

Growing
Garden-Based Educators

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Abstract

Garden-based learning (GBL) is resurging in popularity in reaction to a confluence of crises. These crises, involving social inequity, vast economic disparity, ecocide, and mass extinction, threaten human well-being and survivability of countless species. GBL is positioned by proponents as a means of empowering participants to mitigate and adapt. Often unprepared and unsupported, educators seek to sustain and scale success to enjoy the cornucopia of well documented GBL benefits. Through eight in depth interviews with diverse garden-based educators across three provinces and varied settings, we interrogated the meaning of success in the educational garden while mapping an ecosystem of current and imagined support. Cultivating joy, engaged learning, empowerment, and fostering healthy relationships within and between students and their community and environment were highlighted as the primary goals of garden-based educators. Educators interviewed desired GBL-friendly policies including funding and infrastructure, curriculum-integrated GBL resources, training at all career stages, and community-based support. Consequently, Faculties of Education are uniquely positioned to cultivate and support a thriving GBL ecosystem. Ultimately, critical garden pedagogy adds to the transformation of education to promote the well-being of all humans and diverse life on Earth.

Keywords: Garden-based learning, school gardens, pre-service teacher training, food literacy

Table of Contents

Table of Contents

Acknowledgements.....	2
Abstract.....	3
Table of Contents.....	4
Chapter 1: Introduction.....	8
1.1. Personal Introduction.....	8
1.2. Research Context.....	10
1.3. Purpose of Study.....	13
1.4. Research Questions.....	14
1.5. Study Significance.....	15
Chapter 2: Literature Review.....	18
2.1. Introduction to literature review.....	18
2.2. History of GBL.....	19
2.3. Situating “Critical Garden Pedagogy”.....	22
2.3.1. GBL as Hands-on, Experiential, and Place Based Education.....	26
2.3.2. Climate Change Education & Food.....	27
2.3.4. Public Pedagogy.....	28
2.3.6. Ecopedagogy.....	29
2.3.7. Indigenous Pedagogy.....	30
2.4. Measuring Success.....	31
2.5. Benefits of GBL.....	32
2.5.1. Civics, Inclusion, & Social Justice.....	33
2.5.2. Health.....	35
2.5.3. Academics.....	36
2.6. Barriers to Garden-Based Learning.....	38
2.7. Support for Garden-Based Educators.....	40
2.7.2. Non-profits, Partners & Community.....	40
2.7.3. Formal Teacher Training.....	44
2.7.4. Board Policy & Professional Development.....	45
2.7.5. Informal Teacher Training.....	46
2.8. Conclusion.....	46

Chapter 3: Methods “The Seed Model of Research”	48
3.1. Rationale for Qualitative Research Design	48
3.2. Phenomenological Research & Grounded Theory	48
3.3. Descriptive Research	49
3.4. Transformative Approach	49
3.5. Benefits to Participants	50
3.6. Benefits to Society	50
3.7. Interview Setting	51
3.8. Population Selection	51
3.9. Research Toolshed	52
3.9.1. Semi-Structured in Depth Virtual Interviews	53
3.9.2. Interview Structure	53
3.10. Ethics	53
3.11. Data Handling Protocols	54
3.12. Secondary Data from SCDSB, Focus Group	55
3.13. Results & Analysis	55
3.13.1. Reflexivity of Researcher	57
3.14. Study Limitations	58
Chapter 4: Results	61
Part 1. Participants’ Context	61
Part 2. Defining Success?	63
Part 3. Documenting Support for Educators.	66
Thematic Analysis of Word Usage	73
Summary of Findings	77
Chapter 5: Discussion	80
Introduction to Discussion	80
Part 1 - Formative experiences	80
Part 2 - Success & measurement	82
Part 3 - Support systems	86
Recommendations for a critical garden pedagogy	88
Recommendations to establish a thriving and resilient GBL ecosystem	90
GBL advocates & demonstration sites	90
Post secondary institutions & faculties of Education	90
Municipalities	93

Food Policy Groups	94
Public Health Departments	94
Ministry of Education, Curriculum and Educational Policy	95
Individual Schools	96
Administrators, Trustees & School Boards	97
Teachers	98
Parents	98
Students	99
Third-party organizations	100
Summary of Discussion	102
Chapter 6: Conclusion.....	104
Contested Space	104
Recapping Research Question & Purpose.....	105
Why this research is important.....	105
Research methodology and limitations	106
Concluding thoughts about the potential of GBL to transform education	107
Thesis Epilogue.....	109
References.....	110
List of Tables	125
Table 1	125
Table 2.....	127
Table 3.....	128
Table 4.....	129
Table 5.....	131
Table 6.....	133
Resources	134
Funding Sources	135
School Garden Resources, How to Guides, Best Practices, Activities and Lesson Plans...	135
Formal Teacher Training (B.Ed.)	137
Ongoing Professional Development.....	137
Community Organizations & Networks (Canada)	137
Policy Statements	138
Appendices.....	140
Appendix A: Certificate of Completion for the Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans Course on Research Ethics (TCPS 2: CORE).....	140

Appendix B: Invitation and informed consent form for interview.....	140
Appendix C: Interview questionnaire template.....	143
Appendix D: Email Invitation.....	146
Appendix E: Social Media Interview Invitation	146

Chapter 1: Introduction

1.1. Personal Introduction

Imagine a school in every garden and a garden in every school. As a community gardener, seed librarian, farmer, and a student of education, I have witnessed firsthand an increasing interest and participation in garden-based learning (GBL) across society and within educational institutions. GBL has been defined as “an instructional strategy that utilizes a garden as a teaching tool” (Desmond, Grieshop, & Subramaniam, 2004, p. 9). In its broadest sense, GBL takes place wherever and however people garden. As a lifelong gardener - a toddler in my father’s overflowing balcony garden in Toronto, a child in our big backyard vegetable garden on the family farm, a community gardener around Orillia and Toronto, and now a farmer-educator - I have found meaning and purpose by growing food and community.

My entry into adulthood, and my first year away from home at the University of Toronto, coincided with the 2008 financial crisis. As I soon learned, crises and gardens tend to grow together (Calvet-Mir & March, 2019). The following winter on February 28th, 2009, I attended a Seedy Saturday seed exchange at Wychwood Barns in Toronto, co-organized by the Toronto Community Garden Network (Newman, 2001). I was so inspired by the hive of urban gardening activities that the next day I decided to seed the idea of a community garden network in Orillia, a project I called the Orillia Community Gardens. It was through community gardens that I had hoped to promote a more socially and ecologically just world that I so often envisioned. Through a letter to the local newspaper and a Facebook group by the same name, it wasn’t long before hundreds of people in Orillia and nearby communities had responded to the idea. Within weeks we held our first meeting at a non-profit housing complex which would serve as the location of our first community garden. The diversity of community members and their motivations

represented at this meeting inspired me unlike anything else I'd experienced, and I felt a calling to work to cultivate a community of community gardens - to connect people with each other and the knowledge and resources to grow their own food. Participants expressed interests in health and wellness, climate change and the environment, education, recreation, spiritual and cultural connections, economic concerns, and many others.

It wasn't long before parents, social workers, health professionals, and teachers came to participate in the community gardens hoping to connect children to meaningful learning opportunities. As a 20-year-old man, I, too, thought that this youth-led gardening movement should prioritize youth leadership, engagement, and participation, given the higher proportion of children and youth experiencing food insecurity compared to adults (Tarasuk et al., 2019). Subsequent community gardens were created explicitly in partnership with youth organizations like the Orillia Youth Centre, the Boys and Girls Club of Simcoe Muskoka, and others focused on youth criminal justice, youth social services, and local schools. In these contexts, as a volunteer and without preparation or official training, I was thrust into the position of a garden-based educator for youth, especially for youth-at-risk, and in the end, people of all ages. Witnessing transformations in attitudes and behaviours among youth participants through their engagement in the community garden further encouraged me along this path. Through my undergraduate studies in sociology, I began mapping community gardens, school gardens, and the local food movement more broadly - so that I could better serve as a pollinator - connecting and supporting otherwise disconnected people and communities through the sharing of seeds, food, resources, and knowledge.

Through this passion for garden-based learning, I have become more than just a garden-based educator (GBE) - I help to educate garden-based educators. Through the Faculty of

Education at Lakehead University Orillia, I have personally engaged with hundreds of teacher candidates at the primary and junior level on the topic of GBL and school gardens. As a community member, I have facilitated over a dozen professional development opportunities for over 250 teachers and outdoor educators on GBL in Ontario, with organizations like the Simcoe County District School Board (SCDSB), the Ontario Society of Environmental Educators and the Council of Outdoor Educators of Ontario. Along with teachers in the SCDSB, our team at Bass Lake Farms regularly engages elementary school students for GBL opportunities, upon which students have expressed transformative results to their teachers and parents, and from them to us. Building upon this success, in October of 2019 we hosted a dozen Student Success (SS) teachers and the principal of the SCDSB SS program for an introduction to GBL. Once the Covid-19 pandemic struck, we pivoted to developing virtual GBL programs for local schools at both the elementary and high school levels. It has become clear to me and others (Blair, 2009) through these experiences that many teachers in the SCDSB and beyond do not have the benefit of personal and professional training in GBL.

1.2. Research Context

Over the past thirty years, gardens in their various forms have been experiencing a comeback appearing everywhere there is space including churches, parks, schools and even surviving the transfer of power at the White House starting with Michelle Obama and through the Trump and Biden presidencies (Bryant, 2021). Since the 1990s, school gardens have emerged as responses to the so-called childhood obesity epidemic and malnutrition (Johnson-Jennings et al., 2020). “If kids grow kale, kids eat kale” (Finley, 2013) is a popular refrain among advocates aiming to empower children and everyone with the knowledge and skills to make better food choices to reduce the likelihood of diet-based negative health outcomes.

By the time of the Great Recession in 2008, local food gardens took on a sense of necessity amid growing economic uncertainty and an opportunity to counter the dominant trend towards privatization and model a commons-based economics (Cangelosi, 2015). By the early 2000s *The Last Child in the Woods* coalition (Louv, 2008), offered school grounds including gardens as a place where increasingly urban, and more specifically, sedentary, and screen-addicted youth could experience nature and an outdoor education nostalgically embraced by previous generations. Environmental awareness, especially around the climate crisis, continues to drive interest in school gardens and the broader local food movement.

In the spring of 2020, Covid-19 shut down schools and economies across North America and the world as part of an unprecedented pandemic response, sending panicked and masked families into overcrowded grocery stores. The sight of empty grocery store shelves, and the widespread stay at home orders, helped to inspire a record number of people to start a food garden that spring (Agri-Food Analytics Lab, 2020). According to the Agri-Food Analytics Lab (2020), nearly one fifth of Canadians, predominantly well-educated people with land access, started growing food at home for the first time. Of this group of new gardeners, two thirds who had children were motivated to teach them new skills and knowledge (Agri-Food Analytics Lab, 2020). As schools return to in-person classes, school gardens could be a strategy to bring students outside - not just to learn about healthy food, nature, and essential life skills - but to ensure adequate physical distancing. A similar conclusion was made by school garden proponents over a century ago, understanding the health benefits of open air and physical exercise in preventing and recovering from tuberculosis and other transferable diseases (Potts, 1914).

In its 2014 report, “Achieving Excellence: A Renewed Vision for Education in Ontario,” the Ontario Ministry of Education (2014) included promoting wellbeing as one of its key goals for education, noting the important links between holistic wellbeing (cognitive, social, physical, and emotional) and academic success. School gardens are mentioned several times throughout the Ontario Ministry of Education’s “Foundations for a Healthy School: A companion resource to the K-12 School Effectiveness Framework” (2014) as an activity that can improve the social and physical learning environment and student engagement to promote wellbeing.

In the fall of 2020, Progressive Conservative MPP Daryl Kramp introduced Bill 216, Food Literacy for Students Act, 2020 into the Ontario Legislature where it received all party support in its first debate (Food Literacy for Students Act, 2020). Bill 216 explicitly aims to amend the Education Act in Ontario to make food literacy programs, including garden-based learning, mandatory for all grades in an effort to impart the “essential life skills and the knowledge and confidence to grow, prepare and choose healthy food that will support positive health outcomes and help reduce health care costs” (Food Literacy for Students Act, 2020, p.3).

More recently, the Ontario government updated its Kindergarten to Grade 8 Science and Technology curriculum to include food literacy (Ontario Education, 2022). This update explicitly highlights and encourages educators to plan programs surrounding food literacy as one of a few distinct and important areas of focus that promote cross-curricular and integrated learning for “effective and inclusive science and technology programs” (Ontario Education, 2022, p.79).

Supported by the Coalition for Healthy School Food (n.d), the federal government is in the process of establishing a Canada-wide school food program, which could transform food literacy programming encouraging more experiential food skills education including GBL (CBC, 2022).

As the conditions which have preceded the rise of learning gardens press on, we may expect an ever-greater demand for the foreseeable future. On the precipice of learning gardens becoming mandatory sites of learning in a modern Ontario curriculum (Food Literacy for Students Act, 2020) and the fall out of the pandemic, teachers are asked to adapt to a radically different learning environment. As teachers face increasing expectations to integrate food literacy, including gardening, into the curriculum and their classrooms - many lack the benefit of formal evidence-based training and support.

1.3. Purpose of Study

The purpose of this study and this thesis is to explore the phenomenon of GBL from the perspective of educators, predominantly within formal educational settings. More specifically, this research asks the question of how supporting GBE can influence GBL success. As a Master of Education student at Lakehead University in Orillia, I am surrounded by educational researchers, teachers, and teachers in training. As a local farmer I am surrounded by people wishing to learn about food and how to grow it themselves. It has come to my attention that many educators lack access to formal and informal garden-based learning support systems and resources. Therefore, they may not provide their students with this timely, integrative, and potentially mandatory curriculum expectation. If educators do offer GBL opportunities, they may not be prepared to apply GBL to its full potential, or worse, negatively affect students and their learning environment. Gardening programs that fail to acknowledge or challenge oppressive educational forces can perpetuate them. Without adequate training and support, there is a risk of blighting the landscape with abandoned and overgrown school gardens and or cynical students, teachers, parents, and administrators due to wasted resources. In my experience, overgrown or weedy school gardens have often been seen as synonymous with failure especially by

administrators, some teachers and onlookers. However, we must appreciate the opportunity to reframe our conceptions of success to be more inclusive beyond western agrarian or productivist measures that may consider only readily quantifiable outcomes and surface level appearances, such as how many pounds of produce was grown – or how well weeded the crops are or the uniformity of the surrounding lawn. Educators that measure their success narrowly based around how nice the garden looks, may be forever chasing an unachievable and perhaps counter-productive aesthetic ideal, which may detract focus and attention away from the deep value that learning gardens offer. Teachers are first and foremost educators, not horticulturalists, as such, the learning garden is not simply a horticultural exercise, it is about education first and foremost.

The rich, well aged, and turned compost pile that is the GBL literature showcases its potential to deliver a diversity of beneficial opportunities to students and society, increasing health and wellbeing, ecological and social justice, academic scores, and more. The primary goal of this research project differs from the bulk of recent GBL research which mainly explores the benefits of GBL for students. This research considers teachers and educators experiences in garden-based learning and specifically their visions of success, their access to support, and in what ways support for them can influence the success of garden-based learning. The results of this research are intended to illuminate existing support systems available to garden-based educators, and to gather experiences and visions from educators wishing to dig deeper and improve GBL teacher training to meet their various and serious challenges.

1.4. Research Questions

My initial question at the outset of this research was to determine how support for educators can influence the success of GBL. Within this question, there arose another, that is, what does success look like for educators? The research then evolved to probe the perspectives

of educators, and from this the research project settled on these two interrelated research questions:

1. How to define success in GBL?
2. How can support for educators influence the success of GBL?

1.5. Study Significance

As will be discussed throughout the literature review, GBL initiatives serve as an evidence-based public health intervention to increase physical activity, mental health and nutrition. GBL can also help to raise awareness and participation in environmental stewardship including climate change education, improving our shared ecosystems for the benefit and continuance of diverse life forms. Finally, as a backstop to food scares and shortages resulting from global economic and political disruptions, pandemics and climate change, GBL can help to prepare individuals and communities to achieve food security ensuring human survival.

It is evident through this research and the literature, that there are as many GBL goals as there are ways of measuring them. Defining GBL success depends on the values and mission of an individual or organization, and effective support must be catered to these specifics. In some cases, the goals of students, teachers, parents, administrators and community members can vary wildly, potentially being a source of perceived conflict and failure. The information gathered through educators' experiences could help to strengthen existing recommendations for GBL sustainability (Huelskamp, 2018) and build upon existing GBL planning and evaluative latticeworks that accounts for diverse primary and secondary objectives (Burt et. al., 2014, 2017, 2018, 2019; Diaz et. al., 2018). Through this research we can make recommendations towards the implementation of an educational farm at Lakehead University, to model best practices in GBL. If food literacy education through gardening is to be a mandatory component of the

Ontario curriculum, accompanied by the professional development for teachers to prepare them for this new requirement, we must develop a toolset whereby success can be broadly defined and measured in order to professionalise and improve support for educators.

With the notable exception of Ostertag (2015) there has been limited research conducted in Ontario and across Canada focusing on the experience of garden-based educators and how to effectively support them in developing a critical garden pedagogy. Despite this limitation there is a growing body of literature that will be explored that speaks to the ways in which GBL may purposefully or inadvertently reinforce dominant worldviews and unjust social hierarchies. This research presents a more comprehensive picture of the available and envisioned support systems for teachers wishing to, or required to, introduce critical GBL programs into their practice. Besides fulfilling a legislated mandate, the increasing interest in GBL across society suggests that the role and scope of garden-based educators will continue to grow in popularity and significance.

Through the creation of a more confident and competent teaching force, GBL initiatives can more readily achieve the intended benefits for students and society (Blair, 2009). Research on GBL consistently supports its proponents' claim that it can positively influence students' understanding of and ability to address complex, interrelated challenges. However, limitations in the longevity, scale and scope of GBL projects, can prevent them from achieving the dramatic and transformative results they seek (Blair, 2009; Ohly et al., 2016). To improve the yields of GBL to inspire transformations sought, educators, as key actors within GBL initiatives, must be effectively trellised like plants in a garden, and a new crop of garden-based educators successively sown and cultivated to extend the season. The project aims to identify any gaps or limits to GBL, especially those associated with equity. Finally, this research will dig deep and

explore the motivations, experiences, and perspectives of garden-based educators to develop a better understanding of who these educators are, what success looks like to them - and how to better support them in achieving that success.

Chapter 2: Literature Review

2.1. Introduction to literature review

As a student in the Master of Education program specializing in Social Justice Education, I have deployed a critical lens to this literature review to better understand how social inequalities and crises influence and are influenced by GBL throughout history. As a white, male, English speaking, settler identified Canadian, I have dug up and screened the phenomenon of GBL from my unique perspective as a Euro-Canadian. I acknowledge however that there exists GBL history beyond a Eurocentric frame, and ancient Indigenous agricultural teachings and understandings, although, to meaningfully consider these teachings and stories would require time, relationships and standing that goes beyond this thesis. However, due to the growing role of Indigenous initiatives in the Canadian educational ecosystem, it is important to acknowledge Indigenous pedagogies that are worthy of deeper reflection and attention. Noted especially here is the role of Indigenous learning gardens, including “Three Sisters Gardens” and “Medicine Gardens” which are increasingly popular in the context of Truth and Reconciliation (Matys, 2015; The University of British Columbia. n.d.), driven in part by advocates of decolonization calling for the return of Land to Indigenous stewardship (Tuck & Yang, 2012; Manuel, 2017). Further attention towards Indigenous understandings of this issue of GBL is especially important given the prominent role that European agricultural education plays throughout the colonization of this country and the moral imperative to learn from and remedy injustices.

This review appreciates previously conducted historical reviews on the topic of school gardens (Burt, 2016; Foxcroft, 2017; Green, 2003; Harrison-Vickars, 2014; Hayden-Smith, 2006; Ostertag, 2015; Subramaniam, 2002; Trelstad, 1997). Additionally, the review covers concepts such as place-based, experiential education, ecopedagogy, agroecology and public

pedagogy and how these frames have influenced contemporary GBL philosophies and their practical underpinnings, as well as attempts to establish approaches and tools for measuring the success of GBL initiatives. Finally, I will note the well documented benefits and barriers to GBL and explore the role of educators and support available to them.

2.2. History of GBL

The story of the development of a scheme of teaching Agriculture in the elementary schools of Ontario is a long and interesting one. All the story cannot be told here. The sketching of a few outstanding features will show, however, the relationships between the past and the present and how our educational history in this matter is repeating itself.

S.B. McCready (McCready, 1915),
Director of Elementary Agricultural Education,
Department of Education, Toronto

The deeper I dug into the history of GBL the more I began seeing wave upon wave of people and movements emerging passionately proclaiming GBL as a progressive and timeless human affair. For its greatest proponents GBL serves as an answer to the question of how to best educate children to respond to the challenges of the day. I found it interesting that someone who is so passionate and dedicated to this pursuit as I am, was so ignorant to its origins and complicated histories. In my experience most teachers I've spoken with are unaware of the prominent and recurring role of gardens throughout the history of education, and by extension, the history of our societies. Here in so-called Canada, and more specifically Ontario, there is more GBL or agricultural educational history to be unearthed in the various editions of the Nature-Study Review (Minton, 1980), the first textbooks on agricultural education in Ontario (Ryerson, 1870), and annual reports of government agencies including the Horticultural Societies of Ontario (Potts, 1914), the Department of Indian Affairs (Canada Department of Indian Affairs, 1918), Ontario Department of Agriculture and Food (1915), and the Ontario Agricultural College (O.A.C.) Review (McCready, 1915). Reviewing seminal texts like *Children's Gardens for*

Pleasure, Health and Education (Parsons, 1910) it is evident that many of the same concerns from the turn of the last century which drove interest in school gardens then, are with us today. Specifically, the increasing costs of living, health including mental, physical and the spread of infectious diseases, issues of urbanization and economic instability, the rise of nature-study or environmental education, questions of morality and the most effective form of education for the whole child (Parsons, 1910).

