Emerging Leadership Strategies in Environmental and Sustainability Education in Preservice Teacher Education

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Abstract

Environmental and Sustainability Education (ESE) has been a neglected area in teacher education despite the potential it offers for stimulating societal change via the school system. Our work in recent years to promote this aspect of teacher education in Canada led us to reflect on our experiences, the challenges we have faced, and the lessons learned about leading this type of change. The study involved a collaborative action research approach with a series of meetings in which we acted as critical friends and then used coding to identify emerging themes. In this way we were able to identify successful leadership strategies and support each other in our endeavors. By connecting our experiences to theories related to leadership in environmental education, we were able to identify useful leadership strategies. Little has been published specifically related to leadership in this field, so we hope that our findings will assist others in this work and stimulate further research.

Résumé

L'éducation est la clé pour transformer notre mode de vie et nous éloigner des activités qui participent à la destruction des systèmes terrestres nourriciers, le but étant d'adopter plutôt des pratiques garantissant un avenir durable. Devant la gravité des menaces actuelles, plusieurs acteurs du milieu de la formation des enseignants ressentent de la frustration. Toutefois, dans les facultés d'éducation du Canada, des personnes tentent de remédier à la situation. Certains membres du corps professoral comprennent l'importance de fournir du leadership en éducation à l'environnement et au développement durable, souvent dans des circonstances où l'inertie institutionnelle et l'absence d'un public réceptif compliquent le travail. En nous inspirant de notre expérience au sein du corps professoral, nous avons entrepris des travaux de recherche concertée pour définir et analyser les pratiques de leadership qui, selon nous, facilitent le changement systémique des méthodes de planification et de mise en œuvre de l'éducation à l'environnement et au développement durable dans nos facultés d'éducation. En adoptant une approche de recherche concertée et en agissant en amis critiques, nous voulons affiner nos pratiques de leadership et maximiser notre capacité à accélérer les changements systémiques urgents et indispensables au développement durable. Résumé de notre expérience, la présente étude contribue à la recherche embryonnaire sur le leadership environnemental dans la formation des enseignants (Stevenson et al., 2014; Ferreira, Ryan et Davis, 2015; Erhabor, 2018).

Key-words: leadership, teacher education, environmental sustainability

Mots-clés : éducation à l'environnement et au développement durable, formation des enseignants, leadership, recherche concertée, Ontario

Introduction

Education is key to transforming how we live, moving us from activities destroying the Earth's life support systems to ones that ensure a sustainable future. Given the intensity of threats to life on Earth, preparing new teachers for work in Environmental and Sustainability Education (ESE) should be regarded as the prime mission of teacher education programs. That this is not currently the case is a source of frustration for many involved in teacher education. However, there are people in Canada's faculties of education working to address this situation. These faculty members embrace the need to provide leadership in ESE, often in circumstances where institutional inertia and lack of a receptive audience make the work difficult. As three such faculty, we have undertaken a collaborative action research study to identify and analyze the nature of our leadership practices that help to facilitate systemic change in how ESE is planned and implemented in our faculties of education. Adopting a collaborative action research approach and acting as critical-friends, we aimed to refine our leadership practices to maximize our capacity to facilitate urgently needed systemic changes towards sustainability. By sharing our experiences, this study aims to contribute to the emerging literature on environmental leadership in teacher education (Stevenson et al., 2014; Ferreira, Ryan & Davis, 2015; Erhabor, 2018).

Addressing the climate crisis should be prioritized in faculties of education and education at all levels. UNESCO's *Guidelines and Recommendations for Reorienting Teacher Education to Address Sustainability* called on all countries to prioritize this work (Hopkins & McKeown, 2005). Several studies conducted since 2000 have called for greater attention to ESE and Education for Sustainable Development in preparing new teachers. The Council of Ministers of Education, Canada (CMEC) found some evidence of ESE in the school curricula of some provinces but recognized that it was virtually absent from preservice teacher education (Council of Ministers of Education, Canada [CMEC], 2000). Still, by 2012, CMEC found only modest progress in Canadian faculties of education, primarily resulting from the contributions of a few committed people, rather than as a consequence of institutional initiatives (CMEC, 2012). Yet the creation of a provincial policy framework in Ontario, *Acting Today, Shaping Tomorrow* (Ontario Ministry of Education [OME], 2009), did contribute to a heightened interest in ESE in faculties of education, evidenced by a range of new learning opportunities in ESE in preservice teacher education programs in Ontario in the years that followed its release (Inwood & Jagger, 2014, p. 78).

