SDG knowledge	In your opinion, what role should students play in advancing the SDGs?	What are some of the strengths and challenges associated with student involvement in the SDGs?
4	Program improvement	How did you find out about the SDGA?	–
5	Program improvement	Tell me what you know about the SDGA.	–
6	Program improvement	Why did you get involved with the SDGA?	Did you have interests that aligned with the goals? Was your involvement related to your career interests or degree program?
7*	Program outcomes	Tell me about what you have learned from your involvement with the SDGA.	To what extent has being involved with the SDGA expanded your knowledge on the SDGs? How has your involvement with the SDGA influenced your leadership?
8*	Program outcomes	What are your biggest take-aways from your involvement with the SDGA?	Has your involvement with the SDGA influenced your behavior or thinking?
9*	Program outcomes	How have you applied your learnings and takeaways from your involvement in the SDGA?	Can you give me a specific example?
10*	Program outcomes	What is your best memory from your involvement with the SDGA?	Why was this important to you? What impact did this have? What did the SDGA do well?
11	Program improvement	What are the strengths and weaknesses of the SDGA?	
12	Program improvement	Is there anything you would change about the SDGA?	If so, what? Is there anything you would add or take away?
13	Summary	Thank you so much for taking the time to tell me about your involvement with the SDGA. Is there anything else you would like to add?	–
14*	Program outcomes	Have you discussed what you have learned about the SDGs with those around you?	With family or friends? In what context? Did you feel knowledgeable/confident in the conversation? Why or why not?

Note: *Core questions – answer research question directly
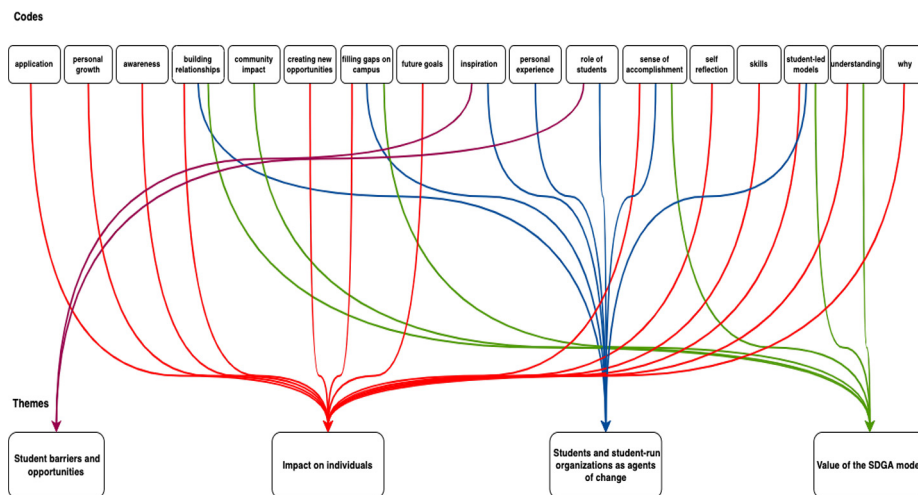
Table 1.
Semistructured
interview guide

Figure 1.
A map depicting the relationship between the codes and themes based on the relationship between the coded data and broader meaning

4.1 Student barriers and opportunities

All participants (n = 12) commented on the challenges and opportunities students face looking to get involved in the SDGs at an HEI.

Participants identified feelings of overwhelm and powerlessness as key barriers to student involvement in SDG advocacy. Specifically, they described feeling overwhelmed by the scale and complexity of the SDGs and the existential threat posed by climate change and continued global inequalities. In addition, participants often felt powerless within HEIs to effect change, because of limited financial capacity, lack of decision-making power and feelings of self-doubt and "imposter syndrome." This combination of overwhelm and powerlessness can lead to feelings of hopelessness and apathy toward global issues.