Ostertag (2015) was the first to introduce me to, and complicate gardens' etymological origins stating that "the English word for garden is related to the word for enclosure" (p.3). This complication will be discussed below as we tend towards a critical garden pedagogy. The learning garden then within this traditional conceptual framework aims to cultivate plants and people within an enclosed, and typically outdoor space. As a deliberate educational approach, GBL tends to be focused on formal school settings from daycares to post-secondary institutions, but it is increasingly popular in informal settings such as community and home-based gardens (Agri-Food Analytics Lab, 2020).

Gardens, for as long as they have existed, have served as sites of learning. As early as 300 BC in Epicurus' Garden School (Ostertag, 2015) philosophers and educators have deliberately utilized the garden as both classroom and teacher. According to Ostertag (2015) GBL as it's practiced in schools today is deeply rooted in the Eurocentric classical education philosophies of Comenius, Rousseau, Pestalozzi, Dewey, and Montessori.

Harrison-Vickars (2014, pp. 15-18) along with Subramaniam (2002) discuss school gardens formal pedagogical history from the Middle Ages to the present day, especially the structured union of schools and gardens in Europe and North America inspired by the works of educational theorists like Comenius, Dewey, Montessori, and Fröbel. As early as the 17th

century, Comenius called for a garden in every school (Subramaniam, 2002) a call repeated by Schwab (1879) in *The School Garden: Being a practical contribution to the subject of education* and reflected today as a stated policy goal of many governments from California (Hazzard et. al., 2012) to Cuba (Bucher, 2017). Fröbel is credited with the creation of the pre-school learning centre known as kindergarten - translated from German to mean child's garden or a garden of children (Harrison-Vickars, 2014, p. 15). Like his predecessors and contemporaries, Fröbel believed that children learn best through experiential, self-guided inquiry and hands-on play in a natural garden (Harrison-Vickars, 2014, p. 15). Kindergartens are now joined to practically every elementary school yet mostly are ironically divorced from actual gardens. In Canada, it was the intention of Egerton Ryerson (1870), the Chief Superintendent of Education for Upper Canada in 1844, that agriculture be taught in every school. To this end, an elaborate garden was established at the first normal school in Toronto to teach teachers how to instruct for agricultural education in 1847 (McCready, 1915). Ryerson, who has posthumously become an increasingly controversial figure, and whose statue at the formerly named Ryerson University was recently decapitated and removed, is also noted as an early proponent of universal public education – including that of Indigenous children through the Industrial and later Residential School systems. In the mid-late 19th century Ontario, some of the first textbooks for the newly formed normal schools in Ontario were written to support teachers in providing agricultural education to emerging normal schools for settler children, which at the time was a core subject (Ryerson, 1870; McCready, 1915; Spencer, 1916).

The philanthropic educational Robertson-McDonald movement at the turn of the 20th century is credited with helping to infuse the school garden movement in the five eastern Canadian provinces (Green, 2003). This work was picked up by governments, notably in Ontario

through the hiring of S.B. McCready (1915) who served as the first Director of Elementary Agricultural Education. McCready (1915) was in charge of special agricultural teacher training programs which included special courses and monetary grants for school gardens and their teachers who completed the training, established gardens and fulfilled the annual reporting requirements. Spencer (1916) provides us with a thorough overview of the school garden movement in each province across Canada. Around this time, south of the border in response to the existential crisis posed during WWI, the War Department established the United States School Garden Army (Hayden-Smith, 2006) enlisting over one and a half million children, fifty thousand teachers in the cultivation of over sixty thousand acres. Though the popularity of school and community gardens waned following WWII, community gardens began its more recent resurgence in the 1970s, and school gardening picked up again in the 1990s (Gardner Burt, 2016).

2.3. Situating “Critical Garden Pedagogy”

Critical pedagogy, as articulated by Freire (1970), helps teachers and students to critique and overcome structures of power and oppression within their lives. Educators do not always acknowledge and work from the position that society is stratified unjustly “...along social group lines that include race, class, gender, sexuality, and ability” (Sensoy & DiAngelo, 2017, p.20). Gruenewald (2003) invites critical pedagogues to notice and respond to how structures of power are embedded and reinforced within our relationships to place and how critical place-based education can uproot and supplant these structures. Ostertag offers us perhaps the most recent and critical history of GBL in Canada, by detailing how garden-based learning has been utilized by those in power to reinforce structures of power in society (2015, p 52).

Ostertag (2015), as a German-Canadian, takes particular interest in the ways in which school gardens have been utilized to advance patriarchal, nationalistic, colonial and genocidal programs notably in Nazi Germany and Canada. One of Nazi Germany's most popular slogans *Blut und boden* (Blood and Soil) romanticized and celebrated the German peasantry. The Nazis utilized school gardens to embolden youth with the belief in the superiority of the German race and the importance of controlling the land, to justify its violent territorial expansion and genocidal campaigns against Jewish people and other threats to racial and social purity. (Ostertag, 2015).

In Canada, it is widely accepted that the church-run and state sponsored "Indian Residential Schools" (along with Day and Industrial Schools) were intended to assimilate Indigenous children as part of a cultural genocide (Truth and Reconciliation Commission of Canada, 2015). It was within these schools that Ryerson and his contemporaries asserted that Indigenous children could learn how to be like white Europeans, in particular more like settler-farmers (Truth and Reconciliation Commission of Canada, 2015) and where food, more broadly, was used as a weapon of colonization (Owen, 2015) and genocide (Daschuk, 2013). While there, children were forced to labour on school gardens and farms, causing them to run away fleeing (Levy-Mclaughlin, n.d). Meanwhile the children experienced malnourishment and the produce was often sold to the benefit of the state (Levy-Mclaughlin, n.d). Many children died as a result of their mistreatment in Residential Schools and mass, unmarked graves continue to be unearthed. Gardens were grown locally and Waite (1915) in the O.A.C. Review documents her experience as a teacher at the Rama Day School setting up and running a school garden, representing one of the earliest written details of school gardening in my region besides that noted on Chief Island in the 1840s (Town, 2016). To this day, Indigenous children and

communities in Canada remain among the most food insecure while food is central to Indigenous sovereignty, wellbeing and lifeways and its reclamation helps drive contemporary Indigenous movements (Settee & Shukla, 2020).

More widespread research and understanding is needed and forthcoming on the role that gardens and farms played in Residential and Day Schools, how these gardens were perceived by survivors and families, and what role gardens and farms may play in healing moving forward (Toronto Metropolitan University, n.d.).

A critical garden pedagogy is one that recognizes the garden as a place in which the dominant and oppressive ideas of a society can be planted in the minds of children and takes care to cultivate an awareness that these structures are not natural, inevitable, or immutable. Cairns (2018) challenges educators to think critically and consider "...children's different relationships to food, land, and farming given their positioning vis-à-vis histories of slavery or colonization" (p.522), and how these relationships contextualize their learning within gardens. For Ostertag (2015) a critical look at the history of gardens is necessary:

to bring needed complexity and criticality to our understanding of contemporary school gardens and, in bringing this oftentimes difficult past into our obscure relationship with the present, compel garden-based educators to explore and enact our responsibilities in response to social and ecological traumas and their ongoing impacts. (p.51)

McClintock (2018) has detailed how urban agriculture initiatives, while positioning themselves as sustainable and socially virtuous may contribute to ecogentrification, disproportionately benefiting privileged white middle class participants while pushing racialized and lower-income residents further to the margins. Too often in the food movement our organizational boards, staff, meetings and subsequent programs are composed almost exclusively of white settler-identifying people despite a growing awareness that Black, Indigenous and People of Colour (BIPOC) are most impacted by food injustice (Dhunna & Tarasuk, 2021).

Authors like Guthman (2008) and Tarasuk (2001) have identified how these often voluntary, ad hoc, and non profit spaces within the food movement are created and curated by wealthier and whiter people. Furthermore, these programs often exist for the explicit purpose of helping racialized and or low income people overcome some perceived individualized deficit, like a lack of food skills, ignoring or denying the causes of this structural inequality and subsequent deprivation (Guthman, 2008; Tarasuk, 2001). Separate from and in response to these white interventions, Black farmer-educators like Penniman (2018) and White (2018) have articulated why and how food justice and liberation can and ought to take place in ways that address the systemic root causes of social inequalities through interventions that centre BIPOC leadership, and cultivate power through mutual aid, culture, and community.

The literature below argues that GBL lends itself to other pedagogies including place-based, experiential, hands-on, sustainability and climate change education, public pedagogy, critical ecopedagogy, and Indigenous pedagogy. Through these distinct and interrelated approaches to GBL, educators can cultivate their learning environments to meet the diverse needs of their students and the broader community. Kelly and Nash (2021) note through a systematic scoping review of food literacy interventions in elementary schools that while all interventions focused on functional food literacy and over three quarters attended to interactive food literacy, just over one quarter engaged in critical food literacy, such as what we've discussed here.

Growing beyond a critical garden program, agroecologists deploy a methodology that "...inflects a critical pedagogy framework with a land-based decolonial politics, emphasizing the capacity of traditional peasant production and agrarian ways of knowing to address emergent environmental, social, and political problems" (Moore, 2017, p.253). Moore's (2017) critical

pedagogical framework discussion and analysis is especially useful for supporting educators working in and with historically and presently marginalized and oppressed communities, like Indigenous students, whose lives and futures are threatened by colonial educational systems. GBL initiatives can support a movement to promote agroecology (Ferguson et al., 2019; Isaac et al., 2018; Laforge and Levkoe, 2018) by integrating and normalizing agroecological values, principles and practices among a general population where such exposure is often limited.

Ultimately, it is important to integrate a critical perspective to support educators in acknowledging the broader historical and ethical considerations embedded within school gardens and to adopt critical garden pedagogies that can lead to deeper learning for all students, empowering them to confront persisting injustices beyond the school garden to affect greater and longer lasting change. Fundamentally, it is essential for all actors seeking to foster social justice to listen closely to and empower those experiencing the injustice by addressing root causes in policy and ensuring their representation in leadership and decision making.

2.3.1. GBL as Hands-on, Experiential, and Place Based Education

Garden based learning is seeped in what Greenwood (2011) calls place-conscious thought and experience, which seeks to positively transform students' learning environments. According to Greenwood (2011)

The real challenge to education posed by place-conscious thought and experience is to question the relationship between schooling and the quality of places that all life forms inhabit. Schools, I argue, should be involved in improving the quality of these places, and when they are not, when they are outright ignoring places, they are failing to educate for worthwhile purpose.

GBL can be described in many ways including as a form of hands-on, experiential, and place-based pedagogy. I have heard these terms used together, interchangeably, or in complement, as they relate to GBL, despite their unique theoretical underpinnings and implications.

GBL can be considered a hands-on (Fifolt et al., 2018), constructivist approach to learning (Klemmer et al., 2005, p.452) in which students construct knowledge through their gardening experiences. Monaghan et al. (2017), reflecting on John Dewey's (1938) experiential learning theory, and Kolb's (1984) more recent contributions, make the case that "students learn best when they are active and engaged in topics relevant to their personal interests and goals" (2017). It may seem obvious that students learn more by doing something, rather than by simply reading about it. However, the theory of experiential learning is more than just learning by doing. As laid out by Kolb, experiential learning theory involves four distinct processes: concrete experience (CE), reflective observation, abstract conceptualization, and active experimentation (Monaghan et al, 2017, Kolb, 1984, p.30). According to Monaghan (2017), pedagogical approaches that rely on the mere hands-on experience of an activity may "lead to an overemphasis on CE and a failure to provide students with the complete set of learning experiences required to construct meaningful mental models of what they learn in the lab or field setting and encourage higher cognitive thinking" (p.751).

Green (2007) argues that food gardens help to develop a "sense of place that involves an attachment, a belonging and commitment to the garden" (2007, p.6). Sobel (2004) documented through the ground-breaking Standards for Excellence in Educational Research (SEER) Report how place-based education that engages service learning outside of the physical and metaphorical walls of the classroom, such as within a school garden, can improve a host of scores related to school achievement.

2.3.2. Climate Change Education & Food

Climate Change Education (CCE) aims to teach students about the causes and impacts of anthropocentric climate change and ways to mitigate and adapt to the imminent and existential

threats it poses (Stevenson et al., 2017). Food systems as a whole are claimed to account for approximately one third of global anthropogenic greenhouse gas emissions, and agriculture/land use account for 71% of that (Crippa et al., 2021). Given the significant and intimate relationship between food production and climate change, and devastating climate impacts on agriculture and food security, there is a growing body of research that documents the potential of learning gardens as tools for climate change education (Armstrong et al., 2018; Sellman & Bogner, 2013). However, this intersection of food, gardens and climate remains a relatively underexplored component of CCE (Corrochano et al., 2022.). Meanwhile, a majority of educators surveyed in Canada report feeling unprepared to teach climate change (Field, Schwartzberg & Berger, 2019), let alone teach climate change education through GBL. This gap represents a significant opportunity to support teachers to round out their approaches to CCE through a comprehensive program to promote climate justice and sustainable food systems (Lee, 2010).

2.3.4. Public Pedagogy

To contextualize the re-emergence of GBL during the late twentieth and early twenty-first-century, community gardens can be situated within a broader food movement which seeks transformations across food systems and society to meet pressing local and global challenges (Datta, 2016; Finley, 2013). Walter (2013) highlights the public pedagogical place occupied by community gardens for the food movement, especially valuable for adult learners in non-school settings. Finley (2013) demonstrates through his popular Ted Talk how a small boulevard garden in South Central L.A. can serve as a site of public pedagogy, where everyone is invited to learn and engage in a new and just food system. Datta (2016) explains the role of community gardens as both formal and informal sites of cultural learning and exchange between diverse people and non-human beings. Public pedagogy according to Walter (2013) encompasses all the types and

sites of learning that take place outside of formal educational institutions, including popular culture, libraries, museums, galleries, social activism and community gardens. Walter (2013, p.522) suggests that adult learning within social movements can be categorized into four streams: informal, self-directed, incidental and non-formal. Where much of the literature on GBL focuses on school gardens that occur in conjunction with formal education, critical learning opportunities abound for all participants whether they be students or community members. Using a public pedagogical lens enables a clearer view of all the ways in which community and school gardens, as much as they involve the community, exist outside of formal educational structures and can be seen as valuable sites of GBL.

2.3.6. Ecopedagogy

Writers like Kahn (2010) have watered the seeds of critical pedagogy sown by Freire and Illich, developing a potential resolution through ecopedagogy to the perennial domination of humans over one another, and humans over nature and other life forms. Not only critical of oppressive social hierarchies, ecopedagogy is a diffuse response to the existential ecological crisis (Kahn, 2010). Ecopedagogues integrate social and ecological justice education, decentering humanity through a biocentric worldview, recognizing the inherent value and worth of all living beings towards an interspecies harmony (Kahn, 2010). Kahn positions the “TEK” or Traditional Ecological Knowledge of Indigenous Peoples as a “real science for planetary citizenship and sustainability” (2010, p.107). TEK is foundational to agroecology described by quantum physicist and Earth Democrat, Vandana Shiva (1993). Shiva (1993) is critical of agricultural, social and mental monocultures advanced through western science, capitalism and colonialism to the exclusion and extinction of bio-cultural diversity, which she claims is necessary for life, health and wealth. Ecopedagogy on the other hand is diverse and evolving

(Kahn, 2010) and is an emergent concept taking numerous forms (Nakagawa, 2017; Norat, Herrería, & Rodríguez, 2016) including, towards an ecophilia or “love of nature” (Hung, 2017, p.45).

2.3.7. Indigenous Pedagogy

The First Nations Holistic Lifelong Learning Model (Stroink et al., 2010) offers that the purpose of learning, in short, is “to develop the skills and wisdom that will ensure the sustainability of life” (p.24). Through the design and implementation of an Indigenous health promoting learning garden in partnership with two Anishnawbe First Nations in northwestern Ontario, Ginoogaming and Aroland, Stroink et al. (2010) detail an alternative conception of gardening beyond tending to a bounded, enclosed space. Specifically, gardening is conceived as

the sustainable tending of any environment, forest, backyard, or community field, to produce indigenous healthy foods. As such, learning in the Learning Garden is viewed through the lens of the cyclical, interconnected, life-and health-sustaining garden, and is therefore profoundly placebased, experiential, and holistic. (Stroink et al., 2010, p.24).

Indigenous pedagogies envision the Land as teacher and call for decolonization and a deep respect and reciprocity towards all of creation (Simpson, 2014). “Aki” (Simpson, 2014, p.7) means the Land in Anishinaabemowin and is the primary source of education and intelligence for Indigenous peoples. Gardens, or Gitigaan in Anishinaabemowin (meaning “Spotted Earth” (Paradigm Pictures, 2019)), play the role of teacher in William Kingfisher’s curation of *enawendewin/relationships*, acting as entities with whom we may communicate and learn from (Artspace, 2019). Those who inhabit the garden are also teachers and students, like spiders who teach us to spin threads, life lessons and stories (Ostertag, 2018), and plants, who according to Kimmerer (2013) “...teach in a universal language: food” (p.129). Wiseman (2018) and White (2018) challenge the dominant colonial view that seeds are inanimate commodities by acknowledging them as teachers and relatives whom we share sacred duties and reciprocal

relationships central to Indigenous learning and lifeways. According to Shiva (1993) “The diverse seeds now being pushed to extinction carry within them seeds of other ways of thinking about nature, and other ways of producing for our needs” (p.6). An Indigenous pedagogical lens invites us to see the Earth itself and every inhabitant as both teacher and student, resisting oppressive, top-down and monocultural education in favour of life affirming alternatives (Simpson, 2014) that together promote *mino-bimaadiziwin* or the good life for Anishinaabe and other Indigenous peoples (Klein, 2013; Landry et al., 2019).

A number of Indigenous-led gardens are being planted at post-secondary and other educational institutions, including Lakehead University (Matys, 2015), often taking the form of medicinal gardens that promote traditional plant medicines (The University of British Columbia, n.d.) among other teachings. Gardening has been demonstrated to be an effective holistic health intervention for Indigenous peoples and children (Johnson-Jennings et al., 2020; Stroink et al. 2010). The organization First Nations Child and Family Caring Society (2020) have launched the campaign *Honouring Memories, Planting Dreams* encouraging children to plant “heart gardens” to honour survivors and those lost to Residential Schools, with the hope of advancing the calls to action of the Truth and Reconciliation Commission.

2.4. Measuring Success

How success is conceived and measured in GBL is largely taken for granted in the literature, as researchers consider success largely as measurable outcomes in individual student achievement (Cairns, 2018). Cairns challenges this mainstream measure of success as a neoliberal encroachment into the alternative food movement (2018). Neoliberalism in this case is understood as a hegemonic ideology and political-economic system that seeks to undo state regulation in the economy and society in favour of free market exchange for all goods and

services (Hayes-Conroy, 2010). Cairns offers an alternative analysis based on social reproduction feminism that considers student empowerment through identity formation, relationships, and broader socio-cultural, ecological and political impacts as the more significant and long-lasting benefits of such interventions (2018). This tendency to measure individual and ignore systemic outcomes is typical not only in education but also agriculture (Shiva, 1993), as is the case in other spheres dominated by neoliberal monoculturalism. According to Cairns (2018), “the lens of social reproduction feminism does not limit our analysis to measurable outcomes, such as more nutritious choices or higher test scores” (p. 533). Ultimately, Cairns (2018) is concerned not just with how garden-based learning affects students as individuals, but how garden-based learners reproduce the world around them through their life’s work beyond the garden.

Tools to measure the success of school gardens have been developed by Burt et al. (2014) and Diaz et al. (2018). Through a comprehensive study of the various components of school garden initiatives, Burt et al. (2014; 2017; 2018; 2019) have developed what they call the Garden Resources, Education, and Environment Nexus [GREEN] Tool. As a means to measure the successful integration of school garden programs, the GREEN Tool (Burt et al., 2017) outlines through a visual map 19 different components, how they are related, and when to implement them, along with a scorecard to assess the success of each component and overall integration of the GBL program. Diaz et al. (2018) through a Delphi study involving 74 GBL-adjacent practitioners in Florida, distilled 38 key measurable outcomes that can be used for the evaluation of school gardens. Outcomes were selected in a three-round process by consensus (two-thirds) from a larger list of 77, ranging from immediate, intermediate, and long term (Diaz et al. 2018).

2.5. Benefits of GBL

According to R.B. Whyte, a supporter of the Horticultural Societies of Ontario and its school garden programs during the 1910s “It is impossible to overrate the benefit of school gardens” (Taylor, 1914, p.51). Without a transfer and advancement of resilient food systems knowledge from one generation to another, and productive spaces in which to practice such knowledge (Barthel et al., 2013), human populations have and could continue to experience deadly food insecurity in the event of crisis events that disrupt existing food supply lines. On a macro-level, for agricultural societies, past and present, survival is a fundamental benefit of GBL in its various forms. This is especially well documented in times of existential or compounding crisis events, evident in the rise of the United States School Garden Army in WWI among other wartime gardening initiatives (Hayden-Smith, 2006) and throughout the modern history of school gardens (Burt, 2016). In addition to the reproduction of agrarian societies, diverse and interrelated individual, social and ecological benefits are well defined in the literature (Blair, 2009; Farm to Cafeteria Canada, 2018; Ohly et al., 2016). Understanding the full range of benefits of GBL is essential to supporting educators to determine their teaching goals and subsequent pedagogical approaches. The following section is a breakdown of several categories of benefits cited in the literature.