These developments, and more recent progress, largely stems from individual faculty members across the country collaborating, sharing experiences and pushing for pedagogic, programmatic and institutional changes (Karrow & DiGiuseppe, 2019). While it is traditional for institutions (and faculty) of higher education to regard each other as rivals in terms of funding and recruitment, we belong to a group of faculty who believe that the nature of the climate crisis demands that we collaborate to ensure that education embraces opportunities to counter the threat to life on our planet. We undertook this study against this background of passionate commitment from individual faculty members, pitted against institutional inertia.

Literature on Leadership in Sustainability

To better understand our experiences as leaders in ESE, but with limited research on ESE leadership in teacher education for guidance, we examined models of environmental leadership in the general sustainability research literature. Taylor (2012) conceptualized leadership "as a *process of influence* that occurs between leaders and their followers that involves establishing direction" (p.871). Shriberg & MacDonald (2013) noted that sustainability leadership is challenging because of the "wicked" nature of interrelated environmental and social issues, and that ESE requires "a leadership theory and practice suited to cross-boundary, systems-oriented thought and action" (n.p.). This is particularly applicable in teacher education institutions because "Preservice teacher education institutions have achieved notoriety for their tendency to be large and complex organizations that are difficult to change" (Ferreira et al., 2015, p.194).

A growing body of research addresses environmental leadership in general, although these theories are still developing (Andrews, 2012; Shriberg & MacDonald, 2013; Burns et al., 2015). Ideas and principles found in this work can help inform the work of teacher educators, but the limited number of published studies that relate directly to leadership in ESE within teacher education (Stevenson et al., 2014; Ferreira et al., 2015; Erhabor, 2018) point to the need for more work in this area.

For innovation to occur in ESE in teacher education, leadership will need to aim beyond mere fulfillment of assigned roles; it will need to be embedded in sustainability values and driven by personal motivation (Burns et al., 2015; Taylor, Cocklin, Broen & Wilson-Evered, 2011). Taylor (2012) notes that leaders in sustainability are often "champions of change" (p.871); they can emerge at any level within an organization and do not need to be in senior positions. Emergent leaders need to be ready to cross boundaries and create system-level changes beyond their immediate sphere of influence. Since the nature of changes that sustainability demands are system-wide and profound, Bass and Steidlmeier (1999) argue that a model of "transformational leadership" is required to help shift entire organizations toward a "higher ethical purpose" (p.181).

Taylor et al. (2011) proposed an emergent, champion-driven leadership model with initiation, endorsement, and implementation phases. The initiation phase sees an emerging sustainability champion, driven by personal values, seeking to instigate change within their existing sphere of influence. In the second phase, a champion seeks endorsement from decision-makers to help build "advocacy coalitions" (p. 421) and harness colleagues' knowledge, positions of power, and strategic networks to promote change. The implementation phase occurs when champions draw together teams from within and beyond their organizational boundaries to innovate and solve problems. These phases rang true for our team; each of us had been through these stages at different times in our ESE leadership.

The literature also identifies traits characterizing emergent sustainability leaders (Erhabor, 2018; Taylor et al., 2011). These include abilities to self-study, influence others, help others want to achieve high goals, and instill solid philosophical beliefs about the environment based on scientific knowledge. Erhabor believes that leaders who foster environmental education and actualize its goals have comprehensive knowledge, a critical perspective and a solid ethical sense towards our environment. Taylor et al. define champion-driven leadership as a process that occurs within the context of relationships between leaders and their followers: establishing direction and vision, generating motivation, and providing inspiration. With these as broader goals for developing leadership capacities, we began examining our practices individually and collaboratively.

Methods of this Collaborative Action Research Study

Methodological Framework

To better understand and learn from our experiences as emergent leaders in ESE in teacher education, we utilized collaborative action research (CAR), which enabled us to concurrently deepen our understanding of the theoretical models of sustainability leadership while enacting aspects of it in our faculties. Action research positions knowledge and theory as inseparable (McNiff and Whitehead, 2002), as it involves 'learning-by-doing, collaboration, innovation, active and participatory learning' (Cebrián et al., 2015, p.717) and dialogue (Sterling, 2004). We also employed Morrison's (2018) critical-friends group (CFG) model in our approach to CAR, hoping it would assist us in our grassroots work in ESE in higher education, allowing us to compare experiences and to reflect on these with others working as emergent leaders in ESE, and gain insights from knowledgeable and supportive colleagues.