> [Climate change] is such a looming and huge problem and it has really strong implications for our future [. . .] [we're] bombarded with examples of people going backwards instead of forwards in trying to find solutions for this. So I guess it can feel really challenging and overwhelming for students and they might think, 'well, what I'm doing doesn't really make sense because we're all going to suffer from this and we're not going to be able to solve this problem' [. . .] I've seen a lot of students just becoming a bit, just not really hopeful about the future. – P1M

At the same time, participants identified HEIs as an ideal environment for students to engage with the SDGs, by providing various opportunities through internships, student government, volunteering, research and extracurricular activities. Participants emphasized that students should not feel pressured to tackle all 17 SDGs at once, but rather to focus on a single or select group of goals they are most passionate about.

However, while opportunities for involvement appear abundant, participants noted that students still face challenges accessing them, in part because of lack of information, competing academic work, jobs and personal priorities, as well as limited social connections.

> When I was in my first year, I was so focused on just passing my classes and my mental health that I was not aware of half the opportunities that were really out there [. . .] I think communicating to students what the opportunities are is something that could be improved. – P1D

There is also an urgent need for more in-depth ESDGs in higher education, with participants describing students having limited or superficial understanding of the SDGs. The importance of equipping students with the capacity to advance the SDGs is underpinned by what participants described as a responsibility for young people to take leadership in this work.

> I know a lot of students at [the University of Calgary] aren't totally aware of what the SDGs are or have even heard of them [. . .] so I think definitely the first thing is being aware of them. – P1N

> [Youth] are going to be the ones who inherit [the Earth]. So it's really important for us to [be able] to communicate with our peers and spread awareness. – P1L

4.2 Personal growth

Participants described how the SDGA influenced multiple aspects of their personal and professional development, including increases in knowledge, skills development and self-efficacy. These leadership experiences also informed participants' career goals, values and individual beliefs.

Knowledge. All participants ($n = 12$) enhanced their understanding of the SDGs during their work with the SDGA. Before their involvement, most participants had limited or no exposure to the SDGs, and largely associated the concept of sustainable development with environmental sustainability.

Through their involvement with the SDGA, participants were able to develop a deeper understanding of sustainable development and the interdisciplinary and interconnected nature of the SDGs.

> I didn't know it at the time, but I think [the SDGA] was my first introduction to what we call systems thinking. Especially with the SDGs, knowing that if you're accelerating one, you're most likely accelerating some others at the same time [. . .] as I got further into formal sustainability studies and further into my degree, I realized that the SDGA was like the first introduction to systems thinking, where everything really is involved with each other. – P1E

Many expressed how their involvement led to a growing awareness of current progress on SDG implementation. In addition, many were able to adopt a critical lens to understanding the 2030 Agenda and its strengths and weaknesses. One participant expressed caution at the lack of government commitments and tangible actions on the SDGs:

> It's a dangerous rabbit hole to fall into when you realize that the SDGs don't have any teeth. And that they're just kind of pretty and sitting there [. . .] But what does that mean? What's being done? [. . .] We keep setting these goals. We keep extending these deadlines, but who's doing what? Why is there, like, no collaboration or unification of things? – P1B

In particular, participants emphasized the importance of collaboration between individuals, government, and civil society in implementing the SDGs.

> You can't just leave it to civil society or NGOs or grassroots movements, it's a combination of everyone and everything that has to come together. – P1C

Skill development. All participants ($n = 12$) expressed how they were able to nurture skills such as leadership, teamwork, communication and project management because of their involvement in the SDGA. This growth occurred through learning from peers and having ownership over tasks, such as planning the SDG Summit, collaborating with community partners and running social media campaigns.