2.5.1. Civics, Inclusion, & Social Justice

Discussing the objectives of the school garden, Joyce says that the “final goal is that of all education — the making of a good citizen” (1915, p 363). The most fervent supporters and evangelists of school gardens and GBL are those who believe that its goal is to cultivate children into happy, healthy, intelligent, curious, capable and caring adults, in essence, what they perceive to be model citizens necessary for building a prosperous nation (McCallum, 2015; Parsons, 1910). As noted through the history of GBL, who and what constitutes a model citizen is not uncontested. The ideal is often determined by groups in power - the imposition of these norms

can generate negative outcomes for those experiencing social injustice (Sensoy and DiAngelo, 2017). The ability to teach civics and democracy is not lost on modern scholars like Levkoe (2006) and Walter (2013) who make the case that urban agriculture used as public pedagogy can facilitate all ages learning on critical topics ranging from regenerative agriculture, social justice to grassroots participatory democracy or food democracy (Hassanein, 2008). Looking at more formal educational institutions like pre-schools, Casey et al. (2018) detail how through self-guided inquiry, gardens can serve as fertile grounds of democratic citizenship and social studies education for children as young as three and four years old. Wolsey and Lapp (2014) speak to the connection between school gardening and Global Citizenship education, an expansive notion of citizenship that can go beyond borders and help students to consider issues such as human rights including the right to food (De Schutter, 2012) as part of a new food citizenship (MacRae and Welsh, 1998).

Dyment and Bell (2008) argue for the potential of GBL initiatives to promote social inclusion with respect to race, class, gender and ability. GBL has been demonstrated to promote school connectedness and transformative benefits for marginalised students like those engaged in the Jones Valley Teaching Farm in Birmingham, Alabama (Fifolt et. al, 2018) or the high school dropouts who through the re-creation of a traditional Native American Yaqui garden, found restorative healing for themselves (Sandler et al., 1995). Similarly, the Farm School NYC was founded to “train New York City residents in UA in order to build self-reliant communities and inspire positive local action around food access and social, economic, and racial justice issues” (Reynolds, 2017). Guerrero (2017) provides a relatively comprehensive resource guide for inclusion in school gardens especially for learners with diverse physical and cognitive abilities. Case studies like these demonstrate how life-saving lessons that combine environmental and

social justice can be successfully learned through GBL for all ages in formal and informal settings.

2.5.2. Health

Creating healthy schools is at the forefront of growing interest in GBL (Community Garden Council of Waterloo Region, 2016). Health through nutrition, in particular, is cited as a primary benefit and driver of the latest wave of GBL by proponents including teachers, parents, community members and public health workers (Harrison-Vickars, 2014; Huelskamp, 2018). Ohly et al., (2016) document various health benefits of GBL, and the factors that help or hinder their success in a systematic literature review. Such benefits include physical health stemming from exercise (Wells et al., 2014), diet and healthy eating habits, (Graham et al., 2004; Hebert et al., 2014; Wright & Rowell, 2010), mental health (Hall & Knuth, 2019) and wellbeing (Malberg Dyg & Wistoft, 2018) related to what Williams (2015) calls regenerative hope, a unique brand of hope cultivated through agency and action inspired in learning gardens. A lack of curriculum integration and external support may limit benefits (Ohly et al., 2016).

Horticultural therapy (Bruce, 2013), worth noting, is a unique approach that aims to improve mental health through the practice of horticulture. Ohly et al. (2016) in their review determined that while most of the quantitative research suggested modest health benefits, their conclusions were weakened by methodological limitations, especially the size and duration of the interventions. Where the qualitative studies suggest even more significant health benefits, these conclusions again were generally unsupported by the quantitative evidence (Ohly et al. 2016). Notably, Ohly et al. (2016) suggest that the greatest health benefits are available to students with unique educational needs, including lower income, racially diverse or otherwise marginalized students (Greer, 2019; Ruiz-Gallardo, 2013) and who are not served well by traditional classroom instruction.

2.5.3. Academics

Where GBL takes place within formal educational settings like schools, educators need to understand and demonstrate the academic value of GBL (Graham et al., 2005) as a key element of success, especially in the eyes of administrators. According to Harrison-Vickars (2014) “A fairly well-rounded evidence base has been established in regards to academic achievement supported by GBL” (p.19) a sentiment confirmed through a systematic review of research into the academic benefits of GBL (Williams and Dixon, 2013). Much has been said about the benefits of GBL towards science education (Williams and Dixon, 2013) and science teachers’ strategies (Cross & Khan, 2018), where it has been shown to result in the greatest benefits (Williams & Dixon, 2013). While less has been said about other subjects like math, literacy, and arts, the garden provides ample opportunity to integrate curriculum expectations from any subject matter.

2.5.3.1 - Science

Naturally, science is another major area of interest for GBL. Rye et al., (2012) make a strong case and offer resources for the integration of GBL and science instruction for all grade levels. Rahm and Grimes (2005) detail a unique youth gardening initiative that merges entrepreneurship and science education in a way that embeds the learning within the everyday activities of the program. This embedded learning is a common thread running through GBL, offering opportunities to learn by experimenting, inspiring the idea that gardens are not just classrooms but laboratories (Burns and Miller, 2012; Life Lab, n.d.). In support of scientific achievement, according to Harrison-Vickars (2014) “Blair (2009) conducted a meta-analysis and found 9 of 12 studies revealed a positive difference in test measures between gardening and non-gardening students. School gardening increased the science scores in all reported studies (Blair 2009)”

(p.19). Lebo and Eames (2015) share how educators can utilize a permaculture approach, especially through interactive field trips, to make science education more relevant and engaging for students.

Outside of schools, botanical gardens are a popular place in which science education occurs (Zhai and Dillon, 2014). Zhai and Dillon (2014) critically examine the pedagogical approaches of botanic garden educators who in their survey typically deployed a non-interactive and authoritative approach to science communication. Zhai and Dillon (2014) recommended a more educator-student dialogic approach involving more open-ended questions and opportunities for students to meaningfully engage in the learning process, rather than simply being told what to learn, an approach common under the banking model of education described by Freire (1970).

Science and technology frequently appear together, and the garden provides many opportunities to develop and deploy technologies. Jon Schneller et al., (2015) document the role of technology in the creation of an indoor hydroponic and aquaponic garden initiative and how the use of technology can engage students' diverse interests, but also expand the potential for GBL for learners in northern communities or other places limited by space and climate.

2.5.3.2 - Math

The design and layout aspects of gardens in particular provide opportunities for understanding concepts related to measurement (Selmer, 2016), but countless questions may arise that advance diverse math objectives (Ürey et al., 2013). My friend, fellow community gardener and colleague at Lakehead Orillia, Linda Grant (Grant, 2017) has described in depth her case study that contextualized math education for First Nations students in a school garden. Grant states, “garden-based learning contextualizes mathematics in real-world examples, which gives students concrete activities within which they can use their mathematics skills” (2018, p.34). As a core

subject area in school curriculums, integrating math and GBL is an important approach given the tendency of school boards to measure student success based on academic achievement in core subject areas like math and literacy. For this Indigenous community, in particular, Grant documented the rich and varied learning opportunities enabled through outdoor, culturally responsive and holistic mathematical inquiry contextualized in a school garden (Grant, 2018).

2.5.3.3 - Literacy and Other Subjects

Whether through verbal or written instruction, reading seed packets, daily journaling of one's gardening experience (Parsons, 1910), literacy instruction can happen both explicitly and incidentally throughout school gardens (Pascoe & Wyatt-Smith, 2013). Furthermore, according to Green, “garden-based learning should not be viewed as an adjunct to the primary curriculum but rather as an interdisciplinary portal through which places and subjects can be explored and woven together” (2008, p. 15). The diversity of types of learning gardens and the activities that they encourage provide opportunities for ambitious educators to integrate all curricular subjects including literacy (Pascoe & Wyatt-Smith, 2013), ecoliteracy (Gaylie, 2008), food literacy (Kelly and Nash, 2021), agricultural literacy (Desmond et al., 2004), arts (Inwood, 2006), special education (Rye et al., 2012) and more (Williams and Dixon, 2013).

2.6. Barriers to Garden-Based Learning

GBL has recurring challenges that contribute to their failure and discontinuation (McCready, 1915). For starters, in our cold northern climate, one of the first hesitations I hear from educators is what happens to and who looks after the garden during summer vacation, or after the teacher who started it moves on. McCready discusses in an O.A.C. Review article titled *Care of school gardens during summer vacation* (1915) that summer care ought to be one of the

first considerations and that planning ought to occur a year ahead and in cooperation with the broader school community among other useful suggestions. McCready also offers this warning:

It is better not to commence a garden at all in most cases, than to demonstrate only a failure. One year's failure will ordinarily be more convincing of the uselessness of school gardening as an educational enterprise than several years of successful gardening will be convincing of their usefulness. (1915, p.452)

I know McCready's prophetic warning to be valuable as the frequent discontinuation of GBL initiatives is something I have personally witnessed in the Orillia area, as have others including Harrison-Vickars (2014, p.118).

Such barriers were well understood a century ago and they are similar today (Austin, 2017; Haase, 2020, Yu, 2012). Austin (2017) confirms through their research such challenges, including garden maintenance, curriculum overload and linkages, risk management, weather & climate, resources, transitions of key personnel, vandalism, and the unique challenges experienced by new teachers. In terms of supporting educators, Austin (2017) noted a key discovery through her survey of teachers in Ireland engaged in GBL, that while challenges may arise and persist, teachers surveyed believed that "...benefits of the garden completely outweighed the challenges faced" (p.46). Stempel (2019) offers us a discussion and suggestions for overcoming unique challenges affecting lower income communities in sustaining GBL initiatives, such as best practices and resources for teachers to make efficient use of what they have available. Yu (2012) examines barriers to garden-based learning by investigating the common reasons for which they are discontinued, illuminating a gap in the research regarding the longevity and sustainability of school gardens. Yu's (2012) research has the benefit of a relatively large sample size of garden-based educators (n=1,301) including extant (n=1166) and discontinued (n=135) initiatives, albeit with the vast majority based in the USA (p.12). A detailed questionnaire allowed Yu (2012) to more confidently uncover the primary challenges

perceived by educators, which generally correspond to the existing literature and expert consensus on school garden barriers (Webb, Diaz & Campbell, 2018). Yu (2012) however distills these challenges into two essential concerns “...a lack of broad-based support and a lack of strategic planning” (p.62). Hoover et al. (2021) through a review of over 100 school gardens in the Austin area suggest that unsuccessful school gardens were far more likely to lack funding, community and student engagement, garden committees, teacher training and curriculum supports, and adequate school board and administrative support. Haase (2020) has reached similar conclusions after conducting the most recent and local investigation into the challenges and opportunities for school gardens in Ontario by gathering and discussing the experiences of ten teachers and garden facilitators.

2.7. Support for Garden-Based Educators

The major question of this thesis is to determine in what ways can support for educators influence the success of garden-based learning. To that end, I have categorized the various types of support currently available to garden-based educators. There is a growing ecosystem of support that exists to better prepare future garden-based educators and it is interesting to compare these with what has existed historically (McCready, 1915; Spencer, 1916) to help us envision what a robust and resilient system of support may look like in the future.

2.7.2. Non-profits, Partners & Community

School gardens invite many opportunities for community support and engagement from parents and families, neighbours, local businesses and non-profit organizations (Desmond et al., 2004). Harrison-Vickars of Green Thumbs Growing Kids, a neighbourhood non-profit organization in Toronto, helped launch the “Imagine a Garden in Every School” campaign (2014). This campaign is a part of a re-emerging networked food literacy movement represented

provincially by organizations like Sustain Ontario's "Ontario Edible Education Network" (Harrison-Vickars, 2014, p.71) and nationally through organizations like Farm to Cafeteria (2022), Coalition for Healthy School Food and others internationally (Desmond et al., 2004).

Farm to Cafeteria Canada's Farm to School Map (2022), is a "self-reported, real-time tool," that shows at present 589 school garden initiatives across Canada. Mapping what exists offers the ability for garden-based educators to create community and support one another. Accordingly, non-profit organizations and school-community members (parents, neighbours, local gardening groups, public health agencies, etc.) often play a critical role in supporting school gardens and garden-based educators (Harrison-Vickars, 2014). Harrison-Vickars (2014) offers a glimpse of this relationship through a comparative study between two school gardens in Toronto, one that had a community partner (Green Thumbs Growing Kids) and one that did not. Notably, Harrison-Vickars (2014) spoke of the role that the Ontario EcoSchools certification program plays in motivating, and in a way, rewarding school gardens through points towards their EcoSchools certification, even though EcoSchools doesn't offer physical resources.

Innovative approaches to GBL recognize that gardens provide us with lifelong and intergenerational bonding and learning opportunities. Bolshakova et al. (2018) position teenagers as teachers to their younger peers, providing them with a powerful learning opportunity through teaching. This type of teens as teacher program, especially in an after-school or summer break context, can help to overcome some structural barriers to GBL, especially the expectation on teachers to lead extracurricular garden learning activities and lack of funding for facilitators (Bolshakova et al., 2018).

2.7.2.2. Curriculum Links & How-to Guides.

Standardizing GBL can be challenging, given it is inherently diverse, however, there are sufficient commonalities that can inspire recommended lessons aiding curriculum integration (McCready, 1915). The local chapter of the national organization Canadian Organic Growers (Coorsh, 2017) has helped develop curriculum-linked gardening workshops they offer to schools in the Ottawa area through their Growing Up Organic program (Haase, 2020). In British Columbia, The Society Promoting Environmental Conservation (SPEC) has produced an extensive lesson book for teachers (Gordon, 2014). More recently, The Centre for Sustainable Food Systems at UBC Farm has created seven food justice modules to support educators to bring a critical food systems education into their classroom (The University of British Columbia, n.d.).

For educators seeking theoretical and practical steps on their school gardening journey and GBL, there are a growing number of how-to guides freely available on the internet which I've curated in the resources section of this thesis. My list however, pales in comparison to the list of nearly 100 food literacy resources collected by Sustain Ontario (n.d.), to engage children and youth, a majority of which revolve around gardening, soil and compost. Numerous organizations have produced guides and lesson plan resources recommending best practices and ideas for starting and running school garden and farm programs. These include for profits (Eartheasy, n.d.), industry affiliated non-profits (Nutrients For Life, 2022), community-based non profits (Gordon, 2014), public institutions such as regional health units (Durham Region Health Department, 2018), city parks (GreenThumb, 2009), conservation authorities (Toronto Region Conservation Authority, n.d.), school boards (Vancouver School Board, 2018), universities (Cornell University, n.d.) and intergovernmental organizations like the FAO (Desmond et al., 2004).

These guides range in complexity and focus, some providing regional or institutionally specific instructions - like how to start a garden within the Vancouver School Board (2018), to more comprehensive guides meant for a global audience such as that produced by the FAO (Desmond et al., 2004). Each guide carries implicit values surrounding the focus or goals of the GBL initiatives, for example, the health unit guides prioritize health and nutrition elements like that produced by the Durham Region Health Department (June, 2018) and the Community Garden Council of Waterloo Region (2016). Guerrero (2017) has made a unique guide focusing on accessibility and inclusion in school gardens for learners with diverse abilities from a Universal Design for Learning framework. The guide produced by Nutrients For Life emphasizes the importance of plant nutrients, no doubt to build public support for the products produced by the fertilizer industry which finances its educational programs (Nutrients For Life, 2022).

Some researchers, like Dymont (2004), have explored the possibilities of expanding such initiatives at the board level, in this case, within Toronto District School Board sites. Beyond traditional how-to booklets, others have narrated their experiences and identified best practices for how to start a school farm or garden project (Slotnick, 2010). Slotnick (2010), the founder and director of the PEAS farm in Missoula, Montana writes about the basic replicable tenets of a community education farm at a university with the intention of providing a primer for those looking at establishing their own community education farms. Slotnick's (2010) work and that of Sayre & Clark (2011) detail the history of the student farm movement in North America. Among other pieces of advice, Slotnick (2010) makes a salient point emphasizing the need to "hire a farmer - someone with real agricultural skills and experience - who can also teach" (p.227). In this case, Slotnick (2010) is describing a production integrated educational farm, which depends

in part on the production of food as a source of purpose, funding and sustainability. This school farm concept differs from that of a school garden in scope, but the basic premise rings true: the need to involve an actual gardener, someone with horticultural skills and experience but who can also teach (Slotnick, 2010). Harrison-Vickars (2014) also makes the distinction between school gardens and market gardens, where the latter is typically reserved for high schools or higher education and integrates food production, and entrepreneurship education. Desmond et al., (2004) along with the FAO (2009) have created popular, lengthy and detailed discussions of GBL for the beginning and experienced garden-educator, offering a global perspective, relatively unique among the academic literature on the topic. Finally, we can look to history for still informative guides towards organizing successful garden-based learning initiatives (Jarvis, 1916; Parsons, 1910; Schwabb, 1879; Spencer, 1916).

2.7.3. Formal Teacher Training

As Urban Agriculture Coordinator at the University of Toronto, I met Hilary Inwood at the Ontario Institute for Studies in Education (OISE) and helped plant garden boxes to inspire teacher candidates there to explore garden-based learning in powerful, yet small and symbolic spaces within the concrete jungle (Jagger et al. 2006). The OISE Learning Garden is just one of a growing list of examples I've compiled in the resources section, as to how Faculties of Education are integrating GBL into their formal teacher training programs, as they once did over a century ago in Ontario (Dearness, 1915). Both Zandvliet (2019) and Burns and Miller (2012) offer alternative views of how teacher training programs can integrate GBL and provide a fertile foundation for teachers as they enter the classroom. Specifically, Zandvliet (2019) offers "... a discussion of the potential for using botanical gardens for place-based forms of teacher education" (p.146) based upon an innovative environmental education field course placed in

Hawaii. Through a recollection of her coming to understand Indigenous food/scapes, and a reflection of teacher training assignments exploring “endogenous foodScapes,” Ma Rhea (2018) articulates a movement towards critical, Indigenist and Gaian eco pedagogies. Burns and Miller (2016) in particular speak of their experience at the highly acclaimed Learning Gardens Lab (LGL), a partnership between the University of Portland, University of Oregon and others. The LGL acts as a center for sustainability education, offering teacher training in GBL, numerous youth GBL programs, and as home to the Learning-Gardens Educational Assessment Group, which conducts research into the benefits of GBL (Burns and Miller, 2016).

2.7.4. Board Policy & Professional Development

Some Boards of Education in Ontario, such as the Limestone District School Board (2021) have actual school garden statements or policies, which can encourage and provide resources to educators to establish and maintain GBL initiatives like professional development opportunities offered historically (McCready, 1915; Spencer, 1916). Locally, the Simcoe County District School Board, through their seasonal professional development sessions, have made space for garden-based educators, like me, to facilitate resource sharing and professional development opportunities for teachers. Through their work and research Harrison-Vickars (2014) has solicited feedback from teachers, who expressed an interest in attending professional development workshops days on the topic of GBL, to accompany them as they grow from season to season. Presently, it is apparent that much of the professional development that is offered to teachers and other educators for GBL stems from individual enthusiasts through books, online resources, and non-profit organizations and post-secondary institutions. Some examples in the USA include REAL School Gardens (McCarty, 2013), Lifelab’s “Garden Educator Certification” (Life Lab, n.d.) and the University of Texas Nutrition Institutes teacher training program (UT

Nutrition Institute, n.d.). In Canada, organizations like Green Thumbs Growing Kids (Harrison-Vickars, 2014), Canadian Organic Growers (Coorsh, 2017), and VanDusen Botanical Garden (n.d.) in Vancouver provide more formal training opportunities to teachers, but much more can be done.

2.7.5. Informal Teacher Training

Teachers informally learn from each other through the day-to-day school experience. Teachers also learn through online and non-academic networks by accessing resources and grey literature (Harrison-Vickars, 2014). Harrison-Vickars (2014) was taken aback by learning how many teachers “...go it alone” (p.120) when it comes to having little or no community support for their GBL initiatives. This do-it-yourself attitude suggests that teachers, if motivated, are capable of acquiring the knowledge and skills to create GBL opportunities through whatever formal and informal means are available to them.

2.8. Conclusion

This literature review demonstrates the cyclical nature of GBL throughout history (McCready, 1915) and its association with social crises (Parsons, 1910). Further, we discussed the dark side of GBL (Ostertag, 2015) and its profound embeddedness within the history and practice of education throughout the last 150 years in North America (Burt, 2016) and elsewhere. Noted here were the various benefits and approaches to measuring the success of GBL, as well as a view of the current system of support for garden-based educators. Timeless texts on the subject reveal a potentially transformative educational practice that is notably adaptable to diverse places, times and goals which is concerned less with teaching how to cultivate plants, and more with cultivating children. While the literature is extensive on this topic, the research

hopes to fill a gap in our current understanding of the role of educators within GBL programs in order to support their further development and success.

Chapter 3: Methods “The Seed Model of Research”

As a seed saver, I could not ignore the similarities between collecting and analyzing research data and collecting and cleaning seeds. I approached both the literature review and the collection and analysis of this large body of information in a similar way that I approach a collection of seeds from the field. Not only are seeds coded packets of information, but for me, their collection and processing represent a similar process to that of data collection and analysis. Rarely am I able to harvest just the clean, pure seed when I am harvesting from the field. Typically, all the seeds and chaff (all the other parts of the plant) are thrown together in one large bin to be sorted at a later date, as was the case for the information collected for this research. The following describes in more detail the methodological process undertaken for this research.