Research Questions

The central research question was: What leadership practices help facilitate systemic change in ESE in our faculties of education? In this exploration, we identified three sub-questions:

i. What have we done to take leadership in ESE in our faculties in the past?
ii. What leadership practices are we currently implementing (with colleagues, students, administrators and the wider community)?
iii. Can CAR help us better understand and leverage our leadership practices in ESE to facilitate change in our faculties?

Data Collection, Analysis and Interpretation

Eight CFG conversations were held from 2019 to 2020 to share experiences and plans, analyze relevant literature, and identify subsequent actions. These were recorded, transcribed, and coded; thematic analysis helped identify emerging patterns in the data, which were compared with sustainability leadership descriptions in the literature. We kept journals that included key documents to reflect on our leadership experiences, considering interactions with colleagues and students, strategies employed, and attempts to instigate change within and beyond our institutions. As is characteristic of action research, there was a fluidity between the iterative cycles of data analysis, interpretation, theorizing and action, helping to deepen our understanding of leadership praxis and informing our leadership practices synergistically.

Limitations

The scope of this study is specific to experiences in three Canadian universities. We aimed more for meaning-making in this qualitative study rather than generalizability for our findings. Knowing each other well may have brought bias and pre-existing assumptions into our analytical discussions, but it also helped facilitate rich conversations in which we felt comfortable sharing our challenges, disappointments, and successes, increasing the relevance of this research to our praxis.

Context

Promoting ESE in Teacher Education at three Ontario Institutions

Paul Elliott, School of Education and Professional Learning, Trent University, Peterborough, Ontario

Trent University recruits graduates to its consecutive Bachelor of Education (B.Ed.) and Indigenous B.Ed. programs, with students entering a Primary/Junior or Intermediate/Secondary stream. In addition, the School offers a

Masters of Education program. Some of the work described here resulted from a collaboration with Jacob Rodenburg, Executive Director of Camp Kawartha.

I moved to Trent University from a university in the UK at the midpoint of my career in teacher education. I joined the School of Education as one of the most experienced members of faculty in a relatively new department. As a member of a small team, I have been called on to teach a number of courses in the B.Ed. program, but have always taught the Intermediate/Senior Biology Curriculum course and was co-creator of a core course in Environmental and Sustainability Education and Indigenous Education.

For over a decade, I have worked to increase ESE content and philosophy in the B.Ed. program at Trent University. Progress has been erratic. It has not always been apparent that I am providing leadership, but when I reflect on what has changed over time, I recognize it as such. My motivation has been influenced by specific authors and colleagues I have worked with. Orr's work (e.g. 1991) helped validate my desire for change in the education system, giving me the courage to persuade others of the need for change. Kimmerer's work (2003, 2013) helped me to reconcile my scientist self-identity with the Indigenous teachings from which, as a newcomer to Turtle Island (North America), I have made efforts to learn and to understand. O'Brien's (2013, 2016) work on Sustainable Happiness revealed the possibilities inherent in helping people appreciate the benefits, to themselves as well as the planet, of adopting an eco-centric mindset.

This action research prompted reflection at a moment when a formal leadership opportunity presented itself—becoming coordinator of the B.Ed. Program brought the chance to set agendas prioritizing the re-evaluation of our program through the lens of sustainability.

Teacher education is often dominated by externally mandated priorities and inertia in the school system, making it difficult to persuade colleagues to address sustainability. Collaborating with colleagues in other institutions stimulates exchanging ideas, sharing leadership tactics, celebrating successes, and nurturing a sense of community. Like many colleagues at other institutions, much of the work I have done has, by necessity, been in the margins of the B.Ed. Program.

The Ontario Ministry of Education's 2009 environmental education policy document provided the opportunity to engage colleagues in a discussion about ESE content in the B.Ed. program (OME, 2009). I proposed and chaired a departmental working group to plan our response. The intensive nature of the B.Ed. Program, timetabling logistics, and a lack of awareness from many colleagues meant practical suggestions had to involve working in the margins. My dean agreed we should start small, implementing a suite of optional workshops as an easy and effective way to align with the policy. Since 2010 the extracurricular Saturday workshops for B.Ed. teacher candidates have run throughout the year and have attracted many participants. They avoid the limitations of the Monday-Friday timetable, side-step the university's course approval process and negate work-load issues since we volunteer our time.