> Moving into the co-chair position [has] definitely challenged my leadership skills. Trying to lead a team to create events and have that engagement, especially now, in like an online setting. It's kind of made me take a step back and look at what I think an effective leader would be. – P1E

> I've been trying to gain a lot of best practices [by] watching [previous co-chairs] closely, figuring out what the best way is to approach different conflicts or challenges, and managing my time. – P1F

> [The SDGA] gives something which you have some ownership over [. . .] so I think it's a great thing for students to get involved with. – P1I

Values. Participants' experiences with the SDGA influenced their personal values and perspectives. In particular, many participants resonated with values related to collaboration, openness to new or different perspectives and intersectional approaches to leadership and problem-solving.

> I was a bit involved in recruiting different speakers and different NGOs [. . .] and it just sort of showed the value [of] having that collaborative mindset and being open to hearing the perspectives of other people, and using that to help formulate your own solutions or your own ideas. [My biggest] takeaway was [appreciating] how to work with other people, and involve other people's perspectives and experiences. – P1L

> Being involved with the SDGA has made me realize that I should be looking at issues from an intersectional perspective. – P1K

Future goals. For many participants, their SDGA experience helped inform their future educational and career goals. This occurred both *directly*, where participants were able to access new job opportunities and connections through their work with the SDGA, and *indirectly*, where the SDGA experience helped shape participants' aspirations and expectations for their future career. This impact occurred irrespective of whether or not the participant was studying in a sustainability-related field.

> By learning about the SDGs I've realized that it does relate to my future career goals [. . .] I want to do something where I'm helping other people. And I didn't realize that contributed to the SDGs. So this has enlightened me in a way, I guess. – P1D

> I think [my experience] has inspired me to be involved in other initiatives moving forward [. . .] after I graduated, I wanted to do something similar [. . .] it's kind of inspired me to keep seeking out opportunities to be making a similar impact. – P1J

Furthermore, participants linked the SDG knowledge acquired during their time with the SDGA with their success in navigating career goals and acquiring new opportunities.

> [Starting off] as a student at the University of Calgary and like organizing the SDGA just to get engagement from students, and then moving forward to working with an actual UN agency and seeing how the SDGs, like translate into the work that they do every single day. That was a really incredible experience and I have to credit my involvement with the SDGA for exposing me initially to all of that work. – P1B

Inspiration. Executing events, transforming their ideas into action and reflecting on the collective achievements of students left participants feeling inspired and hopeful about the power and ability of students to advance SDG implementation. Being involved with the SDGA helped students develop a greater sense of self-efficacy and confidence in their ability to effect change.

Groups like the SDGA are so important because it shows that we have the capacity to rally together to fight for the issues that matter to us and what we're passionate about. – P1C

I think it was very impactful, very rewarding to see what students can do when they're given the just essential basic tools and they can really let their imagination just explode and become this really great thing. – P1M

In addition, participants realized that the role of students in SDG implementation extends beyond learning, to also involve community mobilization, advocacy and solution-finding.

It's not just about learning about it and going on with your life [. . .] It's about being part of the movement and meeting people [. . .] It's about creating relations and making things happen [. . .]. – P1M

4.3 Students and student-run organizations as agents of change
Participants (*n* = 11) also reflected on the role of students as agents of change, and the unique contributions of student-led initiatives to SDG implementation in HEIs. Participants emphasized that students are capable leaders who possess unique perspectives and skills, including problem-solving, creativity and digital literacy. In turn, students and student-led organizations such as the SDGA can play an important role in SDG implementation by spreading awareness and engaging in peer-to-peer learning and mentorship.

I think students have every capability to be in leadership positions [. . .] proposing projects, doing research, working with professionals [. . .] to advance SDG completion. – P1K

Anything that's youth led is always very beneficial. It's how you know, youth have their own experiences and a unique perspective. – P1L

One participant emphasized the power of students to influence decision-making and effect change.

Students can play this unique role, just because we are the largest population on campus. So we do have a lot of say, and a lot of collective voice. – P1E

Participants expressed that student-led initiatives can fill the important gaps in SDG implementation at HEIs, due to fewer restrictions and greater flexibility when planning events and advocacy campaigns.