3.1. Rationale for Qualitative Research Design

Qualitative research, compared to quantitative research, allowed me to effectively draw out the experiences of garden-based educators in conversations stemming from in depth semi-structured interviews. As noted by Seidman (2006), the purpose of the in depth research interviews is to draw out the lived experiences of garden-based educators and the meanings they ascribe to those experiences. The data collected through this qualitative study was primarily verbal.

3.2. Phenomenological Research & Grounded Theory

This research is primarily inspired by a phenomenological inquiry aiming to simply describe the experiences of garden-based educators (Creswell & Creswell, 2018). With a desire to go beyond merely describing the phenomenon, I’ve been further inspired by a grounded research approach that guides the researcher in developing a deeper understanding of phenomena aiming to arrive at a “general, abstract theory of a process, action or interaction grounded in the

views of the participants” (Creswell & Creswell, 2018, p.13). By assuming a grounded approach to this research, I did not want to predetermine or overly shape the participants answers by narrowly defining the research questions to fit within my pre-existing understanding on the topic. According to Creswell & Creswell, “such grounded findings emerging from the data themselves, are frequently among the most interesting and important results obtained during research, even though they may have gone unnoticed during the data-collecting phase” (2018, p.148). For example, while conducting a literature review, I uncovered what I thought were the main goals of GBL, but rather than presenting what I thought were the main goals and asking the participants which they would agree with, instead I asked them what their main goals were, which elicited unexpected results.

3.3. Descriptive Research

I have also been inspired by a descriptive research design (Stangor, 2011) in order to gather a more in depth picture of what currently exists in the way of support for garden-based educators. Descriptive research tends to precede explanatory models, given it is important to describe a phenomenon before explaining how or why it occurs. Stangor (2011) defined descriptive research as “Research designed to answer questions about the current state of affairs”, which provides “a snapshot of thoughts, feelings, or behaviors at a given place and time” (p. 14). It is my intention through this research to not only help explain the phenomenon of GBL through the perspective of educators but gather numerous examples and resources to provide a snapshot in time of current GBEs and their GBL ecosystem, findings that are offered in the Resources section of this work.

3.4. Transformative Approach

As a critical theorist working in the field of social justice education, my approach to this research project has been guided by a transformative worldview that seeks to “confront social oppression at whatever level it occurs” (Creswell & Creswell, 2018, p.9). The approach is manifested through the focus of the study, aimed at empowering both teachers and their students towards creating a more just and sustainable society in the face of intersecting crisis events. While research participants were not directly involved in the crafting of the research questions or design, through my position as a Graduate Assistant in the Faculty of Education at Lakehead University in Orillia, I was able to engage numerous teacher candidates in formulation of the research proposal. Through my participation as a garden-based educator, I am aware firsthand of the transformative potential of this work and the limitations on educators to realize it. This research emerged after years of movement organizing and is intended to document the gains made and to propose strategies for advancement towards a more equitable and sustainable future, which includes a garden at every school.

3.5. Benefits to Participants

It was evident during interviews that participants were prompted by the questions to engage in meaningful introspection. This introspection allowed them to consider their work in new ways, along with feeling encouraged to know that their work has meaning and value to the broader community. Some participants noted that through our conversation they felt more confident and knowledgeable. The final results, including recommendations of this research and this paper are intended to be shared with all the participants, their colleagues and the broader GBL community.

3.6. Benefits to Society

This thesis and key results will be presented to the community through a public event and ongoing GBL workshops, as well as be made available in its entirety for public access. The research is intended to benefit society through the improvement of professional development of educators working in the field of garden-based education, related fields, and education more broadly. The findings will also be useful for policy and program development at institutional and organizational levels including school boards, municipalities and other levels of government, and NGOs.

3.7. Interview Setting

Interviews took place throughout January and early February of 2021. At this time, for the majority of participants, their educational settings were snow covered, offering a natural time for reflection. For a couple participants on the Pacific West Coast, their climates allowed for year round outdoor activities, no doubt contributing to their more advanced programs they described. Interviews were originally intended to occur at the educators' sites where they practice GBL, but due to Covid-19, they were instead conducted through the Zoom platform, which allowed for virtual face to face interactions. In some cases, interviewees used pictures of their gardens as backgrounds for added context and to help describe their projects.

3.8. Population Selection

The target population for this research were self-identified Canadian GBEs. As an active member of the local school gardening community, I sent invitations to a number of active local garden educators along with an invitation to share with colleagues. Invitations were also sent to the Outdoor Environmental Education and Healthy Active Living Coordinator at the SCDSB and posted to the Facebook group of the Council of Outdoor Educators of Ontario. These channels yielded over a dozen interested participants, of which, eight responded to follow ups and were

subsequently selected. The first five were selected based on a first-come first serve basis, and two additional participants were selected based on recommendations from other participants, suggesting that they could offer important insights for this research. Furthermore, one participant was selected based on their demonstrated and published interest in this work.

Participants represented diverse educational contexts including roles in non-profit and public education, in both rural and urban settings across three provinces. These participants represented a balance of local representation and a diversity of geographic and professional locations. It was important for this research that participants were drawn from diverse positionalities within the GBL ecosystem, along with strong local influence, in order to produce a fuller picture of the range of experiences of garden-based educators and recommendations that would be valuable both locally and further afield. Furthermore, Seidman (2006) warns of the potential downsides of interviewing acquaintances or friends, in so far as the interviewer may compromise certain aspects of the interview, knowingly or not, in order to maintain the other ongoing relationship. Given my active role in the local GBL movement, it was important for me to ensure that a significant portion of the interviewees were people with whom I had not met or had limited or no ongoing relationships.

3.9. Research Toolshed

Prior to Covid-19, it was my intention to utilize a combination of tools to perform the research including site visits as a tool for data gathering, especially observations, pictures, and video of the sites in which the garden-based educators operated. This visual information was to help contextualize the experiences of GBE, illuminated through semi-structured interviews. In the absence of site visits, participants were asked to describe in detail their garden spaces, as well as submit images or pictures they had taken previously. Educators were also encouraged to

contribute other data relevant to their experiences including lesson plans, policies, and other sources of inspiration.

3.9.1. Semi-Structured in Depth Virtual Interviews

Semi-structured in depth virtual interviews were the sole means of data collection for this research. A semi-structured interview was selected to allow for a group of questions that would remain consistent and guide all of the interviews. However, such an approach allowed for the openness necessary to grow with the flow of the conversation, to ask probing and clarifying questions as needed.

3.9.2. Interview Structure

Before beginning the interview, participants were re-introduced to the research project and its main question, along with the interview timeline and logistics. The interview was structured in three parts. The first part aimed to gather the personal context of each educator's GBL activities, mapping their journey of becoming a GBE, in addition to laying out their current projects, students, roles and responsibilities. The second part of the interview questioned the educator's definition of GBL success, and how they may conceive of and measure it. The final part documented support for GBE, including what support they desired, and how these supports may contribute to the success of GBL as envisioned. In total, 10 broad questions and 19 sub questions were prepared and posed at each interview, however due to the semi-structured nature, unique additional questions were posed to different interviewees. All of the interviews took at least forty minutes and up to an hour and five minutes to complete.

3.10. Ethics

In preparation for this research, I applied and was granted permission from the Lakehead University Research Ethics Board to engage human research participants. The purpose of this

application was to ensure that this research was carried out in an ethical manner, specifically, treating research subjects with respect, and concerning the promotion of welfare and justice. For example, it was important that research participants were not in any way under my authority, such as B.Ed. students whom I may work, or employed by me in other capacities. To avoid more complicated ethical scenarios, I made the choice to not focus my research on or with Indigenous Peoples or organizations, despite the fact that Indigenous Peoples and Indigenous gardens are increasingly active and engaged in this space and deal directly with some of the most pressing issues. With that said, it was likely that Indigenous Peoples may be incidentally engaged as educators themselves or as members of communities engaged by educators researched for this project.

Prior to their participation, each subject was required to provide informed consent acknowledging their willingness to participate and familiarity with potential risks, of which there were few. The potential risks to participants were mainly psychological, including the potential for potentially harmful thoughts, memories and reactions provoked through potentially triggering research questions. Opportunities for healing and psychological growth were also present and both potentials were acknowledged and risks to harm were actively mitigated through consent and researcher attentiveness to the needs of participants. By anonymizing research participants, there is a further reduced risk of injury stemming from a result of potentially personal or embarrassing or otherwise socially harmful information being revealed by this research.

3.11. Data Handling Protocols

The audio for each interview was recorded through Zoom and automatically transcribed, being available for me to download through the Zoom platform. I also recorded the audio on a separate audio recorder in the event of technical failure of the primary platform. These

recordings and transcriptions were downloaded, anonymized, and stored on a secured USB and through my password protected Lakehead University google drive account. Single letter pseudonyms, capitalized, in alphabetical order (omitting “A” and “T”), were given to each participant to better protect their identity within the results chapter.

3.12. Secondary Data from SCDSB, Focus Group

At the beginning of this research, I had intended to include the use of quantitative and qualitative secondary data that was being gathered by the SCDSB for internal and external purposes. However, Covid-19 suspended the ability for the SCDSB to complete the research. The research aimed to gather details regarding the current state of school gardens across the school board, including the number of and nature of garden based learning initiatives ongoing. This secondary data if and when it becomes available would be a useful backdrop against which we can contextualize the in depth experiences of garden-based educators. Other organizations such as the Simcoe County Food Council have also expressed interest in measuring this data as a key metric against which to measure food literacy and related food security in the community (Eco-Ethnomics, 2019). I had also intended to include an in-person focus group to take place at Lakehead Orillia, providing an opportunity to cultivate a professional learning community and to showcase the learning gardens on campus. However, due to Covid-19, in person focus groups were cancelled.

3.13. Results & Analysis

My analysis began with re-listening to the recordings and correcting transcripts for errors. Upon my second review, I began “winnowing” the data (Creswell & Creswell, 2018, p.192) to separate important and less useful information, while manually coding the interviews due to the small data set. In this step I highlighted interesting ideas, quotes, references to specific names,

organizations, and recurring language as part of a *First Cycle* coding process (Saldana, 2009). During this first cycle I deployed a “live coding” technique (Parameswaran et al., 2020), where I coded while listening to the audio recordings and reading the transcript, in order to better capture the voice, tone and feelings that may have been missed if I focused solely on the written transcript. Immediately following each interview, I would write how I was feeling, what I was thinking about and my key takeaways. I began assigning codes for different groupings of information, for example, while participants were describing their own experiences growing up or learning how to garden, I assigned the code “first gardening experience”. Later during the *Second Cycle* (Saldana, 2009) original codes were further subdivided to categorize the settings and relationships in which their first gardening experience occurred, for example, at school, home, with parents, grandparents, or at work (such as on a farm, or landscaping company). Results in these categories were collected and displayed in the form of tables presented in Chapter 4. Through this second look I was able to further extrapolate patterns that gave me further insight into the motivations and experiences of garden-based educators.

From there, I collected the highlighted sections and annotations from each interview into a larger document and began grouping them based on emergent themes that corresponded to the distinct interview question themes. In addition, and after reviewing all the interviews individually, I compiled them into one large document where I could perform specific keyword searches. Curious as to how many times certain keywords were mentioned, or not mentioned, as well as by how many participants, and in what contexts, I began compiling a list of keywords based on my previous rounds of coding. An additional list of keywords was auto generated using a word cloud application, providing me with a comprehensive listing of the frequency of each word from which I could note any missing from my original list. Similar keywords grouped

together to form categories from which further meaning could be derived. I have included a full listing and notes on keywords within Chapter 4.

3.13.1. Reflexivity of Researcher

It is important to acknowledge that as a participant in the GBL movement, and as a GBE with a deep academic, professional, financial and personal interest in this subject, this relationship influenced my research approach and interpretation of the results. The information gathered and presented was therefore of personal interest and value to me as I continue to work in this sphere in a professional capacity. Most significantly, I approached this subject from the position that more needs to be done to support educators and that I, among a movement of people, am well positioned to provide that support.

In addition, my positionality as a younger, white, male, settler-identifying person operating in this field presents additional biases – such as the relative importance of this subject and my power to affect change. The participant selection and questions that I have asked are based upon these assumptions. For example, when deciding on participants to interview, I chose only existing GBEs who were easy to reach and who I assumed would likely indicate that they need more support – rather than choosing participants, like administrators for example, that may have other priorities. In hindsight I did not make any special effort to recruit participants from diverse demographics that may have presented challenges to these research assumptions. Given these assumptions and the potential for confirmation bias, I am less likely to have looked for and highlighted findings that may diminish my potential future roles or occupations in this field or arrive at a conclusion that challenges my initial understanding of the topic.

Due to this personal bias, it is fair to be critical of the validity of the findings given the strong incentive I have had to frame questions and interpret the data to confirm my assumptions

of the problem and solutions on offer. However, I believe that the experiences offered by interview subjects leave little room for misinterpretation and that the conclusions reached may be justified independently of my own personal interests.

3.14. Study Limitations

The study was limited in various ways, including by selection and researcher bias described above and below, as well as the small and geographically diverse study population, the lack of previous research into the topic, the uncritical nature of the research questions, and Covid-19 pandemic restrictions on research protocols.

Researcher bias presents limitations for this study, given my role as a garden-based educator (Creswell & Creswell, 2019). With my stated intentions of wanting to actively support other GBE, there is serious potential for bias as I personally know a few of the participants, I have strongly held views on the topic, and I am implicated in the outcome of the research. Another form of bias is response bias (Creswell & Creswell, 2019). It is likely that those who responded to the invitation to participate in the study do not represent typical garden-based educators but are rather people who are similarly passionate and eager about popularizing the practice. Given this response bias, it is likely that research participants, unlike the general population of garden-based educators, may have far more resources and support at their disposal, thus skewing the results.

The narrowly targeted study group was largely restricted to existing self-identified garden-based educators working in primary grades. Given the purpose of this study was to better understand how support for educators can influence the success of garden-based educators, it could have been more illuminating to have included garden-based learners, non garden-based educators, or those who desire to become garden-based educators, to better understand what

barriers currently exist for them to achieve success. Only eight relatively homogenous participants were included in this study (mostly middle-aged women, teachers), which is a relatively small sample size making it difficult to ensure that the experiences, perspectives, and recommendations of participants could be applicable to other educators in this space. Furthermore, participants were also geographically dispersed in terms of the physical and cultural locations; multiple provinces, urban/rural, public schools, private schools, community based non-profits, thus broadening the scope, again making it more difficult to generalize applicable results. Whereas, if all participants were located in one geographic and cultural zone, like teachers in a specific school board, the findings may be more reliable and useful towards making specific recommendations for teachers in that community.

The study was limited since I was motivated to perform this study to complete the requirements for the M.Ed. program. This limited the scope and scale of the research, as well as the potential timeframe to minimize the overall cost to the researcher through additional tuition fees. This was reflected in a decision to limit the participant number to eight, reduce the data collection methods to focus solely on participant interviews, as well as try to avoid vulnerable populations to simplify ethics requirements. With the benefit of hindsight, I can see now how research design should mesh more closely with the theoretical framework. Given that this was the first formal research I have led, I may have stepped too lightly around the subject matter. Thus, the set of questions chosen may not have dug deep enough into the terrain of community activist garden pedagogy, to adequately reflect the critical nature of this research project. For example, while participants were asked questions probing what support they've had or experienced, they weren't asked why. Consequently, questions of power and justice were not included, which limited the transformational potential of the research.

The study was also limited in so far as this was a broad exploratory study of a topic in which very little research exists as most research into garden-based learning focuses on benefits to students, and not on the experiences of educators. The interview questions were exclusively qualitative in scope, however, in reflection I could have integrated a Likert scale (Creswell & Creswell, 2018), especially as it pertained to the types of support accessed by educators and how much they valued specific avenues of support relative to one another.

Finally, the study was limited due to the introduction of Covid-19 pandemic restrictions on research protocols, including the suspension of in person and focus group interviews, as well as the availability of secondary data through the SCDSB. Notably, the lack of focus groups may have diminished the transformational potential of this research by individualizing participants, limiting their opportunity to form a more cohesive community of practice and together work towards imagining and building upon the recommendations of this research. While hosting an online focus group was considered, the uncertainty raised by the pandemic led me to undertaking a simpler approach to this project.

Chapter 4: Results

Eight in depth semi-structured interviews culminated in over six hours of conversational data, which is primarily subdivided based on the three parts of the interview: the participants' context, their conception of success and what actual and desired supports they have accessed or envisioned. Through comparison tables (Creswell & Creswell, 2018) participant responses to key questions are grouped and presented for ease of review and analysis. Cells occupied by dashes (-) indicate a lack of response by a participant to that category. The pseudonym for each GBE is listed in the left column. For each section, a selection of contextualized quotes from participants conveys their experiences in their own words. Finally, a summary and discussion of search word results overviews central themes emerging from the interviews.

Part 1. Participants' Context.

This section of the interview gathered background information on both the educators themselves, in terms of their own experiences that led them to become garden-based educators (see Table 1, attached), as well as their current roles and responsibilities (see Table 2, attached).

When asked to describe their own experiences learning in gardens, all eight participants described “formative experiences” of gardening as children, seven of which were mentored by family. Of those who were taught by family members, three of the seven credited one or more of their grandparents and the other four cited their parents. G spoke about how they have a “genetic disposition” to gardening saying “... my mother was always a gardener. I come from a long line of farmers and crafters that immigrated from Europe and northern Europe...So I think I have a genetic disposition for it”. E described how their love of gardening began with their discovery of mint saying

So my parents were gardeners, my dad, in particular, loved to garden. I remember that he saved marigold seeds from one year to the next. And I thought that was the coolest thing on earth. We had mint growing in a shady spot and it was my favorite plant. I think I discovered mint at like, age, I don't know, three, four. And just like fell in love with the plant and, so it was my first sort of, you know, plant love.

Two cited an influential non-family member with whom they sourced early inspiration, while one stated the “garden was my teacher” and another credited the Land as teacher. Five took part in some type of formal gardening program, three of which participated in a Master Gardener program, which compels gardeners to complete a requisite amount of volunteer hours every year. Two cited permaculture, one in the form of a book and the other took a Permaculture Design Course. Three had an opportunity to work on farms or for landscaping/horticultural companies and three cited influential authors that had inspired them. None mentioned anything about learning about gardening in a school setting as children.

Of the eight participants, two in British Columbia occupied positions within a public school where they had an outdoor classroom and worked as a School Gardening Teacher. One of these school gardening teachers is also enrolled as a PhD student, working as a researcher and consultant in related fields in support of other garden-based educators. This unique position saw these school garden teachers working every class period outdoors and in a garden setting, with different classes. Two participants were classroom teachers in the primary grades but who made use of garden beds at their schools - one of them was also a farmer who runs garden based educational programming through their farm and a local farmers’ market, and the other has authored a book on the topic of school gardens and supports other teachers and schools to start their own. Two participants worked for urban non-profits (in Toronto and Saskatoon respectively) that provide garden-based learning programs connected with schools and extracurricular, afterschool settings, one as a program coordinator and the other as a

founder/executive director. One participant recently moved on from the role of a Student Success / experiential teacher where they often organized field trips for students to a local farm and now works as a vice principal for an elementary school who is now supporting their teachers in experiential and GBL related programming at their school. Finally, one participant worked as an educator at a private outdoor focused school where they managed the garden and developed a curriculum linked food literacy program for children in grades K-8.

Part 2. Defining Success?

In order to better understand how to support educators for garden-based learning, it was critical to understand how they perceived and measured the success of their programs. Each participant was asked about their primary and secondary goals as garden based educators (see Table 3, attached) along with how they measure success (see Table 4, attached).

Every participant noted multiple goals they have as garden-based educators. When asked what their main goals were, half of the respondents said that it was fundamentally to cultivate joy in their students. Using the language of joy, E noted how “The garden is a place of safety & joy.” B stated emphatically “My main goal, I think, above all else is for the students to experience joy. I want them to have a really positive emotional response and connection to what we're doing - everything for me is secondary.”

B further connected how the experience of joy can create a positive and engaging learning environment saying:

... if every time they're out and they're experiencing something new and it's positive, and there's those times when they feel genuine joy or pride or a real sense of accomplishment. Then their connection to the natural environment ...is a good place. This is where I feel good. And if I feel good here. Then I want to help look after it and take care of it and learn more about it and think about it.

H summed up the importance of happiness and wellbeing in learning stating,

I think that's really, really important that kids are actually happy learning, yeah it's hard to learn when you're sad, you know it's hard when you're not wanting to learn so yeah I do I just think student well being, community well-being is important.

G associated being comfortable with pleasure, joy and success stating, “I think for me the measure of success is joyfulness ...It's that simple”. Two others said that their main goals were to either foster “student engagement and curiosity”, or setting and achieving “student-centered goals”, as varied as they may be. One participant's main goal was cultivating horticultural related skills and knowledge and one considered nature connection and stewardship as their main goal.

No one ranked academic/curriculum goals as most important, one participant saying conclusively “it should be a starting point as teachers...but isn't for most.” Common secondary goals cited by participants included health and wellbeing (7/8), nature connection and stewardship (5/8), horticultural skills training (4/8), academic/curriculum based goals (4/8), and cultivating joy (2/8). Additional goals cited by participants included: promoting economic self-sufficiency among students, building a sense of teamwork, cooperation, empathy, and care, supporting healthy relationships between people and place, between fellow students, between Indigenous and non-Indigenous students, self-confidence among students and teachers, and a sustainable program that is well utilized by fellow teachers. Unlike the majority, F thought differently about goals saying that success “looks different for everybody.” F as a former teacher and now Vice Principal acknowledged the importance of goal setting and how our goals influence our approach to teaching saying

... I think we have to be aware in education of what our goals are, as educators, right, like what was my intention and my purpose for going there. Then the more powerful stuff really comes from where the kids take it, and if you give them the freedom they will take it where they needed to go and that maybe you have a class of 30 kids going in, you know, 15, 20 different directions.