Other teacher educators quickly realized this direct-action model resolved many of their frustrations, and so we saw similar programs launched by several other institutions in our province.

OME's decision in 2016 to extend B.Ed. programs from one year to two years duration presented new opportunities. I led the call for a new ESE component in our program and secured a core course combining this with Indigenous education, another area that had previously been underrepresented. Fortunately, the two topics are intertwined and complementary. The work that I had already done on the margins of the B.Ed. program demonstrated the appetite for ESE work among teacher candidates and was critical in helping secure space for a core course in the revised programming.

The present study prompted me to assess my achievements, how I overcome barriers by seeking practical solutions within the constraints of an existing curriculum, what I still hope to achieve, and how I might best go about this. Lupinacci (2017) captures aspects of my philosophy, writing about leaders needing to pivot away from a traditional egotistical leadership model to one that is "ecotistical" (p.21). Egotistical leadership assumes an anthropocentric mindset with a hierarchical relationship between humans and nature. Lupinacci points out that it is also associated with other superior/inferior dualisms such as man/woman, wealthy/poor, white/person of colour, all of which may have greater resonance with some colleagues in teacher education and thereby offer openings for conversations about sustainability. I have long held an eco-centric worldview, but only over the last decade have I introduced the concept to my students and aligned my leadership with it. As a tenured professor, the security that I enjoy has given me the confidence to do this, but I am also driven by my growing anxiety about the future of life on earth and my desire to help the young develop an ecotistical mindset. I feel now that my leadership is authentic because I am being true to who I am.

Hilary Inwood, Ontario Institute for Studies in Education (OISE), University of Toronto, Toronto, Ontario

When I began to work on ESE at OISE in 2009, I was not a logical choice to become an "emerging environmental champion" (Taylor, 2012) as I was not a recognized expert in ESE, nor in a leadership position in our preservice teacher education programs. As a white, cisgendered settler I had been teaching visual arts education courses at OISE since 2002, but had only recently completed my doctorate (investigating the intersections between environmental learning and arts education). My expertise in the arts differed from the background in science education of many environmental educators in faculties of education. However, with the release of the provincial policy framework in Environmental Education (OME, 2009), an opportunity to better embed ESE across OISE's preservice programs presented itself. As a faculty member in one of the largest preservice teacher education programs in Canada, OISE offered the possibility

of introducing ESE to about 2000 teacher candidates each year in its consecutive and concurrent B.Ed programs, Master of Teaching program, and Master of Child Study programs (all of which offered teaching credentials).

Working with a growing understanding of OISE as an organization and support from key members of the teacher education leadership team, I have collaborated with colleagues and students to establish ESE as a priority at OISE over the last decade, resulting most recently in the launch of our inaugural Sustainability and Climate Action Plan (Ontario Institute for Studies in Education, 2021). With limited literature available on leadership in ESE in teacher education and few models to follow, my approach to leadership (and my confidence) grew organically over time. At the outset, I began integrating ESE into my own courses in visual arts education, designing an elective course in ESE, organizing extracurricular workshops, and forming an ESE Working Group with colleagues and students. Asking for support from program leaders resulted in course release and access to student assistants, allowing the Working Group to support ESE course infusion, organize field trips and student clubs, and offer an annual ESE conference and EcoFair. It also aided in creating a Community Learning Garden (Jagger et al, 2016), a community-created environmental art collection (Inwood & Kennedy, 2020a), and a digital resource hub (https://www.oise.utoronto.ca/home/scan). Over time, collaborating with others not only helped to develop my leadership skills, but also grew ESE across the institution, building connections with faculty who had expertise in Indigenous education, and equity and anti-discriminatory education. Other collaborations with the Toronto District School Board and NGOs led to innovative internships, service-learning placements and inservice teacher education programs (Inwood & Kennedy, 2020b). Learning how to design and deliver year-round professional learning (combining the flexibility of co-curricular learning with the depth of course-based learning) has been key to ensuring multiple entry points into ESE for TDSB teachers and OISE students. It has also demonstrated to me the many benefits of integrating preservice and inservice teacher education in ESE through combining the expertise and resources of faculties of education with K-12 school boards.