I think having the student lens [. . .] greatly contributes to [the SDGAs] success for sure, because I think there's just certain things that students can provide for other students that staff and faculty wouldn't be able to do. – P1E

Student-led initiatives are uniquely positioned to attract, engage and empower other students. In particular, their proximity to the student population can drive further student engagement, incorporate youth perspectives into institutional decision-making and serve as a source of inspiration. In doing so, student-led initiatives such as the SDGA can help create or enhance a sense of community among student changemakers at HEI.

The role that [the SDGs] can play [. . .] that's like a big debate amongst national governments right now and we need to kind of decide that maybe the UN or the WHO doesn't have the teeth that they need to have to make that change [. . .] at the end of the day, the World Health Organization is just that, it's an organization [. . .] So I think that's the biggest message as well because as much as we want to promote and advocate for more engagement and awareness of SDGs, we also have to paint the whole picture and kind of inform students and society that not

much is being done or not enough is being done. And that's why we need this engagement to fill those gaps. – P1B

[The SDGA] can help connect different students and youth and community groups to the goals as well. It's a really interesting bridge, sort of helping connect these different youth across the world and in Canada towards a collective goal. – P1L

[I've learned that] no one's ever alone in their pursuits to try and reach these type of goals. And that there are others that you can connect with and other people who are passionate about specific topics that are a part of the 17 SDGs. – P1D

Participants reflected fondly on how they developed new connections through the SDGA, and experienced a sense of community among like-minded students. In particular, participants appreciated the ability to interact with students from various backgrounds and degrees of study, and foster relationships with other student clubs, the greater institution and partners in the community.

The connections that I made with people were super invaluable. It was really nice to meet people from sort of different like degrees and backgrounds and ages, who all sort of have a similar interest in the SDGs. – P1N

4.4 Value of the Sustainable Development Goals Alliance model
Participants ($n = 11$) reflected on how the SDGA model facilitated a reciprocal, mutually beneficial relationship between the institution and students. For students, having institutional support, whether financial or in-kind, helped elevate their work and create opportunities for future growth and recognition. One participant shared how partnering with the institution:

Gave us the leverage to get funding, to get resources, to get partnerships with certain organizations [. . .] that is the proof [. . .] of how powerful partnerships can be. – P1C

For the institution, partnering with students allowed for more direct communication and engagement. By fostering a relationship centered in meaningful engagement, student-led initiatives can further an institution's strategic objections and help fill gaps on campus. Participants shared how the SDGA model:

Identified a missing link in the university's culture [and] helped guide the course [for] how we're even measuring sustainability at the university. – P1C

[got] the university [to] acknowledge that the SDGs existed and to integrate that into their overall sustainability strategy. – P1E

In contrast to a student-run club, the SDGA model of student–institutional partnership provided greater programming capacity as well as the freedom to pursue initiatives that may have been more difficult to pursue from within as a staff or faculty member. One participant explained this dynamic as:

[The SDGA is not] as [. . .] restricted in terms of what they can share or do [. . .] they have that freedom to [. . .] be something that's independent from the university at times, which [. . .] allows them a lot more freedom in their message. – P1M

Finally, participants also shared how the SDG framework was used to rally student enthusiasm and action around sustainable development. Participants felt that the universal nature of the SDGs brought together diverse perspectives and

approaches that influenced how programming was developed and how students worked together.