Participants were asked more specifically to describe what they believed success looked like in GBL programs and for their approaches to measuring it. All eight participants noted the role of student feedback in measuring the success of their programs, two of which cited more formal expressions such as through outgoing surveys, whereas the remainder spoke more broadly about student engagement including students clearly having fun, laughing, smiling, and speaking positively of their experiences after the program. Two spoke about the role of parental feedback in measuring success of their programs. Two cited food production as a measure of success, specifically tracking the overall production of produce. Whereas, two cited production as conditional measures of success depending on the goals set by students or garden organizers, and more specifically it is successful if the produce actually feeds the students and their families, even if it's "just a taste" as one pointed out. One participant explicitly stated that production is not a measure of success and warned against using it as such, especially in a school setting. One participant spoke about the triangulation of data for measuring success, and one suggested that photos and videos could be used to help measure success. Two participants noted the importance of changing food related behaviours, for example, students being more likely to try new foods or desire local and sustainable options. One noted how a successful program goes full circle to include planting, harvesting, and eating of the produce and C made the case that success and "real rich learning" stems from cross-curricular programming. One spoke of the use of positive feedback from other teachers who have observed benefits for students. Finally, one said that a successful program is one that is well supported.

E encapsulated sentiments of several interviewees who were critical of the mainstream assessment policies saying, "You're asking a former student success teacher who wants to change the entire assessment policies...". J who works for a non profit corporation outside of a

school setting also spoke to the difficulty of assessment saying bluntly, “That's a tricky one because it's hard to measure.” However, they measure success using a mixed methods approach conceding “it's a lot of tracking, we do both quantitative and qualitative” including production goals and qualitative impacts on participants.

B speaking about the feedback they've received from their colleagues says

...I have had teachers come and say, oh, they're so much more focused when they come back, or I can tell, like the way they came back, I can tell. Whatever you did they had so much fun because they were just smiling and happy and talking about it... oh my gosh, they love it, like they couldn't stop talking about whatever it was we did that day, like, you know, making bird feeders, or that the bird landed on their hand.

H spoke to the interplay between support and success, in which a successful program is one that is well supported, that is, it is successful because it is supported, and it is supported because it is successful.

...success is creating a program that's sustainable and you've got all the tools and equipment that you need for the kids and all that. To make it run well but also being supported, I think... to be able to do so, and continue to do so successfully, you have to be supported by your school board. And then the outcome being - is it reaching the community, is it reaching the kids, is it important to them, are they talking about an outside of class, they definitely are, and is it impacting them in any way and I think it is.

As someone who works supporting fellow GBE, G's success in this regard is when teachers become “self-sustaining in their own ability to learn and use their gardens as classroom spaces.”

G was especially critical of third party organizations who often fill this space, who can bring with them their own goals and agendas that may be contrary to those of teachers and students.

For G, success comes when one understands that gardens demand a “growth mindset”

acknowledging that “I don't know how to plant corn - yet...”.

Part 3. Documenting Support for Educators.

The final section of the interview aimed to document all the currently available support offered and taken up by educators to develop their capacity as garden-based educators (see Table

5, attached), in addition to what they would like to see available in the future (see Table 6, attached).

While six of eight participants received their B.Ed., only two were able to draw any links from their formal education to their current role. Speaking about their B.Ed. experience and whether any of it related to GBL, B said confidently “No, it was non-existent. It wasn't even spoken about.” Of the two who noted the connection, one had an opportunity to do a course-related project running a campus garden program, the other noted how their training in experiential education at both the B.Ed. and M.Ed. prepared them for GBL. The other four who received their B.Ed. degrees were uncertain what, if any, preparation they received from their program for their current roles as GBEs. It was the lack of formal support that led G to seek to change that stating:

my teacher training was way back in the mid 90s. I don't know that we had a lot of or any education as a pre-service teacher on how to use school gardens. Although I will say that I have made it my life's work to make sure that resources are available for pre-service and practicing teachers that I wish I'd had. So, for example, my website is full of cross curricular ways to teach in school gardens.

While seven of the eight participants engaged in various forms of professional development in both formal and informal means, B said that while these opportunities are out there, they are not obvious and “it's what I seek.” Three had taken part in a master gardener course in order to improve their horticultural knowledge and skills. Three were members of some type of PLC with other garden-based educators. Two offer training for other GBE. One noted that they attended two GBL related conferences and one found support in a Permaculture Design Course and their degree in environmental studies. One also spoke about the support they'd received from their local university, as well as a national seed saving non profit corporation. Five spoke about the support they have received from community garden groups in their areas, one of which noted the

support of a major botanical garden, one cited their local food bank and a city-wide garden related committee. All eight said that they learned through trial and error and personal experience gardening and educating others.

In this realm, the garden itself was a source of support and encouragement and one noted how the garden serves as a third teacher and creates a new power dynamic within the classroom, one in which both teacher and student are learning from the garden. The internet was also a source of support and information for five participants, one going so far as saying that the “internet was my best friend...because... I like to work really independently...I could just find what I wanted to know quickly.”

On the internet, participants found community and support in Google and Facebook groups, websites and twitter accounts mostly to access curriculum based resources and lesson planning ideas. Seven spoke about the support they receive from their organizations. Two were thankful to be able to work as full time outdoor-garden educators with very supportive colleagues, administration, school districts and policy frameworks. Two worked for non-profit organizations whose mission included GBL, so they obviously received significant support from their organizations to develop and deliver their programs. Three noted that while their organizations have offered some support, it was generally insufficient, and they found this to be frustrating and an impediment to their success. Speaking to this frustration, C said that there is “No mandate or policy...It's all individual teachers just trying to promote it... on their own.” However, one of these three noted that they received significant support from a local garden-based educator/farmer with whom a successful partnership made up for a lack of organizational support. Two also spoke of the support of their parent advisory councils, and two noted support of local businesses in providing resources and infrastructure. Seven of the eight participants

spoke about the external funding they have received for their programs, five of which received relatively small grants from large corporations, and the two who work in non profit organizations both relied on funding from the federal Canada Summer Jobs grant program. All seven spoke about how relatively easy and reliable these granting sources are and how they usually receive what they ask for.

Discussing what kinds of support the GBE would like to have available to improve the success of their GBL programs, participants spoke to a range of different possibilities. Four participants called for the creation of full time paid garden educators, either in individual schools or as district wide consultants who can support teachers within a given jurisdiction. One suggested more opportunities to integrate GBL within planning times of teachers, or within other subject areas like science, health and physical education. One participant suggested that local farmers and gardeners and their farms and gardens could be partnered with to serve as GBL consultants. On this note, F added that it can be particularly inspiring for students to engage with a passionate full time farmer/gardener who can engage the students in ways their teachers may not be able to. F acknowledged the knowledge gaps of teachers in this field saying "... we can't know everything. So when we bring together a team of people who have different sets of knowledge... and put it together we definitely get some product for kids that's way better than what we can do individually...". E added that it is important for there to be lower adult to child ratios "so that all the children have a hands-on experience that they're not waiting in line" implying a need for more teacher, parent or volunteer engagement in programs.

Seven of the participants spoke clearly about the need for more funding and resources to support the work of GBE. Participants proposed a range of needs to be supported, two of which noted specific infrastructure pieces like having a storage shed to keep equipment or irrigation to

reduce labour, especially in the summer months, one other wanted funding for capital projects in general. One spoke to funds either in the form of specific “maintenance grants” or “start up grants”, two called for funding in general to scale up the existing programs. Two wanted to see more funding for field trips to local farms and gardens, one with a clear tie into experiential learning opportunities. Two wanted funding targeted to developing partnerships, one between schools and farms and another between schools and Indigenous Elders and communities. One wanted to see municipal support and funding of GBL programs, especially filling the summer gaps when schools are not in session. Finally, one wanted to see more access to land to establish GBL programs and suggested that farmers/landowners may be subsidized or supported financially to make space available for such programs.

Five participants made reference to their desire for curriculum based, GBL resources especially in the form of kits with resources and lesson plans. One wanted to see a booklet or catalogue of resources made available and another suggested these kits could tie in broader outdoor education interests as well. One suggested that a district-wide GBE could help to develop and coordinate these kits to ensure they are relevant and well utilized.

All eight participants wanted to see more support for professional development, for themselves and their colleagues. One in particular wanted a specialized program for GBL and an associated bursary to support the attendance of low income practitioners. Two spoke specifically about PD days, one wanted them to happen more during school hours, so they didn’t have to volunteer for it on their weekends, and another wanted to see a greater emphasis on outdoor education during their PD days. Six respondents spoke to specific content they would like to see offered as part of their professional development including outdoor education, risky play, confidence building for teachers, nutrition education, crop planning and gardening logistics, and

Indigenous and climate change related content. J wanted a structured opportunity to participate in planning for a whole garden program from start to finish, and in different settings, as they had only joined a program that was already established. E and G especially spoke to the idea of confidence building, noting it's not necessarily about gaining gardening specific knowledge, but rather confidence in themselves as educators and learners alongside their students. To this point J spoke about the reticence of educators to join GBL programs for fear of failure and killing plants and the importance of getting comfortable with taking risks, "... if you make a mistake and you kill it, it's fine. Just put it in the compost and that's a win, too." Two participants spoke of their desire to have an active, local professional learning community to support them, one specifically wishing their colleagues were more interested.

Speaking more broadly about what kind of support they'd like to see from their administrations and community the participants offered a range of ideas. Two spoke specifically about how they'd like to see a "garden at every school". Towards this end, two suggested that it would be helpful if there were garden policies and protocols at the board level, providing clear and simple instructions for how to start a school garden along with a start up package including lesson plans. From their administration, one wanted to see a greater recognition and appreciation of the overall educational benefits provided by the gardens for the students. Three spoke to the need for community support - one saying that their programs would benefit from having a group of a minimum size of four to manage it. One participant specifically wanted more community involvement, from parents and neighbours, during the summer months. Finally, one wanted to see more opportunities for inter-provincial networking and virtual knowledge sharing among GBE.

Reflecting on how lucky they were to receive the types of support to work as a full time garden teacher, B reflected that school gardens typically depend on “really passionate committed teachers, kind of doing it on their own” or “champions”, a word used by three participants. B provided a link to their school boards Outdoor Greening Guidelines which they developed after a well-spring of “gung-ho teachers” were just “going ahead and doing it themselves”, then having to remove or relocate the gardens because they were improperly located. According to B, the guidelines provide direction on how to organize the physical and social components of the garden, as well as manage it throughout the school year, including summertime. G agreed with B stating “... the biggest thing that I see that makes a difference for school gardens ...is having that specific targeted support at the district level.”

Speaking of the lack of school board support, H mentioned

... if I was working at the board office I would be looking at this model and saying what's going on with this and how can we be replicating it, that's just the way that I am. And, and again like, how is it successful or not, but there really hasn't been much intervention or support like that at all.

When asked whether there has been any support from the board H responded:

No, no, not except for funds that I've asked for....I know there's a school garden at _____ but it's totally overrun and they need some workshops for teachers to actually learn how to teach in the garden. Which is what I'm hoping to do.

Explaining why it is difficult for teachers to upkeep and program gardens at their school H goes on to say:

... teachers have a really heavy workload for the most part, and, um, it's like one more thing on top of that workload, if you have the knowledge or the interest to do it, you got to take it on yourself, right, yeah, really like at this point that's sort of the dynamic of it. And even all those committee members that we worked with a bunch of them are teachers, they hardly ever get into the garden. It's kind of sad really.

A few spoke to the role played by mentors in the gardens. Trying to incorporate more Indigenous content including Indigenous language learning opportunities, E spoke about the need to engage

“Indigenous mentors and knowledge keepers into the programming” but said the barriers to that are often the time it takes to build relationships and then funding. In this direction, J spoke of the importance of building reciprocal relationships with mentors, especially Indigenous mentors. J says “...whenever we're going out for a field trip to a garden site or to a mentor for a workshop or whatever we always offer or create an opportunity to give back. So, whether that means we're turning soil for an afternoon or helping them to prune or harvest”.

B reflects on the potential for more experienced GBE to mentor less experienced ones in the school by stating “So I think ... in an ideal world, you'd have a mentor, where you're working alongside someone who's an experienced outdoor educator.” B’s reflections on her colleagues' reluctance to want to bring their students outside stems a lot from fear and a feeling of insecurity in how to manage or teach outdoors, beyond the four walls of the classroom where she said things may seem more complex and unfamiliar. B was confident that having an experienced mentor alongside for the beginning can help to alleviate potential fears and anxieties of new teachers exploring GBL for the first time.

Thematic Analysis of Word Usage

Inspired by a grounded theory approach (Creswell & Creswell, 2018), a thematic analysis of words used by participants was deployed to derive deeper insights into the phenomenon of GBL and in particular the experiences of educators. A word search was performed on over 160 words related to the subject focusing on a range of themes emergent within the interviews. Words were noted for their overall frequency (f) of occurrence, as well as the number (n) of participants who used them, and the general contexts in which they were used. The word search helped to reveal interesting and common ideas as well as revealing those less common or absent from the discussion.

For example, eight participants (n=8) used the language of “love” (f=40) mainly to describe their own love for gardening and that which they witnessed in their own parents and their students. The language of “joy/enjoy/ing, happy” (f=49) was used by six participants (n=6).

The only specifically garden-related words spoken of by all eight participants (n=8) were “seed” (f=91), “soil” (f=43), “plant/ed/ing” (f=63), “grow, growth, growing” (f=108), “food” (f=155), “farm, farmer, farming, farmed” (f=112), “garden, garden based learning” (f= >300). Some words like “harvest/harvesting” (f=10) were used by six participants (n=6), however the other two (n=2) used the language of “picking” (f=4) instead.

Non-garden specific language noted by all eight participants (n=8) included “curriculum / curricular” (f=58), “education” (f=80), “experiential, experience” (f=75), “fund/s/ing/raising” (f=64), “learn” (f=200), “program, programs, programming”(f=164), “school/s” (f=300), “skill/s” (f=20), “student/s (f=115), “teach/s/er/ing/” (f=379), “work/er/ed/ing” (f=280) and “connect/ed/ing/ion” (f=60).

Regarding the seasons, seven participants (n=7) spoke about “winter” (f=13), “spring” (f=23), and “summer” (f=55), while comparatively, “fall/autumn” (f=7) was spoken about by four participants (n=4). Of the references to summer, about two fifths of the references spoke about the participants' own personal experiences gardening during summer, the rest spoke to the unique challenges that summer presents to school gardens especially. References to winter were focused on aspects related to planning, meetings, learning and growing, whether indoors, or outdoors where climates allow.

On specific material needs and inputs, again, all spoke about “seed/s” (f=91) and “soil” (f=43) whereas four participants (n=4), mostly those with more professional backgrounds in horticulture tended to prefer the language of “compost” (f=30). “Soil” was spoken of in the

context of learning about it, bringing it in, and improving it. Most (n=6) acknowledged “water/ing” (f=16), “plants” (f=36) and “land” (f=40). References to “greenhouse/s” (f= 15) were made by five participants (n=5), notably as a space to extend the season and programming opportunities. Only two (n=2) referenced the “sun/light” (f=2) and it was about the positive feelings of sunlight on our bodies when we go outside.

Speaking about specific curriculum subjects, predictably, “science” received the most mentions (f=25) by five participants (n=5), the same number who spoke of “math” (f=18). “Biology” (f=5) was mentioned by four of them (n=4). “Literacy” (f=3), “language” (f=7) and “art” (f=6) were both mentioned by three (n=3), and one of those references to language was regarding learning Indigenous languages in the garden. “Social studies” (f=2), “food literacy” (f=7), “ecosystems/ecology” (F=8) were each mentioned by two (n=2). One person each mentioned “music” (f=1), “history” (f=1), whereas there was no reference to “drama” (f=0) or “geography” (f=0). The music reference however was in a suggestion that a position be created, like an itinerant music teacher, but for gardening.

Only one participant (n=1) used the word “pedagogy” (f=4), who was also a PhD candidate in Education. “Outdoor education/learning” (f=7) was referenced by five participants (n=5), three (n=3) referenced both “hands-on” (f=7) learning and “land based learning” (f=5), while (n=1) one participant talked about “Indigenous learning” (f=1) in particular. “Health based learning” (f=1) was cited by one participant (n=1); however, all eight overwhelmingly used the language of “experiential/experience” (f=75). References to garden-based learning were excluded due to the prevalence of this language throughout the interview questions.

On the theme of institutional authorities and specific figures in the school setting, seven (n=7) referenced “school boards / districts” (f=57) and six (n=6) cited “staff” (f=22),

“principal/s” (f=23) and “admin/istration/s/istrators” (f=19). Most of the references to principals and administration spoke about how the absence of support can make it difficult to start and sustain GBL programs. Only three (n=3) participants spoke of “policy/ies” (f=6) and “politic/s/al” (f=4), one saying that they don’t follow politics, one speaking about the critical thinking they’ve developed through their political science degree and oneself identifying as a “radical” who engages their students with critical food issues. Only one (n=1) spoke about the role of the “grounds department” (f=1), while none referenced janitors or school board trustees specifically.

On relationship building beyond the school, seven (n=7) referenced the importance of “family/ies” (f=31) and “community/ies” (f=77) in supporting the garden, but also noting how the garden supports them. “Parent/s” were specifically mentioned by six people (n=6), especially the role of parent groups or individual parents supporting the garden program. Meanwhile five (n=5) spoke about the role of “volunteer/s” (f=11) and having a strong “network” (f=25). Only three (n=3) spoke of building “partnerships” (f=28), and (f=27) of those were cited by two of the three (n=2), whereas one (n=1) warned about the role of “third party organizations” (f=3), especially in public school based gardens.

As I had approached this research from a critical social justice lens, I was curious to know to what extent critical garden issues, as discussed within the preceding literature review, were referenced by participants throughout the interviews. “Indigenous” (f=23) was referenced, as it relates to Indigenous peoples, by three participants (n=3), however most of the references were from two of them, one who works directly with Indigenous youth. “Native” (f=5) was referenced by one person (n=1), and that was in the context of native plants in the garden. “Land acknowledgement/s” (f=3) was discussed by one person (n=1) as was “colonialism” (f=2),

“global south” (f=2), “slave/ry” (f=1), “rac/e/ism/ist” (f=1), “equity/equitable” (f=1). The words “settler”, “residential schools”, “black/African”, “justice”, “equal/ity”, “land access”, “democracy”, and “minority/ies” received zero mentions. Only two (n=2) spoke explicitly about issues of justice. One was vocal about their efforts towards anti-racism and decolonization, as they work in a culturally diverse community, often with newcomers, Indigenous and refugee students, whereas another spoke about accessibility and equity as a motivator for establishing raised beds at the school.

The search word results from the interviews, when combined, string together the essential activity of all participants in their garden-based learning practice which is the process of planting and growing seeds and plants for food. The thematic analysis revealed certain words utilized by all eight participants, and when strung together brings forward their collective focus: working (f=280) to connect (f=60) curriculum (f=58) based, student-centered (f=115) experiential education (f=75) and skills (f=20) learning (f=115) programs (f=164) in schools (f=300).

Summary of Findings

All of the participants grew up gardening and most currently work within the elementary school setting where half run regular (daily) gardening activities with their students, one runs an extracurricular program with teenagers and the others engage in occasional GBL programs. All but one works primarily with learners in the primary-junior grade level. The focus of these programs according to participants tends to emphasize engaging students with planting and growing activities in the spring and less so with harvesting related activities in the fall. The diversity of educators produced a range of responses when it came to understanding how they measure the success of their programs. Half considered their primary goal to be cultivating joy in

their students, and the other half considered other goals like student engagement and student success, horticultural skills and environmental stewardship.

Most of the participants relied on qualitative evidence, especially in the form of informal student feedback to measure the success of their programs. A minority considered the use of quantitative data, such as overall productivity measured in weight or harvest as an indicator of success, but an equal number warned against relying on such quantitative measures. Most participants found little or no support in their B.Ed. programs to support them directly in GBL programs; however, a minority were able to make connections between what they learned in other courses more specifically to horticulture or the environment, and graduate level education programs.

While five out of eight found a high level of support from their organizations, two working explicitly as garden based educators in a public school, one as an outdoor educator in a private school, and two working for non profits focused on GBL, the other three noted a lack of support received from their administrations. All participants however sought out and received support from their communities, both online, in person and professionally, and continued their own personal practices of gardening to develop their own skills and comfortability in the garden. A majority would like to see the creation or expansion of full time garden-educator positions, or district-wide GBE consultants. All would like to see additional funding and resources, especially in the form of start up and maintenance grants and curriculum-based lesson planning kits. All spoke to their interests in a range of professional development opportunities and most wanted more supportive administrations and board policies and protocols in support of GBL programs. Several participants spoke about how they often feel alone in their practice and how they would

benefit from a more reliable support system in the form of an active, local professional learning community.

Chapter 5: Discussion

Introduction to Discussion

This discussion will interpret the findings within the context of the established literature on the topic. I have divided the discussion into sections corresponding to the findings, specifically part 1 will discuss the formative experiences of GBE, part 2 considers how they conceive and measure success, and part 3 looks at their support systems. Then I will present limitations and recommendations for future research and a critical garden pedagogy, and then recommend actions to support the GBL ecosystem, from individual practitioners to institutions.