There is no doubt that my leadership experiences and skills have grown throughout these experiences, and that I have learned from and with knowledgeable colleagues, dedicated students, and supportive program managers. Finding a like-minded set of colleagues from other faculties of education also furthered my thinking and led to the establishment of a national network for teacher educators focused on ESE in 2017 (http://eseinfacultiesofed.ca). Working with critical friends in the current study has helped me better understand how my leadership capacity in ESE has grown over the last decade. I didn't realize that I was demonstrating some of the principles of sustainability leaders from the outset, as defined by Ferdig (2009); I took responsibility for making ESE relevant to others and sustained momentum through constructive conversations and

authentic relationships. I also drew on the iterative principles of action research by reflecting on and facilitating emerging outcomes, learning to work with paradox and ambiguity. With help from colleagues and students, I have experienced the three phases of champion-driven leadership (Taylor, 2010), from initiating ESE as a new project (initiation) to building coalitions of support (endorsement), and most recently, beginning an implementation phase that aims to institutionalize ESE, sustainability and climate action across OISE and the University of Toronto. Throughout this study, reflective journaling, literature reviews, and critical discussions have led me to wonder if I could have been a more effective leader had I known more about sustainability leadership when I began this work. I also acknowledge that I have been developing my leadership skills while helping my students and TDSB teachers develop theirs. It is rewarding to see those I have mentored stepping into leadership positions in schools and NGOs, beginning their journeys to becoming "emergent environmental champions" in their own right (Taylor, 2012.)

Yovita Gwekwerere, School of Education Laurentian University, Sudbury, Ontario

Laurentian University offers a five-year Concurrent Bachelor of Education degree program, with students entering the Junior/Intermediate teaching stream. Compared to other teacher education programs across Ontario, we have a small program, graduating approximately 100 students yearly. With a small full-time faculty complement, sessional instructors teach most courses, creating challenges in developing new courses. As the only science educator in the School of Education at Laurentian University, I automatically became the ESE go-to person for reviewing a draft of the provincial policy framework on environmental education (OME, 2009). Although the school was not required to address the new policy framework, I was moved to act by personal sustainability values (Burns et al., 2015), coupled with a broad environmental understanding and a robust ethical sense towards our environment (Erhabor, 2018). My environmental sustainability journey dates back to the late 1990s when I came across articles on climate change, and I integrated the readings into the ecology course I was teaching. Twenty years later, the new policy on environmental education provided opportunities for integrating ESE into the science pedagogy courses, researching the understanding of ESE among preservice teachers and hosting lunchtime workshops for preservice teachers to introduce the EE policy framework. I contacted colleagues within my program to collaborate on projects where students integrated the environment in Science, Music, and Literacy. In 2010, I facilitated the launch of an Outdoor and Environmental Education club by B.Ed. Students. These events legitimized the beginnings of my emergence as an ESE leader. During this initial phase as an emergent leader (Taylor et al., 2011), I worked on the margins, integrating ESE into preservice teacher education in areas within my control.

The endorsement of ESE as a requirement in our five-year preservice program has been challenging due to the programming limitations of our small program, but I have persevered. The ESE work on the margins "tilled the soil" and helped launch action when opportunities arose. The opening of a new School of the Environment (SOTE) in 2014 at our university allowed the adoption of new strategies and tactics to navigate institutional structures (Kezar et al., 2011). A cross-appointment to the SOTE provided opportunities to collaborate on environmental sustainability research and teaching. I designed an elective ESE course for Education majors and non-majors. Although not a required course, the enrollment of Concurrent Education students in the elective ESE course increased over time. The course utilized transformational learning strategies that emphasized experience, critical reflection, dialogue, collaboration and taking action (Taylor, 2008) and fostered leadership by helping students see themselves as transformational leaders who could enact change and influence others (Burns et al., 2015). Ideas from environmental educators who advocate for integrating participation in the education curriculum (Cutter-Mackenzie, 2010; Youniss & Levine, 2009; Orr, 2004) and ESE colleagues supporting Eco mentoring projects helped shape these course experiences. The process of implementing ESE in teacher education through the SOTE program has been similar to what Kezar et al. (2011) and Meyerson (2003) call "tempered grassroots leadership". According to Meyerson (2003), "tempered leadership tends to be less visible, less coordinated, less vested with formal authority, more opportunistic and more humble" (p. 171). Meyerson (2003) adopted the grassroots leadership concept from social movements, and views grassroots leaders on campus as the organization's conscience, often bringing up ethical and societal issues such as climate change.