> I definitely think on one of our strengths is how our team is made up made up of people from very different backgrounds, like we have students from all many different faculties from the health sciences, from nursing in business finance and from the arts, and I think that's like one thing that is inherent for the SDGs because it brings in people from different backgrounds and a diversity of perspectives. – P1F

5. Discussion

Social identity theory seeks to use social identity, an individual's self-conception based on their group membership, to analyze phenomena such as leadership, conformity, discrimination and group cohesiveness (Tajfel and Turner, 1979; Hogg, 2016). In this study, student leaders of the SDGA inhabited a unique social identity as *students*, expressing common anxieties, challenges and feelings of overwhelm toward their role in advancing the SDGs. By mobilizing individuals with a deep personal commitment to the SDGs around a shared social identity to fight for change (Barth, 2013; Ginwright and James, 2002), the SDGA created a transformative learning environment where students were able to take ownership over their learning, engage in systems thinking and explore new possibilities (Ayers *et al.*, 2020; Moratis and Melissen, 2021; Larsson and Holmberg, 2018). This in turn allowed for the transformation of *students* as an identity to be used in conjunction with other social identities such as *activist*, *environmentalist*, *ambassadors*, *leaders* and *changemakers*, which emerged from the participants. For example, the Tertiary Students for SDGs Ambassador Program is a student-led initiative to increase awareness and engage students to innovate, develop and implement projects with their HEIs (United Nations, 2019). Students as a social group can be primary drivers of campaigns, alliance and collaborations with faculty, staff and organizations (Maina *et al.*, 2020). The immersive nature of the SDGA enabled students to deepen their engagement beyond the classroom and contextualize their learning to their personal lives, thus facilitating greater self-awareness, empowerment and motivation to take on leadership roles to create change at the systems level.

This study also identified features of the SDGA experience that aligned with Ryan and Deci's (2000) motivational factors to achieve better student learning and engagement: *competency*, *autonomy* and *relatedness*. Specifically, participants enhanced their *competence* by acquiring knowledge and skills and reflecting on their values. They demonstrated *relatedness* by fostering diverse relationships and a sense of belonging with their peers, and exhibited *autonomy* through analyzing the campus context and identifying problems and potential solutions (Dlouhá *et al.*, 2019; Kurucz *et al.*, 2014; Larsson and Holmberg, 2018; Stott and Murphy, 2020). The student identity is the foundation of our discussion on how student-led initiatives foster student leaders and how students can enhance institutional efforts toward the SDGs.

5.1 Fostering student leaders

It is well established that HEIs play a critical role in helping societies achieve the SDGs, through education, research, innovation and leadership (Lozano *et al.*, 2013; SDSN, 2020). Our study found that participants view HEIs as ideal environments for students to learn about and engage with the SDGs, further highlighting the important role of HEIs in fostering student SDG champions.

Although there has been increased activity among HEIs to accelerate SDG implementation and deliver ESDGs, the role of student-led initiatives in this goal remains

largely overlooked (Lozano *et al.*, 2013; Moratis and Melissen, 2021). By providing a self-directed environment for student leaders to engage in practical learning, student-led initiatives such as the SDGA can empower students as agents of change in SDG implementation. Participants in our study highlighted several ways in which serving as a student leader in the SDGA impacted their personal and professional development.

Students are keenly aware of the scale and complexity of the global issues the SDGs seek to address. A growing awareness of the climate crisis, widening social inequalities and lack of progress on the SDGs contribute toward feelings of overwhelm, helplessness and powerlessness among students. Participants identified these emotions as key barriers preventing students from engaging with the SDGs, consistent with previous research demonstrating high levels of climate anxiety and feelings of powerlessness among students (Jenkins and Stone, 2019). However, despite these feelings, participants retained a sense of hope and empowerment through their experiences in the SDGA. In particular, making a difference within the community helped students feel valued and empowered (Larsson and Holmberg, 2018; Lozano *et al.*, 2013). In this way, student-led initiatives that involve experiential, action-oriented and reflective learning can serve as incubators for fostering energized and resilient student leaders (Dlouhá *et al.*, 2019; Ely, 2018; Larsson and Holmberg, 2018; Savage *et al.*, 2015; Syed Azhar *et al.*, 2020).