Part 1 - Formative experiences

According to the findings, all participants experienced formative garden-based learning opportunities as children, with nearly all of them gardening with adult family members at home. This phenomenon was noted by famed horticulturist and educator Liberty Hyde Bailey over a century ago saying, “Yet I fancy that more than one human being has been led to a love of plants from having first known them in some grandmother's garden.” (Bailey, 1901, p. 275).

While the literature on school gardens tends to focus on the experiences of children (Nury et al., 2017) there is a subsection which focuses on teachers’ perceptions of teaching in gardens (McMillen et al., 2019). Jorgenson (2013), through a phenomenological study of garden educators' motivations, shows how teachers tend to re-enact their foundational beliefs about teaching and learning, beliefs based in their own childhood memories, which in this case helps to explain the motivations of the educators interviewed for this research. In the context of early childhood GBL programs, McMillen et al. (2019) documents the importance of educators being comfortable outdoors in nature as one of several causal factors influencing teachers' adoption of school garden programs, alongside administrative support, a focus on safety, and knowledge and

skills. It was noteworthy that all of the participants spoke at length about their experiences gardening as children where many developed a “love” for it, a love often shared by their parents or grandparents. All participants continued their practice of gardening throughout their lives, most of whom either worked professionally in horticulture related fields or have sought additional formal education to improve their knowledge, skills and comfortability. Speaking about the causal condition of being comfortable in nature, McMillen (2019) noted that “participants indicated that someone with interest and comfort in nature needs to show initiative to get the preschool garden started and if that person is not identified, the preschool garden might not get started or be sustainable.”

The need for a champion was frequently cited by participants, and nearly all of them were themselves champions who initiated or dramatically expanded the GBL programs they’re currently engaged in. Without a strong personal or familial connection to gardening, new teachers may depend even more on formal training, or the informal, community sphere in order to gain exposure, confidence and skills to be successful. This lack of accessible pathways into the garden figuratively and literally, may prevent more diverse educators from engaging in the gardens, thus limiting the range of possibility and success. Participants made several references to the lack of comfortability that their colleagues had in the garden, as a reason why more don’t engage in the GBL programs with the enthusiasm they do. The underlying trend that one needs to be brought up in this space threatens the success and sustainability of GBL programs by reducing the eligibility of potential leaders who come from diverse backgrounds, including those without close family ties or formative childhood experiences. When the space is dominated by those who have spent their entire lives learning in the garden, it can be intimidating for newcomers to enter and assume positions of leadership. To address this lack of comfort from

gardening newcomers, one participant suggested more mentorship opportunities between experienced GBE and those new to the field.

Part 2 - Success & measurement

It was evident from the findings that all participants had multiple goals and only a minority were absolutely clear about their main goal, which is in line with the research findings on other GBL programs, which shows that programs are rarely, if ever, only about one thing (Blair, 2009; Ohly et al., 2016). For instance, one of the teachers set out with a goal of fostering a holistic mind-body connection in students, but when asked what success looks like, reflected that success looks different for each student - and that success depends on satisfying students needs and goals that they have set for themselves. Participants, like those in Haase's recent study involving GBEs in Ontario, clearly found it hard to reduce their goals to a "single theme or component", but rather articulated it as a "combination of values and learning outcomes" (2020, p.53). When pressed further for their main goal, half of the participants stated that it was cultivating joy in their students. This emphasis on eliciting a positive emotional response to learning is supported by evidence contributing to improved educational environments and attainment (Waite, 2011). This connection between joy and success was not lost on some of the earliest and strongest proponents of school gardening, like Bailey, who said "to make a garden in which one finds joy cannot be successful", and that joy stems mainly from the "satisfaction of causing things to grow" (1901, p.275).

Wake has spoken on the need to lessen our emphasis on adult agendas when planning for successful and sustainable garden programs, and instead focus on children's needs (2018). When asked for their opinions on what they thought the purpose of school gardens were, a collection of children in a school garden program in Amsterdam, by a clear majority, stated that it was to have

fun (Nury et al., 2017). While having fun and cultivating a joyful learning environment was noted as the main goal - there were many similar motivations cited by both students and teachers in the research study (Nury et al., 2017), such as horticultural training, healthy eating and environmental stewardship. Whereas most participants approached GBL with specific motivations and goals that they wanted to achieve as educators, a minority of participants focused specifically on empowering students to set and achieve their own goals.

A minority of participants' reflections leaned heavily on self-determination theory which has helped to support and predict achievement in school garden programs (Skinner et al., 2012). According to Skinner et al., self-determination theory states that people are motivated to act based on three core needs “relatedness (to feel they are welcome and belong), competence (to feel they are efficacious), and autonomy (to feel self-determined in their learning)” (2012, p. 18). GBL programs are well suited to provide these basic needs to students, which can inspire student engagement in gardens and in other related aspects of their lives such as school achievement (Skinner et al., 2012).

A teacher's learning goals, or outcomes should influence their pedagogical approach. If teachers are approaching with their own outcomes in mind, whether they are to teach horticulture, curriculum, or to cultivate joy, they may deploy a different approach than if the intention is to engage students to set and achieve their own goals. For example, for teachers whose goal is to cultivate joy - the question is what can make for a more joyful garden? How might the GBL program look if the main goal is to focus on children's needs (Wake, 2018) and empower students in their own learning journey? In either case these may be questions best put to students themselves. Teacher-led or student-led goals are not mutually exclusive, but they can

be mutually supportive. For example, a more joyful student may be more inclined in pursuing academic success, or in stewarding the environment in which that joy takes place.

When asked what their favourite activities were, students in Amsterdam said that they most enjoyed harvesting activities, followed by planting and sowing seeds (Nury et al., 2017). This is interesting to note, because harvesting was one of the least referenced activities that our GBE engaged their learners with, similarly, fall was the season least referenced, and is typically most associated with harvest time (in Canadian climates). One participant noted how they would like additional support for crop planning and the logistics of gardening in order to improve opportunities for harvesting, which in my experience, can be achieved through a diversification of crops, including seeds. By improving opportunities for harvesting, more students can experience the joy and varied benefits of tasting the harvest - a key activity cited by participants and a core component of successful school garden integration, along with the core component of crop vitality and diversity, cited by Burt et al. (2017) in their GREEN Tool.

Only one participant indicated that they have an evaluation form that they use to evaluate their program, a standard form that their non profit organization uses for its varied programs. Most participants however did not cite a coherent evaluative framework for measuring the success of their program, unsurprising given most of these programs are stand alone, and disconnected with a broader systemic initiative. There have been efforts made, especially by Burt et al. (2014, 2017, 2018, 2019) and Diaz et al. (2018) to develop tools for measuring the successful integration of school garden programs, both tools developed in concert with a city or with a regional network of practitioners. Both examples by Burt et al. (2017) and Diaz et al. (2018) involve many considerations for evaluators, including 19 components and four domains for Burt et al., and 38 outcomes (distilled from many more) proposed by Diaz et al. to be used for

program development and evaluation. The range of components and outcomes is indicative of the range of activities that take place within GBL programs. Skinner et al. (2012) have developed measures to assess student engagement in GBL programs, including student and teacher reporting tools, and note that student engagement can be a driving factor of student success.

Proving the success of a program is often necessary to justify its continued existence, along with justifying continued program resourcing. For one of the participants, having teachers coming back to the program year over year, was itself a clear indication of success. Ensuring that programs have a transparent set of measurable outcomes up front can support program development and implementation long term by providing a roadmap and milestones along the way. Burt et al.'s (2017) GREEN Tool is structured around four domains: resource and support, physical garden, student experience, and school community. According to Burt et al. (2017) resources and support are the first domain of consideration in which budget and resource requirements are the first component determined in light of the physical garden's goals and values. Evaluation and feedback together form a core component of what Burt et al. (2017) have classified as a well integrated school garden program.

The values of an educator or educational institution can be reflected in their goals and evaluative frameworks. For example, Diaz et al. (2018) sourced their 38 outcomes from a diversity of educators in the state of Florida. While these evaluative frameworks can be used as inspiration for other GBL networks and educators, they are not necessarily transferable from one location and time to another, as is evident from the varied responses of each of our participants. Each jurisdiction, even every individual program, would do well to establish their own expectations surrounding outcomes in order to have a clear understanding of what their programs are trying to achieve and how to achieve it.

Having approached this research project through a critical lens, I was curious to what extent participants considered issues of social justice in their programs or engaged in what Kelly and Nash (2021) would classify as critical food literacy and the related concept of critical garden pedagogy (Cairns, 2018). Only one participant, as a self-described “radical”, spoke significantly about issues of justice such as racism, colonialism and climate change education in their GBL program, whereas another spoke critically about the globalized food system in general. This minor level of engagement with critical garden pedagogy and critical food literacy, roughly relates to its limited prevalence within the wider world of food literacy programs that Kelly and Nash surveyed (2021). Most of the GBL activities described by participants would fall under the functional and interactive food literacy categories (Kelly and Nash, 2021), focusing on basic food related knowledge and skills developed through hands-on experiences. In order to effectively integrate all three types of food literacy, GBE could utilize the analytical grid developed by Kelly and Nash (2012), which clearly articulates the descriptions, key terms, and examples of activities typical of functional, interactive, and critical food literacy interventions.

Part 3 - Support systems

Within the broader yet still emerging literature focusing on teachers' perceptions of teaching outdoors, Pedretti et al.'s (2012) baseline study of outdoor educators in Ontario offered some key findings that correspond to those articulated here. Specifically, Pedretti et al. (2012) spoke of the desire among outdoor educators for more professional development opportunities and noted how such opportunities must be tailored to meet educators where they are. Such opportunities according to Pedretti et al. (2012) may include membership within professional learning communities with diverse peers, along with participation in programs at well established centres for outdoor education. All the educators interviewed in this study already had a strong

personal interest and experience in outdoor education, whereas this may not be the case for all educators.

Centres for GBL - in the absence of purpose built spaces - may include local farms and community gardens, and along with the gardeners and farmers who tend to these spaces, these partnerships could help to form that professional learning community where new teachers can gain formative experiences, comfortability and self-confidence. Furthermore Pedretti et al. (2012) spoke to the need for further outdoor education opportunities within pre-service teacher training, either through dedicated courses or integrated within related courses. This call to address the gaps in pre-service teacher training was echoed by at least one participant, who has made it her mission to fill that gap, as it relates especially to GBL. Haase (2020) noted similar suggestions for support desired by Ontario based garden educators, including the hiring of garden coordinators to support teachers and school garden programs, as well as teacher education and ongoing support.

Five of our participants in our study spoke about their desire for having more resource kits available to them to support their GBL programs. Such kits can be divided into two main categories. Firstly, resources that are designed to educate and empower teachers, such as books, best practices, lesson plans or ideas for activities. Secondly, resource kits that include the physical materials necessary to run the program, such as seeds, journals, tools, activity sheets, microscopes, etc.

Whereas local libraries and the internet are overflowing with supportive literature to inspire and educate GBE, such resources may not be well curated or contextualized for educators according to their unique socio-cultural-ecological climate. Speaking about the wide-spread availability of ready-made kits for environmental educators, Pedretti et al. (2012) agreed that

such kits may not consider teachers' standpoint and reality. Going further, Pedretti et al. (2012) suggested that beyond kits, teachers would benefit from having additional time “supporting research and educational opportunities to nurture the development of strong communities of environmental educators in schools” (p. 11).

Recommendations for a critical garden pedagogy

The study was limited in several respects as previously mentioned in chapter 3, which leaves many opportunities for further exploration. From a critical garden pedagogy perspective (Cairns, 2018), future research would benefit from more specific inquiry into the issues more relevant to unpacking the question of who is engaged in this work and why, and from there, go on to consider who is not represented in this work and how that impacts all learners. Learning from Penniman (2018) and White (2018), it is essential that critical garden pedagogy centres BIPOC people and seeks to build community power based on economic cooperation and self-sufficiency rooted in the land, so as not to reproduce white and wealthy spaces and systems that do not serve oppressed peoples. It is essential that critical garden pedagogues question the roots of land ownership and dispossession on which GBL programs take place, or don't, and consider ways to meaningful reconnect people with their ancestral lands and food systems, especially Indigenous peoples and Indigenous food systems (Settee & Shukla, 2020). While it was not the focus of this research to take detailed demographic data on the participants, positions in education are dominated by relatively middle class, middle aged, white women. How may people from different backgrounds come to grow in the garden and how may more diverse representations among GBE influence students? In addition to perspectives of race, class, and gender, it is also important to consider educators who may be linguistically diverse, such as fluent in Indigenous languages that are taught within and through GBL programs, and with

diverse physical, mental or learning abilities who can bring their intimate real life experiences to improve inclusion for all students.

Given the fact that all of the participants enjoyed formative experiences gardening as children, it would be interesting to explore how people may arrive at GBL without having experienced it themselves as children. With the increasing urbanization and resulting disconnection from the land, it may be the case that more and more new teachers will have less experience gardening as children compared to their older counterparts. Emerging teachers may be coming to teach with drastically different backgrounds and lived experiences compared to established teachers. New teachers may have grown up in a world in which access to green space and the outdoors may be far more limited than previous generations, this issue of spatial equity, determines in part who has access to green spaces suitable for a wide variety of growing activities (Louv, 2008).

Future research may consider asking more specific questions inquiring how intersecting social group differences may manifest through GBL programs - and thus expand or limit the range of successful outcomes for learners. Studies have shown a greater range of positive impacts on students from lower income or other marginalized backgrounds participating in GBL programs (Ruiz-Gallardo, 2013; Sandler et al., 1995). Critical garden pedagogues should also stay grounded in recognizing the limitations of GBL programs. Schools are not an island - and in order to effect meaningful long term change, consideration must be given to empowering students to challenge systems of domination in all aspects of their lives, not just the few hours they may be in the school. Future research may explore how GBL programs could empower students to bring forth long term transformations in other areas of their lives (Ohly et al., 2016). Future research ought to further consider how to grow beyond the garden, integrating parents and

the community, cultural leaders for underrepresented groups, and working towards building systemic changes in the relationships between people in, around, and beyond the garden.

Recommendations to establish a thriving and resilient GBL ecosystem

Below is a summary of recommendations targeted towards the main constituencies engaged in this work: GBL advocates, students, teachers, parents, school boards, administrators, other staff, community organizations, municipal, provincial and other public institutions such as public health and post secondary institutions. The recommendations are based on a relatively comprehensive scan of the existing literature, insights derived through this research and from my personal experience as a GBL practitioner and advocate.

GBL advocates & demonstration sites

To advance and sustain GBL programs within a community, it is important that GBL advocates push to establish a demonstration site. To ensure resilience, such a site ought to be integrated across diverse sectors (such as education and health) and can be used for year round all ages programming, teacher training, networking and capacity development. Such a site can support a deeper societal integration of the values and practices associated with GBL within local institutions and form a central node within an ecosystem of GBEs and organizations.

Post secondary institutions & faculties of Education

Campus food systems act as microcosms for the wider food system and are hotbeds for a wide range of critical food system interventions, including campus gardens or farms (Levkoe et al., 2019). There are many different campus garden or farm initiatives within Canada with some campuses maintaining different initiatives of various size and focus, including student-led, faculty-led, program based, and community engaged. Few examples exist in Canada where faculties of education have utilized gardens in pedagogical instruction in significant and

sustained ways, with the notable exception of the Learning Garden at UBC Okanagan (The University of British Columbia, n.d.) or the Orchard Garden and the Cultivating Learning Network at The University of British Columbia (n.d.). Additional linkages to faculties of education exist elsewhere, such as alternative placements at the Learning Garden at Ecology Park through Trent University (n.d.) or the Learning Garden at OISE at the University of Toronto (n.d.).

Within Ontario, certified teachers are required to attain a professional degree known as a Bachelor of Education or Diploma of Education (for teachers of technical subjects). In all cases, they must attend and graduate from a recognized faculty of education, including a supervised training portion. Post-secondary institutions, especially those with faculties of education like Lakehead are ideal sites for the development of GBL programs that can serve to support pre-service teachers beginning their teaching careers (Burns & Miller, 2012; Campigotto et al. 2022). For example, the Lane Middle School Garden-Based Education program at the Learning Gardens Lab located at Portland State University provides land and support for a program embedded within a neighbouring elementary school (Burns & Miller, 2012). Post-secondary institutions may support GBL programs in their communities by making land available, program support through student placements, conducting GBL related research, cultivating curriculum, resources, and community and partnership development between local schools and programs.

While Lakehead Orillia offers required B.Ed. courses in GBL friendly fields such as Environmental Education, Indigenous Education, and Social Studies, there are no specific in depth opportunities for education students to dig in, other than that which is offered by our student club called Lakehead Farm Club. While various course instructors for these classes and others (like Environmental Education, Democracy and Education) have made attempts to

integrate GBL concepts, field trips and approaches, this is not their main or explicit focus. Thus, it would be possible for a teacher candidate to experience two professional years in the B.Ed. program and graduate without ever hearing the words “garden-based learning”, make the historical connection between kindergarten and actual gardens, or be confident to start or engage a GBL program once they begin teaching. Campigotto et al. (2022) recently explored the potential for integrating food literacy programming within pre-serving teacher training in Ontario, as a bridge to making environmental education more relevant and accessible for new teachers. Campigotto et al. (2022) identified a clear interest among pre-service teachers in learning more about food literacy but acknowledged that a cultural shift is necessary within faculties of education. Towards this culture shift, faculties of education could develop and offer elective courses that focus explicitly on food literacy, including GBL. They can integrate GBL more regularly within required courses, advocate for the creation of a food literacy and or GBL additional qualification (AQ) to offer to existing teachers and provide diverse opportunities for teacher candidates to complete their supervised teaching portion of their degree with a GBL program and experienced mentor. Considering the addition of food literacy expectations within the new Ontario curriculum, it is reasonable to expect that food literacy and GBL by extension should play a larger role within faculties of education.

As noted, post-secondary institutions within Canada showcase a wide array of GBL programs, and often, numerous examples within the same institution such as I experienced at both Lakehead Orillia and the University of Toronto. According to Slotnick (2010) the goal of such potentially transformative projects is to “provide an experience of sustainability, a palpable sense of being bonded to a place and a group”. Many of the same benefits exist for students in post-secondary GBL programs as for younger students. Such projects are used to teach many

different subjects, like agriculture, sciences and interdisciplinary studies. They are also used to promote Indigenous and other cultures, student connectedness and wellbeing, or even for the benefit of employees like the new Employee Community Garden at Queen's University (2022) among other foci. Post-secondary institutions due to their unique calendars typically notice a migration of students off campus in the spring from May-August, creating an even bigger gap of student presence than is experienced by elementary schools whose students are gone from July-August. Laycock-Pedersen et al. (2019) has performed an extensive study of the phenomenon of transience in student growing programs and issued a collection of recommendations for improvement, such as involving more deeply rooted participants like student unions and staff.

Municipalities

Municipal governments have a key role to play in establishing a supportive environment in which a diversity of GBL programs and organizations can thrive. Municipalities are in charge of local land-use planning, determining allowances for GBL related structures, but more importantly protecting agricultural lands near to urban areas for GBL programs. Municipalities are themselves often the largest landowners within each community, possessing and managing a network of parks and other public spaces upon which GBL programs may take place like community gardens, community greenhouses, or urban farms. In his book *Food For City Building*, Wayne Roberts, an inspiration of mine and many in the food movement, presents in great detail the role of food systems, including food production towards remedying a host of urban ills (Roberts, 2014). One participant in our study cited Wayne during their interview as he once told them the solution to the summer question was that “school gardens are curriculum based from September to June and they’re a civic responsibility in July and August.” Municipalities have been noted to form partnerships with local schools and non-profits, to

provide resources such as water, compost and other synergies with municipal infrastructure, personnel (like horticulture staff) and programs, like school garden summer camps (Johnston, 2014) and opportunities for youth and seniors. Seed libraries, often located within public libraries, also support school gardens and GBL programs by making seeds and seed literacy freely available.

Food Policy Groups

Food policy groups, typically acting within municipal or regional jurisdictions, bring together food system actors across sectors, through “participatory governance mechanisms” (Levkoe et al., 2021), to discuss, develop and advocate for sustainable, local food policies and projects. It was the Growing Orillia’s Food Future Report (Growing Orillia’s Food Future, 2013), that first corralled local food security organizations and proponents, including emergency food programs, community gardeners, health professionals, educators and youth to begin envisioning a network of school gardens around our community to promote food literacy, a common goal of food policy groups. Such groups can provide a wide range of support and benefits to GBL programs, through networking, resource sharing and advocacy. For example, through the Simcoe County Food Council (n.d), I am an active member of the food literacy working table - this provides a near monthly meetup of diverse players within local educational institutions and food literacy proponents, like school gardeners. Going further, such food policy groups would benefit from encouraging youth leadership platforms, such as what I experienced with the Toronto Youth Food Policy Council (n.d.), the first of its kind where youth can learn how to advocate for their own interests.

Public Health Departments

Public health departments have shown a key interest in supporting GBL programs as successful public health interventions to encourage healthy lifestyles including improved diet and exercise (Chan et al., 2022). Public health organizations can be vocal advocates for GBL programs and provide critical evidence, as well as resources to support GBL programs, such as how-to guides, nutrition and other health promotion related activities. While beyond the scope of many health programs, the connection between mental health and school gardens could benefit from greater focus in the future. While GBL interventions have shown moderate success in promoting health through increased healthy food knowledge and skills, they do not substantially increase healthy food intake Chan et al. (2022). Chan et al. (2022) recommends utilizing more multidisciplinary approaches involving teachers, parents and community members to increase their overall health benefits, such as integrating both growing and cooking programs and across subject areas.