Working with the CFG model allowed me to reflect on and learn about my ESE leadership style. I possess the qualities of sustainability leadership rooted in understanding the connectedness of systems and values that lead to addressing complex sustainability challenges in an inclusive, collaborative and reflective way (Burns et al., 2015). I possess emergent sustainability leadership traits (Erhabor, 2018; Taylor et al., 2011) that include abilities to self-study, influence others, and instill solid philosophical beliefs about the environment based on scientific knowledge. I have continued to expand my circle of influence by creating partnerships with other emergent leaders at local, national and international levels. Collaborative work with emergent ESE leaders across Canada resulted in a co-published book on ESE in Canadian teacher education (Karrow & Giuseppe, 2019). Together we became founding members of a national network of emerging ESE leaders advocating for system-wide integration of ESE in preservice and in-service teacher education. Additionally, I understand that the complexity of sustainability problems such as climate change presents adaptive challenges within multiple systems (Parks, 2005), requiring a global perspective. While I have initiated and implemented ESE in teacher education

from the margins, working with a CFG has enriched my understanding that emergent leaders drive change by involving other leaders (Taylor et al., 2011) and has provided opportunities for growth as an emerging ESE champion in teacher education.

Findings and Discussion

This section discusses the themes that emerged from the data to address our questions about the types of leadership experiences we have used to deepen ESE in our faculties of education and CAR's usefulness in this process.

Understanding past leadership experiences

Our initial experiences leading ESE in our faculties were similar; we had no role models and did not intentionally seek out ESE leadership. Instead, we were motivated by our environmental values and deeply-held beliefs that all levels of education must contribute to creating a sustainable future. Burns et al. (2015) describe sustainability leadership as being embedded in sustainability values and driven by personal motivation, rather than aimed at simply fulfilling an assigned role (Taylor et al., 2011). Our shared area of expertise being preservice teacher education, we recognized this as an arena well-positioned to influence the next generation of teachers regarding the importance of ESE in K-12 learning contexts.

We started modestly leading ESE learning in our programs by embedding ESE in our courses and organizing extracurricular workshops. This demonstrated our commitment without requiring formal permission. As Paul noted in one of the transcribed CFG conversations analyzed for this study, "we weren't proposing a new course, we weren't promoting anything that had to be approved by the university committee system, we weren't proposing anything obligatory, and we weren't looking for any personal recompense for doing it." As student attendance at ESE opportunities grew, we became bolder and sought other ways to bring ESE into the conversation, both in the margins and in the centre of our programs through meetings, working groups, courses and extracurricular events. Being consistent (and persistent) voices for ESE was critical in being positioned as grassroots leaders (Kezar et al., 2011; Meyerson, 2003).

Collaboration with colleagues and students was central to our leadership roles. We sought others who shared our concerns about climate change and interest in sustainability and found ways to connect these to their passions. Paul reflected that "you never know who's going to be a friend or who's going to come along to champion your big idea. You don't necessarily have to be the person who makes the big idea happen, but if you put it out there, someone else might." Paul's early connection to an educator at a local environmental education centre supported the development of Trent's Eco-Mentor Program,

and building relationships with Indigenous scholars was fundamental to getting an ESE and Indigenous Education core course into their B.Ed. Program. At OISE, Hilary helping to establish an ESE Working Group proved critical, as did making connections at the local school board and not-for-profit organizations, helping bring expertise to expand programming. For Yovita, embedding ESE into her courses led her to join committees to locate others interested in advancing ESE in other parts of her university. Through these experiences, we exhibited traits identified in the literature as characteristic of emergent sustainability leaders (Erhabor, 2018; Taylor et al., 2011). We began to understand better the power of building relationships as part of a systems approach to growing ESE leadership. We recognized that getting others engaged, inside and outside of our programs, was necessary for building momentum, as was taking every opportunity to embed ESE into preservice teacher education, given the complexity of our programs.

Identifying current leadership practices

We became increasingly aware that in the early years of our leadership in ESE in preservice teacher education, we learned through trial and error, and by addressing challenges as they arose. We only became aware of how these strategies exemplified recommended leadership practices as our study advanced; what follows is a summary of some of the leadership practices we enacted.