Throughout their leadership roles in the SDGA, participants developed a deeper and more nuanced understanding of the SDG framework. In particular, their conceptualization of sustainable development evolved from an environmentally focused issue (Zeegers and Clark, 2014) to one that is multidisciplinary, intersectional and interconnected (Barth, 2013; United Nations, 2015; Wiek *et al.*, 2011). In addition, participants were able to adopt a critical perspective of the SDG framework, appreciating both strengths and limitations.

Participants were also able to develop skills in leadership, collaboration, communication and project management, by learning from peers and taking ownership of activities such as event planning, engaging with stakeholders and managing social media. These impacts reflect research in the field of experiential learning, where problem-based approaches have been shown to contribute to higher-order learning and skill development in sustainability (Cottafava *et al.*, 2019; Ely, 2018; Rios *et al.*, 2018; Savage *et al.*, 2015). Participants also formed connections with like-minded students from diverse backgrounds and fields of study, enabling them to broaden their perspectives and experience a sense of community. A strong sense of community has been shown to play an important role in nourishing personal growth among students, and provides unique opportunities to enhance one's collaboration and interpersonal skills (Savage *et al.*, 2015).

In addition to enhancing knowledge and skill-based competency, these findings show that participants carry these learnings forward into their personal and professional lives. Participants reflected on how they developed skills transferable to future work and volunteer positions, accessed new opportunities and gained insight into their career aspirations and personal values. In this way, student-led initiatives such as the SDGA can function as educational spaces that promote higher-order learning, skill application and leadership development (Cottafava *et al.*, 2019; Drupp *et al.*, 2012; Syed Azhar *et al.*, 2020).

5.2 Enhancing institutional efforts to implement the sustainable development goals
Moratis and Melissen (2021) found that the majority of steps taken by HEIs to implement the SDGs represent only superficial ways of integrating sustainability, and neglect to acknowledge the complexities of sustainable development nor recognize the full learning potential of the SDGs. This is similarly seen by Murray (2018), who identified that students sought to expand the narrow confines of approaches that HEIs pursue to achieve

sustainability. Conversely, student-led initiatives such as the SDGA can strengthen institutional implementation of the SDGs. For example, participants identified a need for institutions to better communicate and increase access to opportunities for students to engage in the SDGs. This is a gap that an SDGA-like model could help fill, by increasing awareness of the SDGs, amplifying student work, fostering collaboration and providing a central access point for students to get involved.

HEIs play a vital role in advancing the SDGs by fostering the next generation of student leaders and changemakers through ESDGs. ESDGs requires HEIs to move away from standard pedagogical strategies, and instead adopt transformative learning approaches that are interdisciplinary, action-based and multiactor in nature (SDSN, 2020). This study demonstrates that student-led initiatives, such as the SDGA, use all three of these approaches that offer a means for expanding transformative learning in higher education.

Student leaders of the SDGA acquired a deeper understanding of the SDGs as a result of their involvement, including understanding the interconnected nature of the goals, identifying the strengths and weaknesses of the SDG framework and appreciating the importance of cross-sectoral collaboration in achieving the SDGs (Wiek *et al.*, 2011). In addition, students were able to form relationships with like-minded youth from a diversity of backgrounds, perspectives and fields of study. These outcomes reflect how the SDGA embodied *interdisciplinarity*, by allowing students to explore the interconnections between goals and engage in systems-thinking. Student leaders in the SDGA also engaged in *action-based learning*, by taking an active role in event planning, forming partnerships and collaborating with stakeholders. As a result, participants were able to strengthen leadership, collaboration and communication skills, while also developing a greater sense of self-efficacy and confidence in their ability to create change. Finally, the SDGA was bolstered by *multiactor involvement* and the formation of an institutional partnership with the University of Calgary's Office of Sustainability. Concurrently, the value of student leadership in universities has been recognized as contributing to student learning outcomes, participation, engagement with the institution and retention rates (Barth, 2013; Kuh, 2003). This type of relationship is mutually beneficial in nature, as HEIs can provide funding and mentorship to strengthen student leadership capacity, while student activities can in turn contribute to institutional sustainability and community engagement mandates (Brugmann *et al.*, 2019).