Ministry of Education, Curriculum and Educational Policy

It is evident how provincial curriculum documents including specific statements and expectations can create the conditions for GBL programs and permission for educators to focus on these approaches. In Ontario, for example, the new Science and Technology K-8 curriculum, updated in 2022, now includes numerous references to food literacy, including expectations well suited to GBL programs. Other subjects in the curriculum could easily be edited to include opportunities for GBL as is evident from the wide range of subjects connected to GBL such as literacy (Parsons, 1910; Pascoe & Wyatt-Smith, 2013) and many more (Williams and Dixon, 2013). GBL however should be understood as a holistic approach to education, and gardens seen as interactive and living classrooms that can animate any subject matter (Green, M., 2008, p. 15). Provincial funding for purpose built facilities, local farm to cafeteria programs (Farm to

Cafeteria Canada, 2019), and specifically trained educators and resources could support schools who wish to integrate these programs but may lack the resources, infrastructure or personnel to implement them. For example, expecting teachers to integrate food literacy into their classrooms, without providing spaces to grow or cook food (like gardens and kitchens) or opportunities for professional development impoverishes students' learning environment and undermines stated learning objectives. Finally, food literacy and GBL programs are often ostensibly motivated by concerns about health and food security but fail this objective if not paired with broader food systems and cultural shifts which guarantee the right to food for all people, especially students in schools. Just as one participant said that it is hard to learn when you're sad - so too is it difficult to learn when you're hungry.

Individual Schools

GBL programs tend to exist within formal educational institutions like schools. Existing as a community, successful GBL programs tend to experience widespread community support and are integrated within various aspects of the school environment and curriculum. For example, schools may consider supporting a garden club or committee to govern the program, ensuring representation from students, teachers, staff, admin, parents and community members. Having a clear plan, schedule, signage and communications (like website, announcements, posters, etc.) about the garden and what it is for and how to participate, will help to ensure engagement. Signage can create opportunities to integrate art and student engagement and ownership. Integrate the garden within other programs, such as a seed library, an offsite garden/farm for more extensive field trips, a greenhouse, indoor growing space, or a culinary program that can extend the learning throughout the fall and winter months, which often offer less opportunities than the spring and summer.

Far too often schools return in the fall and gardens are overgrown and overlooked, seen as a spring thing. The experiences expressed amongst participants revealed a potentially significant gap in fall programming for GBL initiatives, compared to spring initiatives. A focus on fall and winter would benefit GBL programs in order to complete the cycle initiated every spring bringing programs full circle from seed to harvest to seed again. Starting fresh with store bought seeds is just not the same as students growing seeds they've grown and saved themselves the previous season.

Administrators, Trustees & School Boards

As leaders within educational institutions, authorities like vice principals, principals, superintendents, and elected trustees play a pivotal role in shaping the policy, procedural and evaluative frameworks in which GBL programs may exist and thrive. Interviewees spoke about the support they received or would like to receive from their own principals in experimenting with GBL programs at their schools and how a lack of support can frustrate their initiatives - leading to a waste of energy and resources (Hoover et al., 2021). Elected trustees are in a unique position to advocate and implement school garden policies, protocols (Vancouver School District, 2018) and permanent funding sources, like those that exist in some jurisdictions, which can positively affect entire districts and school boards making it easier for individual teachers and schools to create successful and long lasting GBL programs. Within Simcoe County, Ontario, as a GBE, I am not even familiar with all the currently existing programs as no such map or registry exists despite existing similar recommendations (Eco-Ethnomics, 2019). School boards should have a map and track existing initiatives which can help support them over time, by enabling communication, networking, and PD opportunities. Finally, administrators are responsible for ensuring a transparent system for reviewing and evaluating the success of GBL

programs within their jurisdictions. Having clear and relevant assessment criteria is essential to establishing a successful program (Burt et al., 2017; Diaz et al., 2018).

Teachers

Haase (2020) detailed the work of Growing Up Organic, an organization that supports 50 school gardens in the Ottawa area noting that in order for them to partner with schools they require at least 3 teachers to commit to the program. As passionate as individual educators may be, they should consider resisting the urge to go it alone, instead taking more time to build buy-in and collaborative relationships with their peers before launching a garden-based learning program. GBE interviewed noted specifically the value of peer-peer relationships they have with their fellow teachers and the importance of building professional communities of active practitioners. This collaboration is often key to the long term resilience and success of GBL programs, by facilitating broad-based support and strategic planning to avoid common pitfalls (Yu, 2012).

Enterprising teachers may consider advocating towards the creation of more dedicated positions within their jurisdictions such as full or part time garden educators. Often it is through partnerships like the one between City Sprouts and schools around Boston (Hirschi, 2015), which sees a professional Garden Educator hired one day each week during the year to ensure the school garden is planted and maintained. Ideally, such a position may be sourced from qualified teachers within the school board, so as not to be dependent on externally funded or motivated organizations.

Parents

Parents have been noted as instigators and supporters of GBL programs at their children's schools and guides have been created with them in mind (Friesen, 2011). The story of the

creation of City Sprouts (Hirschi, 2015), an organization in Boston that supports illustrates how one parent's passion for school gardens can snowball and evolve into a city-wide initiative involving over 20 schools and hundreds of classrooms. More than instigators, parents, as key constituents within the school community, are often invited to donate their time, resources, or skills in the creation of the garden infrastructure, such as building raised beds or distributing compost and other heavier tasks required. Parents can also be counted on to provide ongoing support, especially after school or throughout the summer when school is closed.

There is a difference between parental involvement and parental engagement (Heinrichs, 2018), the former considers parents as just volunteers, the latter conceptualizing parents more as co-educators. It is well established that individual parents and caregivers, parent councils, committees and the like, can be valuable partners in supporting student success in schools (Ippolito, 2012), especially among marginalized communities. Cultural events like gardening and food sharing in particular (Ippolito, 2012) can provide a platform for meaningful parental engagement that transcends the classroom by engaging families outside of class-time, including after school, weekends and during summer vacation. By engaging parents, caregivers, and families in GBL programs, like participating in school garden committees or garden at home opportunities, success and benefits to students may be multiplied and extended further - especially in changing food consumption behaviours (Schreinemachers et al., 2020) a stated goal of many health motivated GBL programs.

Students

Students are the centre of learning and play starring roles within GBL programs. Every aspect of the GBL program including its physical design (Wake, 2008) represents a learning opportunity for students - not just that which they experience during class time - but how they

interact with the garden before and after school, at recess, during summer or beyond. Students should be encouraged to form their own garden clubs and projects. Students should be guided by the principles of starting small to ensure early success, self confidence and momentum towards bigger projects. By leading, learners gather a greater diversity and share of the harvests.

Third-party organizations

There are in many communities third party organizations, from the non-profit and for profit spheres that are all too eager to gain access to mouldable minds within schools by offering GBL and related programs. Where teachers and schools lack the knowledge and resources to deliver these programs, third party organizations may be counted on to step in so that such opportunities and their benefits are made available to students. Horticultural societies and Master Gardeners exist in hundreds of communities which provide free horticultural related knowledge and resources, as do conservation authorities, especially relating to ecosystem restoration. EcoSchools (n.d.) is another which offers support and certification for schools who engage in various ecological activities including composting, gardening. A more extensive list of such organizations can be found in our resources section. Our study revealed some hesitation among teachers for involving third party organizations, who come with their own agendas that may or may not align with that of the schools. Even one of our participants who founded and leads such a third party group which partners in school garden programming, advocates for publicly funded and delivered programs, as to ensure quality, universality and sustainability. Should we expect math education to be dependent on the goodwill of third party organizations? If involving third parties it is recommended to ensure adequate opportunities for capacity building among the host institution, teachers and students alike, so that such programs do not become overly dependent on external support but can be sustained on their own like any other core school program.

Summary of Discussion

All the research participants and garden-based educators surveyed themselves experienced formative learning opportunities in nature and gardens as children. Their strong belief in the value of GBL led each of these practitioners to become advocate-educators, or champions as they are often referred to. As Canada's and the world's population becomes increasingly urbanized and alienated from traditional food systems (Hayden-Smith, 2006), informal and formal opportunities for outdoor education become increasingly limited. To what extent this lack of exposure to outdoor and garden-based education has on aspiring teachers remains to be seen. Future research directly questioning pre-service teachers without backgrounds in garden-based education would help to better understand the barriers preventing a wider adoption of GBL programs, than simply speaking to the converted.

When it comes to defining the success of GBL, or its fundamental purpose, the educators interviewed provided a range of motivations comprising both teacher-led and student-led goals. While the educators interviewed more commonly cited cultivating joy as their primary goal, it is fair to say that generally, these educators desired to engage their students in more meaningful ways. These educators believed that the garden could cultivate a positive emotional connection between their students, each other, and their learning environment. The GBEs interviewed all shared a belief that the garden was an exceptional approach to achieving the provincially stated purpose of education, despite many sidelining curriculum expectations for what they considered to be more important life lessons. According to the Education Act (n.d.) "the purpose of education is to provide students with the opportunity to realize their potential and develop into highly skilled, knowledgeable, caring citizens who contribute to their society." While not explicitly mentioned by most participants, this ethic of care is implied in the act of gardening, as

far as it is ostensibly about the cultivation of plant life, requiring skills, knowledge and care for other living beings in order to be successful. Fundamentally, however, GBL is about cultivating the learner. It was evident that for GBL to succeed on a larger scale and be sustained long enough for its known benefits to accrue across the whole of society, clearer consensus based, and critical outcomes need to be well established prior to the design and implementation of programs, along with procedures for continual feedback and improvement.

Participants spoke candidly about their experiences growing up as garden-based educators and the types of support they have enjoyed and that which they desire. However, only one spoke of an experience during their pre-service teacher training directly connected to GBL, most others spoke how little that training provided them for their current role. One spoke passionately about their experiences and the need for more resources and support for pre-service and experienced teachers and their work to remedy this need. It was encouraging to see others identify this gap and make significant strides to bridge it. It was my intention through this research to help consolidate gains and continue to water and fertilize the movement to continue growing and evolving. Successful and sustainable GBL initiatives can not rely on the passionate and individual expertise of a single self-taught teacher but depend on a diverse ecosystem of individuals and organizations described above. Most significantly I proposed that faculties of education, as centers for educational research and development, and the formal training ground of every new crop of teachers, are essential institutions that ought to serve as foundational pillars within GBL ecosystems. This can be achieved through the establishment of exceptional demonstration farms and gardens to teach the teachers and to support the whole community.

Chapter 6: Conclusion

This final chapter reveals the competing interests operating in this space and the need for critical food literacy and evidence-based decision making when it comes to developing policy and programs. From there, it will recapture the focus of this research and findings, pointing to the way to fertile futures for garden-based educators and learners alike.

Contested Space

Gardening can be simple and complex but initiating a series of changes to education and culture that would make space for GBL and critical food literacy, seems exhaustingly complicated. While school-based educators and their allies in community, university and elsewhere discuss the possibility and potential for GBL, some corporate-backed organizations are emerging to colonize this space. For example, AgSpace, an Ontario based charity focused on agriculture and food education for schools, and the provincial member of the national group Agriculture in the Classroom-Canada, launched a collection of free seminars in the Fall of 2022 to provide professional development opportunities for current and aspiring teachers (AgScape, 2022). Acting as an educational arm of many industry-led organizations, it is a strategic focus of the organization to normalize and justify industry practices, promote careers in, and the goals of, the agri-food industry (AgScape, 2022).

According to its website, AgSpace (n.d.) offers “factual, balanced, curriculum-linked food literacy programs and resources to Ontario's educators and students.” The fact that they must preface their offerings as factual and balanced speaks to the politically contested nature of food and agricultural education in classrooms today. This contest was recently seen in the political debate surrounding the revamped and influential Canada Food Guide (CBC, 2019), which eliminated the concept of food groups, like dairy, and elevated the importance of whole

foods and plant based food and proteins over meat based proteins, to the protests of the dairy and other major industry groups. What criteria (Weldon & Parkhurst, 2022) have these organizations used to determine what is balanced and factual information? The Canada Food Guide, like resources produced by AgSpace, are infused with values and goals that are not necessarily in our best interests. Critical food literacy requires us to question the source and whether they are in the best interests of learners or are in fact evidence based. Returning to the central themes of this thesis with some urgency, it is important that educational programs are informed by critical food literacy and evidence-based practices.

Recapping Research Question & Purpose

This research set out to probe the phenomenon of GBL from the perspective of educators, asking the question, how can support for educators influence the success of garden-based learning. This question carried with it two primary inquiries: how do educators define success and how can support for them support that success?

Why this research is important

During this research study, we have witnessed significant global crises events that continue to drive interest in GBL, similar to historical waves of interest in educational gardens. These events include an ongoing global pandemic that has disrupted many systems including healthcare and education, intensifying war in Europe, a housing and affordability crisis and the highest inflation in over 40 years (including food inflation). These events are on top of existential threats posed by climate change and ecological collapse and continuing social inequalities and instability. As concern over sustainable food systems increases, so too does attention towards food and agricultural education, and by extension, garden-based learning. This increasing focus is evidenced by the addition of food literacy expectations to the Ontario k-8 science and

technology curriculum in 2022 (Ontario Education, 2022). Within this context, there is an identifiable gap in the preparedness of educators to both define and deliver successful food literacy and GBL programs for those they serve. This lack of preparedness results in conflicting goals, a potential waste of energy, resources and off putting failures. It is thought that through learning how to define success we can support successful programs that achieve their stated goals and serve as models to inspire and propagate future programs.

Research methodology and limitations

I explored the unique motivations and experiences of garden based educators across a variety of jurisdictions, and educational settings through eight semi-structured interviews. This research aimed to describe the phenomenon of garden-based learning from the perspectives of educators. In addition, I sought to critically examine the meaning of success, map out and make recommendations to transform the existing ecosystem of support for garden-based educators. Towards this end and to better understand the research participants, a series of questions were posed to them. Questions focused on their background and current practice, their conceptions of success and how they measure it, along with what supports they have and would like to have and why this additional support would be beneficial towards their success. This study was limited from its original scope due to Covid-19 restrictions, which sought to include in person and site visits to local educational gardens, along with a focus group to initiate the start of a local professional learning community. This study was further limited by a small pool of participants from diverse backgrounds, thus making generalizing difficult. Further research on this subject may hone in on more specific forms of GBL, such as that which occurs in public schools in primary grades, or other particular grade levels or settings, like Indigenous communities or post-secondary institutions. Future research may take a more expansive look involving a much larger

pool of participants, to be able to distill more essential features of what forms of support and teacher preparation make for successful programs generally.

While I had entered this research inspired and motivated by a particularly political and transformative agenda, I recognize that the overall methodological approach of this research did not allow that to flourish. Instead, the research reflected what might be called by some an uncritical and individualized approach to knowledge generation. As noted, more conventional, and perhaps, apolitical methods of inquiry were deployed, mainly individual qualitative interviews that posed relatively simple questions. Given that I relied for quality control more on the activist integrity of my interviewees than on a more complex set of questions, my inexperience as an interviewer left many threads hanging. While other perhaps more emancipatory and community-engaged methods were envisioned, they were shelved in part due to the unexpected uncertainties prompted by the pandemic, and also due to the nature and limitations of being a student-farmer and not a seasoned researcher.

Furthermore, the desire to move quickly through the thesis approval process in order to attain greater institutional legitimacy to advance the original cause, which is itself evidently transformational, motivated a more traditional and conventional research approach. (In fact, I have since qualified for entry into a Ph.D. program). Upon reflection, I believe the barriers to realizing the liberatory potential of GBL go far beyond what is presented here and that future research, if it is to inform a transformative program, must consider more ecological, community-based, democratic, and participatory approaches to knowledge building and action.

Concluding thoughts about the potential of GBL to transform education

Participants at times spoke of their strongly held beliefs in the power of GBL to transform their students into better humans. At other times, they lamented and expressed

frustration at the lack of support they've encountered from their administration and the system in general, doubting that they will see such transformations in their own lifetimes. If GBL is to be as liberatory as its proponents believe it be - freeing students from the constraints imposed upon them by the four walls of the standardized classroom - it is essential that these four walls aren't simply replaced by the borders of a raised bed garden, or a fenced in plot. Learning from an Indigenous conception of gardens and gardening, involving the cultivation of our whole environment (Stroink et al., 2010), we can see opportunity for GBL everywhere - the schoolyard, neighbourhood, backyards, lakes, rivers, forest and fields, outdoors and in, winters too.

When formulating concluding thoughts, the popular Online Writing Lab at Purdue University suggests, somewhat facetiously, that one does not "try to solve world hunger in the final sentence of your conclusion" (Purdue University, n.d.), yet here we are. In all seriousness, hunger, social instability, ecological collapse, are pressing and intersecting world issues today that demand serious attention. This thesis has taken aim at a minor yet significant component, namely, the role of garden-based education in promoting solutions to these ever-imposing multifaceted problems. Popular pedagogues throughout history have not been shy to proselytize the values and virtues of a well rounded garden-based education. According to Schwab

That the little pamphlet appeared in its second edition at the Vienna Exposition, and that a fourth is now called for, and that the author has received invitations from foreign countries to pronounce discourses upon the subject, is a proof that at present everywhere the school garden is recognized as the most important foundation of society, and that a good thought, advocated with perseverance, has not to wait long for general co-operation. (1879, p.13).

By the turn of the last century, Hemenway (1903) estimated that there were over one hundred thousand school gardens in Europe alone, as he and a growing school garden movement advocated for one at every school in America. Let's continue to imagine a school in every garden and a garden in every school.

Thesis Epilogue

Before embarking on this thesis, I did not know of the works of Schwab, or of Fröbel's first Kindergarten, or Epicurus' Garden School, the United States School Garden Army, the horrors of residential schools and forced farm labour, or of the countless others who have dug in here before. I knew that learning how to grow food and cultivate a bountiful and beautiful environment was something I felt was inherently important, essential even. The more people I shared the idea with the more I found those who wholeheartedly agreed. Yet despite the near unanimous consensus that "children learning how to grow healthy food is a good thing" we do not see nearly enough of it. In our schools, too often children go not only without this basic life knowledge, but they go without food itself, suffering immensely due to such remarkably preventable deprivation. Where teachers or others seek to intervene in this criminal enterprise, they find too many barriers that too often precipitate failure and weeds - figuratively and literally - and not necessarily the useful, edible, medicinal kind, more like the stubborn, invasive, and thorny types that makes everything else struggle to grow. Educators and learners ought not to be Garden-Sisyphuses, doomed to forever weed their gardens for that is not sustainable - they need to harvest what they have sown. By focusing on improving their foundational experiences, knowledge and skills, while cultivating a supportive policy and professional environment, we can reduce the weeds they must pull so they can enjoy the bountiful fruits of their labour. Future generations will be better off for it.

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List of Tables

Table 1.

Who taught the teachers?

GBE	<u>Parent (s)</u>	<u>Grandparent (s) / Other</u>	<u>Job</u>	<u>Informal Learning</u>	<u>Certification</u>
B	Mom, Dad.	-	-	Inspired by west-coast gardening author Linda Gilkeson.	Master Gardener Certificate
C	-	-	Worked & volunteered on organic farms and community gardens.	Self-taught as a child / Garden as teacher. Inspired by Phoebe Dunbar, local community food organizer.	Permaculture Design Course (through Oregon State University).
D	Mom	Grandparents / Aunt	Worked on organic farms.	Inspired by popular market gardener/farmers/ authors: Jean-Martin Fortier & Curtis Stone. Influenced by books (Hervé Gruyer, 2016; Mollison, 1994).	-
E	Parents, Dad	-	-	-	Horticulture Certificate
F	Mom, Family Farm	-	-	As an adult - learning on the internet	-
G	Mom	-	-	Professional Learning Community of Garden-Based Educators, "The Land."	Master Gardener Certificate
H	-	Grandmother	Started landscaping company, worked on CSA farms	-	-

J	-	Grandmother	-	-	Master Gardener Certificate (via US Master Gardener program)
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Table 2.*Current Role as Garden-Based Educator.*

GBE	Educator (Public)	Garden-Educator (Public)	Non Profit	Educator (Private School)
B	-	Outdoor Classroom and School Gardening Teacher (Elementary)	-	-
C	-	-	-	Independent School Educator (Pre-K to Gr.8)
D	Classroom teacher (Elementary)	-	-	-
E	-	-	Executive Director	-
F	Experiential Teacher / Vice Principal (Elementary)	-	-	-
G	-	Part-time Outdoor Classroom and School Gardening Teacher (Elementary) / Educational Consultant/Research	-	-
H	Classroom teacher (Elementary)	-	-	-
J	-	-	Program Coordinator	-

Table 3.*GBL Primary/Secondary Goals.*

GBE	Joy	Nature Connection & Stewardship	Horti-cultural Skills	Academic/ Curriculum	Health & Well Being	Other
B	1	2	-	-	2	-
C	-	2	2	2	2	1: "Student Engagement & Curiosity"
D	1	2	2	-	2	2: "Economic Self Sufficiency"
E	2	1	2	2	2	2: Teamwork. "Fostering empathy/ caring". "...tremendous impact on their sense of agency."
F	2	2	2	-	2	1: "Student-Centered Goals"
G	1	2	-	2	2	2: Building healthy relationships to place, each other. Gardens well utilized by all teachers.
H	1	-	-	2	2	2: Successful program is "Sustainable"
J	-	-	1	-	-	2: Self-confidence, Relationship building between participants (Indigenous / Non Indigenous), the Land/Gardens/Community

Note. 1= Main, 2=Secondary.