Leading with place in mind

While faculties of education have some common features, each is distinct in its structure, function, power dynamics, internal faculty and general university regulations. Understanding these is central to instigating change and exercising successful leadership. During the initiation phase (Taylor, 2011), Yovita and Hilary began by working in the margins of their institutions, finding places to establish roots for ESE where possible, even if modestly in the early years. Working in a smaller university, Paul was able to step into a variety of B.Ed. Program leadership roles over time, which helped him to understand potential ways to embed ESE. He spoke of "embracing leadership roles" as they arose: "I didn't see this coming, but when it came, I thought, 'that's a great chance to do this.'" The three of us were driven by personal values, seeking to instigate change within our existing sphere of influence (Taylor, 2011).

Starting small, doing it well

Initially instigating change within our spheres of influence, we were able to model change without causing anxiety for our colleagues. Yovita noted the hesitation that she felt from her colleagues: "We are living in a culture where you don't feel like you have enough knowledge [about climate change] or you don't feel like you can teach others, but anyone can teach it [ESE]." We grew

to understand that we were following the traditional advice to environmental educators: starting small to gain support for ESE, and demonstrating that the work can be done well to build trust before scaling up. Small steps were not what we desired, but they accumulated over time and led to strengthened relationships, community-building, and a growing impact in our institutions.

Balance patience with action

Instigating change can be a daunting prospect when faced with institutional inertia, lack of understanding and, in some cases, active resistance. This can be demoralizing when seeking urgently needed changes, such as preparing teachers to facilitate learning in a climate crisis. Leadership requires patience, but this needs to be balanced with strategic action. Small successes accumulate and gradually prepare the ground for more fundamental shifts by demonstrating need and helping to recruit allies. Hilary reflected on this when discussing the importance of asking for support from B.Ed. Program leaders: "I've rarely had anybody say 'no'. Maybe they don't give you exactly what you asked for, sometimes they give you something different, but if you can make that work, often that builds a bit of a history with that particular person… then when you come back a second time to ask, they say, 'well you made that first thing work, so let's try the second thing this time'." Hilary demonstrated characteristics of what Taylor (2011) described as a champion, someone who seeks endorsement from decision-makers to help build "advocacy coalitions" (p. 421), aiming to engage those in positions of power and strategic networks to promote change.

Creativity is key

On encountering obstacles, our leadership strategy drew on lateral thinking and creativity to identify alternative approaches and opportunities; bypassing the need for approval and side-stepping institutional bureaucracy offered the quickest and easiest routes to change. This "low-hanging fruit" was often a good way to maintain momentum for change and benefit from the positive emotions associated with achievement. Paul cited an example of this at Trent: "The Eco-Mentor Program did two things. One, it showed that there was a demand for that sort of thing, and two… it got some of the most positive feedback of the whole [B.Ed.] program. Those two things combined really helped us claim the space for the new core course [in ESE and Indigenous Education]." We often discussed that we should not shy away from creative thinking on a large scale as the need for change is urgent. Hilary cited the example of how "dreaming big" about a Climate Summit at OISE was realized towards the end of the study; she could never have imagined this happening in the early years of her ESE leadership. This form of grassroots leadership on campus is described by Meyerson (2003) as an organization's conscience, often bringing up ethical issues in society such as climate change.

Scale change up and out

Engaging in leadership at various scales simultaneously proves to be an effective strategy. Working within one's institution and beyond offered us the prospect of advances on multiple fronts. It was not always possible to predict where gains would most easily be made; sometimes, gaining in one area would help to stimulate change elsewhere. Working beyond one's institution helped in other ways, too, as Hilary put it: "the more that we can get people involved in leadership in the work that we do, it reduces the load on us individually, helps to show that there is a broader base, and helps people to feel connected" to ESE in our institutions. Paul concurred, noting that this can be an effective leadership strategy: "stirring up the masses makes the person in charge more likely to say yes." This aligns with Taylor's (2012) conceptualization of leadership "as a *process of influence* that occurs between leaders and their followers that involves establishing direction" (p.871).