Students play a significant role in advocating for social change (Ginwright and James, 2002). There is a long tradition of youth and student activism in grassroots movements worldwide, where youth leadership has resulted in policy change, organizational transformation and the development of healthier communities and ecosystems (Larsson and Holmberg, 2018; Murray, 2021; Xypaki, 2015). As a demographic, students see the world as a "place of possibilities," and are motivated and willing to challenge the status quo and hold institutions, corporations and governments accountable (Ginwright and James, 2002). In our study, the student-led model itself was identified as unique because of its greater flexibility for problem-solving and its ability to foster relationships between students and organizations. In addition, students bring valuable perspectives and experiences to discussions on SDG implementation, which can complement existing institutional activities. As well, student leaders can encourage and mobilize the largest demographic group in HEIs in collective action toward the SDGs.

Service- and/or community-based learning, such as through student-led models, is more conducive to tackling complex problems compared to traditional education settings. In this model, students are not passive learners, but rather active agents capable of transforming their environments and creating change (Barth, 2013). By creating immersive spaces for students to engage in active learning, problem-solving and community building, student-led

initiatives thus serve a dual purpose for HEIs: to foster empowered and critically engaged future leaders, and to enable students to contribute meaningfully to institutional efforts to advance the SDGs.

6. Conclusion

In light of these findings, this research recommends sustainability practitioners and HEIs to consider the role of students in supporting institutional efforts to implement the SDGs. We suggest HEIs to consider these student experiences in their efforts to develop supportive environments, which are critical for student-led programs to thrive. Through the use of social identity theory, sustainability practitioners and faculty should consider the unique identity students possess in their efforts to learn and advance their education but also to transform their identity as students to leaders. The ability for students to learn, adapt and contextualize their current environment makes them ideal candidates to champion change at HEIs and take these experiences for tackling the complexity underpinning the wicked problems facing SDG implementation. In an environment where HEIs fund and support student-led action and organizations, such as the SDGA-like models, we can see the nurturing of new activists, environmentalists and leaders who can carry these foundational experiences into their future education, careers and communities.

We further identified how the student-led model of the SDGA influenced student leadership development, while also capitalizing on the ability of students to drive change. In contrast to traditional sustainability programming that is staff- and faculty-driven, this study offers a window into the experiences of students who were empowered to co-create, lead and meaningfully contribute to the SDGs through a student-led initiative.

Providing a specific example of a student-led SDG initiative, this study serves as another tool for sustainability practitioners within HEIs to consider how to engage students. By exploring the SDGA at the University of Calgary, this study offers a window into the experiences of students who are involved in SDG engagement activities and contributes to the larger body of research on understanding how students can champion the SDGs within HEIs. However, more research is needed in how HEIs can appropriately engage and support students to develop student-led initiatives.

A limitation to this study was the COVID-19 pandemic, which required the SDGA to pivot to online engagement and digital events. Although successes were found in this rapid change, there were fewer overall opportunities for informal engagement with students that traditionally existed in person, such as information booths or campaigns on-campus. These in-person opportunities could have added additional perspectives to the study and expanded our sample size. The pandemic also required our data collection approach to pivot online.

This study demonstrates that student-led models for SDG action possess unique capacities to foster empowered student leaders while also enhancing institutional efforts to advance the SDGs. Such models present an opportunity for HEIs to hold dedicated space for students to step into SDG leadership positions and create programming that is relevant and responsive to the current realities of students, while allowing learners to enhance their individual and collective leadership capacity.

Given the wickedly difficult problems humanity must reckon within our efforts to implement Agenda 2030, HEIs continue to be spaces for producing not only the innovations to solve these problems, but the next generation of leaders who have the passion, skills and leadership to tackle them. This research has demonstrated the critical value and impact that students play in bringing these changes to fruition.

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