Table 4.*What does success look like and how do you measure it?*

GBE	Student Feedback (Verbal/ Written)	Parent Feedback	Food Production	Other
B	Students attentive, having fun, laughing, smiling, happy, talking about it afterwards.	-	-	Photos and Video. Feedback from other teachers.
C	Student engagement. Establishing benchmarks based on Ontario curriculum (social studies, environmental citizenship streams.)	-	-	Programs engage full cycle: planting, harvesting, cooking.
D	Student engagement. Happiness Survey for students (does not exist but proposed it).	“parents say they really love it”	“people feeding themselves, their communities”	Food Behavioural changes at home and in the community (with policy changes), Carbon/Environmental Impacts
E	Students of the program returning to work for the organization in the future.	-	Depends on goals. Food produced “actually” feeds students/families.	Students more likely to try new foods. “Repeat customers” - teachers return to the program.
F	Students preparing learning goals ahead of time, checking when complete. Likert Scale 1-5 based on self-assessment, teacher observations.	Heard from parents how it impacted children.	If that’s the need/goal set by students.	-
G	Garden is joyfully utilized by students and teachers.	-	Explicitly not a measure of success.	-
H	Verbal questions for students, Written assessments, drawings.	-	-	Triangulate data, successful programs have all the resources they need. Support is success.

GBE	Student Feedback (Verbal/ Written)	Parent Feedback	Food Production	Other
J	Student feedback, expressed throughout program duration including outgoing surveys, quantitative (lbs produced, \$ income) qualitative (experiences of participants).	-	“...we track the amount of food that we grew by weight.”	-

Table 5.*Existing Avenues of Support.*

GBE	Formal Teacher Training (B.Ed.)	Ongoing Professional Development (PD) (Workshops, PD Days, Professional Learning Community (PLC), etc...)	Trial & Error (TE) / In Person Community	Online	Internal Org. Support	External Funding / Other
B	B. Ed., not relevant.	PLC. Master Gardener Course.	TE (via gardening clubs; Botanical Gardens, ecology groups)	-	Supportive colleagues, principal, policy.	Funding, Kits
C	No B.Ed. Degree in Env. Studies	Permaculture Design, Food and Environment Course	TE, Community gardens.	Curriculum resources.	-	Funds for infrastructure
D	B.Ed., not relevant.	PLC (google group)	TE, books, local community garden groups.	-	Noted lack of support, except small boxes.	
E	No B.Ed.	Facilitated Teacher Training. See “Resources” for list of affiliated working groups.	TE, networking with other Toronto groups.	“SGSO” - Google Group, archived webinars.	Very supportive board of directors.	Canada Summer Jobs. Aboriginal education center @ TDSB
F	B.Ed., M.Ed. exp. ed. applied to GBL.	Partnership with a local GBE/Farmer.	TE.	GBL resources online	Student Success program for at risk youth, exp. farm trips. Unpredictable support.	Grants for exp. education through school board. Green Apple Grant.
G	B.Ed., not	Master Gardener training. PLC.	TE.	Extensive network of	District piloted fully	Grants for infrastructure

GBE	Formal Teacher Training (B.Ed.)	Ongoing Professional Development (PD) (Workshops, PD Days, Professional Learning Community (PLC), etc...)	Trial & Error (TE) / In Person Community	Online	Internal Org. Support	External Funding / Other
	relevant. PhD student in Ed.	Offers professional GBL training and resources for teachers. Job-share with fellow GBE.		online links (web & twitter).	outdoor garden - teacher position. PAC funding.	, resources. See “Resources” section for list of funders.
H	B.Ed., not relevant.	Doesn't attend on weekends, suggesting they are not valued by the School Board.	TE. As a consultant & landscaper, from parents and private businesses, it is easier in a small town.	-	Admin. could be more supportive. School board out of touch.	Grants easy to access.
J	B.Ed. special garden project.	Attended two conferences on Land-Based Learning, GBE. University of Saskatoon's Master Gardener Program.	TE. Backyard garden, tours, community gardens. City-wide gardening/urban space committee. Local food bank, seed companies. Seeds of Diversity. U of S programs.	Facebook groups (see Resources for list).	Support with admin, HR, PR, funding.	Canada Summer Jobs grant

Note: See “Resources” section for a listing of these and other resources.

Table 6.*Support Desired.*

GBE	Dedicated Garden Educators	Funding/Resources	Kits	Professional Development	Admin/ Staff/ Community Support
B	Designated school garden teacher / consultant (district-wide).	School garden start-up fund. Funding for ongoing GBL supplies.	Learning kits for related subjects, outdoor learning.	PD days focused on GBL/outdoor education.	Garden at every school.
C	-	Bursary for training Garden-based educators. More paid hours in gardens, capital funding for building projects.	-	Special training for GBE and nutrition training.	-
D	Partnering with local farmers and gardeners to host field trips/support teachers.	Prov. funds to share knowledge between farmers/ gardeners and local schools/communities including field trips at local farms. Make land more accessible for these programs.	A bank / booklet of curriculum inspired lesson plans.	An active and local professional learning community.	Protocol/ Policy in place to support school gardens, simple garden application form.
E	School garden teacher / consultant (district-wide). "Itinerant Garden Educator". Having low GBE - Student ratios so every child can experience the garden (not waiting in line).	Funding for transportation to farms/off school gardens. Funding from the school board to scale the program. Relationship building and then funding for Indigenous Elders. Publicly (Municipal) funded GBL programs.	-	More Indigenous and climate change content.	Garden at every school.
F	School garden teacher / consultant	Grants to support exp. GBL (especially	Curriculum based GBL	Gardening logistics (crop	More partnership

GBE	Dedicated Garden Educators	Funding/Resources	Kits	Professional Development	Admin/ Staff/ Community Support
	(district-wide).	for field trips to inspiring farms/gardens).	kits to support teacher adoption of programming.	planning) for successful harvests (don't want kids to only exp. loss). More engaged colleagues.	opportunities.
G	School garden teacher / consultant (district-wide).	Irrigation (especially for summer).	Kits coordinated by a district resource person.	Better understanding risky play (ex. through risk-benefit analyses).	Community support for summer - takes time to build an ethic of care.
H	Integrate GBL through roles such as a planning time / health teacher.	Sturdy shed that can't be vandalized.	-	PD during school hours (teachers compensated - not out of pocket).	Admin should be more interested in the educational aspects (if not interested in gardening).
J	-	-	Curriculum based garden education kits.	Focus on building confidence/ not necessarily garden-related knowledge.	Inter-prov. networking, virtual knowledge exchange. Dedicated core group of at least 4 people.

Resources

NOTE: This is not an exhaustive list of resources - merely a list of resources, loosely organized, uncovered during interviews and additional research.

Funding Sources

- TD Friends of the Environment
- Whole Kids Foundation
- Learning for a Sustainable Future - Action Project Funding
- West Coast Seeds - Seed Donation Program
- Canada Summer Jobs
- Green Apple Grant (Metro)
- Nutrients For Life

School Garden Resources, How to Guides, Best Practices, Activities and Lesson Plans

- Educational Food Landscapes: Developing Design Guidelines for School Gardens - Elizabeth Nowatschin's Master of Landscape Architecture thesis (2014)
- Nutrients For Life. (2022). *Learning Gardens: A Guide for Canadian educators, 2022 Edition*. <https://nutrientsforlife.ca/pdf/learning-gardens-manual.pdf>
- Agriculture in the Classroom Canada - Curriculum Linked Resources
- Community Garden Council of Waterloo Region - Scan and Overview of School Gardens
- Just Food: An open-access educational resource for integrating agriculture, food systems, and anti-oppression into K–12 curriculum (via BC Teachers Federation)
- Just Food Educational Resource - <https://justfood.landfood.ubc.ca/>
- Ontario Edible Education Network Action Plan (Sustain Ontario)
- FAO - Setting up and running a school garden: A MANUAL FOR TEACHERS, PARENTS AND COMMUNITIES
- Eartheasy. (n.d). *How to Start a School Garden: Your Complete Guide*.
- SPEC'S School Garden Start-up Guide (Society Promoting Environmental Conservation, BC)

- [A year of school food garden activities](#) via Evergreen
- Curated [list](#) of school garden resources by the Vancouver School Board
- [A Guide to School Gardens](#) - Durham Region Health Department
- Getting Started with Garden-Based Learning: [An Introductory Guide](#) for Program Leaders/Educators (Cornell University)
- Life Lab - [An Extensive Collection](#) of School Garden Resources etc.
- Growing School and Youth Gardens in New York City: [A Guide to Resources](#) (2009)
- [Start A School Food Garden](#) - via Healthy Eating at School
- [GARDENING ACTIVITY GUIDE](#) - Natural Learning Initiative, NC State University
- [Virtual Programs](#) - Michigan State University
- [Example](#) of a 4-acre Children's Garden
- [Growing Schools](#) - LifeCycles, Victoria BC
- [Edible Schoolyard Project](#)
- [The Greenhouse](#) is your one stop shop for school garden activities & curriculum from Big Green, our partners, & beyond.
- [Kids Gardening \(Vermont\) Lesson Plans, Activities](#)
- Food, Mathematics, and Science Teaching Enhancement [Resource](#)
- Collective School Garden Network (CSGN) [Curriculum Resources](#)
- [The Food Project](#) - [Collection of Manuals](#) for Youth Agriculture Programs
- FoodShare Toronto - Youth Written Curriculum ([Webinar Series](#)), [Sample raised bed designs and budget](#)
- Planting Charts, Activities
 -
- Online Groups, Social Media accounts/influencers with free content
 - [Vegetable Academy](#) (Facebook)
 - [Needs and Yields](#) (Facebook)
 - Peer to Peer Support
 - <https://www.teacherspayteachers.com/>

- <https://community.kidsgardening.org/home>
- Garden Science Tech
 - <https://foldscope.com/>
- Collections of Historical Literature
 - Library of historical school garden texts >100 years old (University of Pennsylvania)
 - School Garden Collection of Resources >100 years old (Michigan State University)

Formal Teacher Training (B.Ed.)

- Programs / Courses
 - UBC Farm
 - OISE Community Learning Garden (UofT)
 -

Ongoing Professional Development

- Other Certifications
 - Master Gardeners
 - Master Gardeners of Ontario
 - Master Gardeners Association of British Columbia
 - Master Gardener Certificate from University of Saskatchewan
- Conferences / Workshops / Modules / Events
 - Life Lab - PD for Garden-Based Educators
- Professional Learning Communities
- Formal (membership)
 - Teachers Associations
 - Council of Outdoor Educators of Ontario (COEO)
 - Ontario Society for Environmental Educators (OSEE),
 - Columbia Basin Environmental Network (CBEEN)
 - Environmental Educators Provincial Specialist Association (EEPSA)
 - Cornell Garden-Based Learning
 - School Garden Support Organization Network (SGSO Network)
- Informal
 - Online Communities
 - Facebook Groups

Community Organizations & Networks (Canada)

- City-wide/Neighbourhood Community Non-Profit Groups

- GTA- <https://www.greenthumbsto.org/>
- Ottawa -Growing Up Organic is a garden based educational program for children and youth, delivered by COG OSO in the City of Ottawa. A part of the Ottawa School Food Network.
- Kingston - Loving Spoonful's GROW Project
- Victoria - <https://lifecyclesproject.ca/our-projects/growing-schools/>
- Provincial Groups
 - Ontario
 - Ontario Edible Education Network
 - BC
 - <https://spec.bc.ca/school-gardens/>
- National (Canadian)
 - Coalition for Healthy School Food
 - Seeds of Diversity
- Indigenous
 - <https://www.tdsb.on.ca/Community/Indigenous-Education>
 - Indigenous affiliated
 - <https://earthtotables.org/about/>
- International
 - USA, West Coast
 - “Collective School Garden Network” <http://www.csgn.org/steps>
 - Life Labs
 - City Sprouts - Boston
- Parent Council Groups
- Institutional Partnerships
 - Health Units, Municipalities
 - Saskatoon Compost Coaches
- Support (For-Profit)
 - GBL Educational Consultants
 - <https://theclassroomgardener.com/>
 - Edible / Landscape designers

Policy Statements

- Board policies
 - SCDSB Policy 2325 - Environmental Policy.
 - Development and Maintenance of School Food Gardens - Procedure Limestone School Board
 - DISTRICT GARDENS PROCESS - Vancouver School Board
- Board Guidelines
 - Richmond BC “Grounds Greening Guidelines”
 - School Food Garden Checklist - West Vancouver

- Board Statements
 - SCDSB “Environmental Initiatives”
- Provincial Policy/Statements
 - Nova Scotia
- National Food Policy Statements
 - Resetting the Table: A People's Food Policy for Canada (Food Secure Canada)

Appendices

Appendix A: Certificate of Completion for the Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans Course on Research Ethics (TCPS 2: CORE)



Appendix B: Invitation and informed consent form for interview

Jacob Kearey-Moreland, M.Ed. Candidate, Lakehead University, Orillia

Title of Research: Growing Garden-Based Educators

Information and Consent Letter for Educators

Hello,

My name is Jacob Kearey-Moreland and I am a Masters of Education student at Lakehead University (Orillia). I am currently engaged in my thesis research project looking at the influence of educator-supports on the success of garden-based learning (GBL). Of particular interest to me is your experience and perspective as a garden-based educator. In this context I invite you to participate in an in depth, semi-structured phone interview. Specifically, I want to know what kinds of support you have found (or wish to find) at all stages of your professional development and how these supports have defined and prepared you for success.

Your participation in this study is completely voluntary. Before agreeing to participate or not please carefully review this letter. If you have any study-related questions please let me know.

The purpose of this study is threefold:

1. As a requirement of the Master of Education program within the Social Justice specialization, I am compelled to conduct primary research and complete a thesis demonstrating my understanding and grasp of educational research, theory, and practice specifically relating to and advancing social justice.
2. To connect with, listen to and learn from local garden-based educators to illuminate and improve upon existing support systems to cultivate successful garden-based learning initiatives.
3. To produce research that is relevant, empowering and of benefit to participants and the wider community.

Method of Data Collection

The primary method for the collection of data is an in depth semi-structured phone interview.

Participation Details

Participation in the individual interview is expected to last approximately one hour. I plan to record the individual interviews so that I will be able to revisit all of the responses for analysis.

There is no financial incentive to participate in this research, however, I expect that you would see critical discussion of your practice and participation in a community of practice as a valuable incentive. I do not foresee any physical, financial, legal, or major social risks associated with your participation in this research. However, it is possible that there may be emotional or psychological risks involved with an in depth reflection of your role as a garden-based educator. Should you experience emotional or psychological injury during the interview I will be available afterwards if you would like to debrief further. If you would prefer to speak with someone else I would recommend you to the Catholic Family Services of Simcoe County, for a free single session, non-denominational counselling service in Orillia which you can contact at 705-726-2503.

I will not be using or asking to use participant names in the final presentations. Where necessary, pseudonyms may be used in place of actual names. Only myself and my supervisor will have access to the primary data gathered for this study, and I aim to provide confidentiality

at all times to the best of my ability. It is expected that identifying information shared within the context of the interview remains confidential.

I will store all original data including consent forms and transcripts I collect in a USB in a locked box, within the office of my supervisor, Dr. Michael Hoechsmann. The data will be stored for a minimum of 5 years following completion of the project. I plan to use this data for a research project that may enable future academic publications and presentations. Your identity will not align with any of the perspectives you provide for this research for any ensuing publications and/or presentations.

You do not have to participate, and are free to withdraw whenever without prejudice. You will face no negative consequences if you do not participate, or for providing negative responses. If you do not feel comfortable with a question during the interview, you do not have to answer it. If you would like to withdraw from this study at any time you may let me know in person, by e-mail, or by phone (see below).

Dissemination of findings

Upon completion of the research I will gladly email a copy of the final paper and any related production that includes your contributions, and invite you to a virtual presentation of the results, or depending upon public health restrictions, an in person presentation. The final paper will also be available digitally, for free public access through Lakehead University's Knowledge Commons.

This research is being supervised by Dr. Michael Hoechsmann who can be reached at mhoechsm@lakeheadu.ca or 1 (705) 330-4008 ext. 2640 . This study has been reviewed and approved by the Lakehead University Research Ethics Board. If you have any questions related to the ethics of the research and would like to speak to someone other than me, please contact Sue Wright at the Research Ethics Board at [807-343-8283](tel:807-343-8283) or research@lakeheadu.ca.

Please contact me if you have any further questions.

If you would like to confirm your participation in this study, please complete the attached Consent form and send it to me at kearey-morelandj@lakeheadu.ca.

Thanks for considering participating in this study, and for your on-growing work!

Jacob Kearey-Moreland,
M.Ed. Student,
Faculty of Education
Lakehead University, Orillia
1 Colborne Street West
Orillia, ON L3V 7X5
705-309-9669

kearey-morelandj@lakeheadu.ca

MY CONSENT

I agree to the following:

- I have read and understand the Information and Consent Letter
- I agree to participate
- I understand the risks and benefits to the study
- That I am a volunteer and can withdraw from the study at any time and may choose not to answer any question
- The data will be securely stored in the researcher's private laptop and/or a password protected google drive for at least 5 years following completion of the research project
- I understand that the research findings will be made available to me upon request
- The data I provide will be known to the researcher, but my identity will remain anonymous in any subsequent publications or presentations
- All of my questions have been answered

By consenting to participate, I have not waived any rights to legal recourse in the event of research-related harm.

Consent for individual interview:

I have read and agreed to the above information and by completing this form, I agree to participate in the individual interview portion of this research including the use of audio taping.

Name: _____

Signature: _____

Date: _____

Appendix C: Interview questionnaire template

Interview Questions for Garden-Based Educators

Interviewer: Jacob Kearey-Moreland

Note: (time in minutes) is listed in red font next to each section to give the interviewer a guide for how long each should take to cover all sections while keeping within the planned time frame.

Set up: On the date of the interview prepare a half hour early to ensure a private and quiet location for the phone interview. Test the microphone and audio recorder(s) ahead of time and before the interview to ensure they are working. Once the interviewee is ready, move to the **“Introduction Script”**.

Introduction Script (< 5): Hello and thank you for agreeing to participate in this interview! As outlined in the invitation, this interview is part of my Master of Education Research looking into *what ways can support for educators influence the success of garden-based learning (GBL)?*

This interview discussion should last less than 1 hour. You are free to take a break whenever you like or at any time end your participation. This interview will be recorded and transcribed for analysis. You are encouraged to answer honestly and fully and whichever questions you feel comfortable answering. Everything you say is meaningful for the purpose of this research. Do you have any questions before we begin?

Part 1. Context of Garden-based learning (15).

1. Do you consider yourself a garden-based educator?
 - a. Why not?
 - b. If so, how did you first begin to see yourself as such?
2. How would you describe your gardening experiences?
 - a. As a learner?
 - b. Who were your garden teachers?
 - c. And as an educator?
3. Can you describe any other examples of GBL you are familiar with?
 - a. How have these examples influenced your practice?
4. Describe your current role and responsibilities as a garden-based educator?
 - a. What is the garden like?
 - b. What are the students like?
 - c. What types of activities do you do with them in the garden?
 - d. How do you think the garden affects them?

Part 2. Defining Success? (15).

1. What do you consider to be your main goals as a garden-based educator?
 - a. What are some of your other goals?
2. What does success look like?
 - a. How do you measure success?

Part 3. Documenting Supports for Educators (20):

1. Describe the kinds of support you have received as a garden-based educator.
 - a. In formal teacher training?
 - b. Professional development?
 - c. Personal experience?
 - d. Community support?
 - e. Support from your organization?
 - f. Any other types of support you can think of?
2. How would you like to improve your practice as a garden-based educator?
 - a. What are your main challenges?
3. What kinds of support would you like access to as a garden-based educator?
 - a. Why would this support improve your success?
4. Do you have anything else you'd like to add?

Conclusion Script (< 5 minutes): Thank you for your participation in this interview. Your time is appreciated! You will be receiving a follow up invitation to join fellow participants in a focus group discussion to build upon the questions and insights gathered today. I will let you know when the study has concluded and if you'd like, I can share with you a copy of it.

Appendix D: Email Invitation

Hello,

My name is Jacob Kearey-Moreland and I am a Masters of Education student at Lakehead University (Orillia). I am currently engaged in my thesis research project looking at the influence of educator-supports on the success of garden-based learning (GBL). Of particular interest to me is your experience and perspective as a garden-based educator. In this context I invite you to join me for an in depth, semi-structured phone or virtual interview. Specifically, I want to know what kinds of support you have found (or wish to find) at all stages of your professional development and how these supports have defined and prepared you for success.

Your participation in this study is completely voluntary. Before agreeing to participate or not please carefully review the attached information and consent letter. If you have any study-related questions, please let me know. I can be reached via email at kearey-morelandj@lakeheadu.ca or by phone at 705 309 9669.

Thank you for your time and consideration,
Jacob Kearey-Moreland

Appendix E: Social Media Interview Invitation

Attention garden-based educators!

My name is Jacob Kearey-Moreland and I am a Masters of Education student at Lakehead University (Orillia). I am currently engaged in my thesis research project looking at the influence of educator-supports on the success of garden-based learning (GBL). Of particular interest to me is your experience and perspective as a garden-based educator. In this context I invite you to participate in an in depth, semi-structured phone interview. Specifically, I want to know what kinds of support you have found (or wish to find) at all stages of your professional development and how these supports have defined and prepared you for success.

If you are interested in participating please send me an email at kearey-morelandj@lakeheadu.ca to learn more!

Image attached to social media posting for visual appeal. Image title “Lakehead Volunteer Sunflower” photo credit: Jacob Kearey-Moreland