Empower others

Finally, it became clear that building relationships, sharing ideas, and collaborating helps to empower others in addressing the climate crisis. Hilary spoke of this as an emerging leader: "I'm not going to be director of the B.Ed. Program, but I can help other people see some bigger, wider ideas that we need to be working on, and I can work on harnessing their energy." This highlighted how others contribute to change, from students advocating for embedding ESE into courses to faculty collaborating on extracurricular learning. Highlighting what others have contributed to ESE helps demonstrate that the sought changes are neither unreasonable nor unusual. These leadership qualities align with Taylor's (2012) understanding, describing emergent leaders as ready to cross boundaries and create system-level changes beyond their immediate sphere of influence.

Using Collaborative Action Research to understand ESE Leadership

Our third sub-question for this study queried whether a CAR approach would help us better understand our experiences as emerging leaders of ESE. While we did not have prior knowledge of leadership theory in ESE, we often adopted and modeled the strategies that we later found in the published literature. Taking time to reflect on our experiences and connect these to existing models of emergent leadership (Taylor, 2012), ecotistical leadership (Lupinacci, 2017), and tempered grassroots leadership (Kezar et al., 2011) helped us understand our leadership practices better, refine them over time and share them with others. The CFG model (Morrison, 2018) provides a safe space to reflect, motivate and learn. Some profound insights include Yovita's reflection on how the tempered grassroots leadership style (Kezar et al., 2011) that enabled her to overcome bureaucratic challenges can be ramped up by challenging the status quo. She benefited from Hilary's scaled-up practices to become an emerging

champion (Taylor, 2012) by "brokering information, challenging the status quo and suggesting new ideas." Hilary unwittingly quickly slipped into the role of being an agent of sustainability (Taylor, 2012, p. 8). Paul's ecostical leadership (Lupinacci, 2017), guided by his ecocentric views, provides hope for realizing possibilities and developing ESE leadership that stems from the authentic self.

The key findings show that using CAR, integrated with the CFG model, provides insight into the leadership practices we have enacted in our faculties of education as emergent leaders, building momentum from the bottom-up (Taylor, 2012). Our leadership practices started small, motivated by ecocentric values (Lupinacci, 2017) while working in the margins of our institutions to establish the roots of ESE, thus demonstrating a form of "tempered leadership" (Meyerson, 2003) that balanced patience with actions, persistence and creativity. As we faced obstacles, we sought creative solutions that led to "transformational leadership" (Bass & Steidlmeier, 1999) and helped shift entire organizations, scaling change up and out as we empowered others. For example, the Eco-mentor program showed the demand for ESE and helped create space for ESE as a core course at Trent University, and dreaming big led to a successful climate summit at OISE. However, some key questions also arise regarding whether we should be trying to lead from within the system, or working to change the system and promote systemic change.

Conclusion

In this study, we used collaborative action research and a critical-friends model (Morrison, 2018) to reflect on our practices and identify the nature of leadership that facilitates systemic change in teacher education. We identified some key challenges ESE leaders face in teacher education, such as finding room for ESE courses in programs, gaining administrative support, and lacking ESE knowledge among colleagues. We have summarized some of the leadership strategies we used to transcend these challenges, which form the basis for the recommendations we give to others beginning this work: starting small and doing it well, leading with place in mind, balancing patience with action, being creative, scaling change up and out, empowering others and collaborating with like-minded colleagues within and across institutions. Unlike other leadership forms that are top-down in nature, emergent ESE leaders are champions who drive change from the bottom-up, motivated by personal sustainability values, adopting an ecotistical mindset (Lupinacci, 2017) and learning how to navigate institutional structures. Further research involving more ESE educators is needed to understand the diversity of ESE leadership strategies and how leadership in teacher education, ESE, and climate action differs from other sustainability leadership forms. Research needs to also focus on developing leadership capacities in our students, as they will be leading ESE in schools and faculties of education in the future.

Given the nature of collaboration on this study and the writing of this article, the authors share authorship of this text equally. They also declare that there is no conflict of interest in conducting this study and writing this article.

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Hilary Inwood is a teacher educator, researcher, and artist who leads the Sustainability & Climate Action Network at the Ontario Institute for Studies in Education at the University of Toronto, and teaches a range of graduate courses. She coordinates a large-scale collaboration between OISE and the Toronto District School Board focused on teachers' professional learning in ESE. She is a co-founder of a Canadian national network that aims to better embed ESE into teacher education, and co-leads a new national project on Climate Change Education.Her research focuses on deepening teachers' knowledge and skills in environmental learning as well as on developing creative approaches to ESE in educational settings.

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