

The KNOOKS Project

Place Based Learning and Inquiry in a Digital Culture:
Honouring Student Voice Through Digital Storytelling

By

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Abstract

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With global environmental issues becoming critical, we need to initiate significant societal innovations to ensure sustainable practices for the global good. Shifting to a place-based inquiry model of education best supports concepts of sustainability. Our digital landscape provides a unique opportunity to engage and amplify voices for sustainability. The aim of this paper is to research place-based learning and digital storytelling, with the purpose of ensuring student voice is honoured and amplified. This project includes a resource website for educators that reflects pedagogical and educational practices as they relate to integrating place-based learning and technology.

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Acknowledgments

I would like to take this opportunity to acknowledge the community that is TIEGrad. Technology Innovation in Education is a term that has become well worn in a short time. However, the complexity and ingenuity of this particular cohort truly embodies the ideals and possibility of embracing the concept of access to education for all, regardless of barriers.

Dr. Valerie Irvine had the vision to imagine the possibility, the tenacity to make it happen, and the heart to make it matter. This community has connected on multiple platforms, digital and personal. I have had the freedom to learn via video-conferencing, tweets, direct messages, hang-outs, and have even projected myself into a living room as a robot. I have connected with innovative thinkers tucked away in closets, stairwells, bedrooms, airports, kitchens, and on porches and decks. I have come to know people as they reflect their place in the world – on islands, beaches, mountains, forests, by pools of water, and streams and oceans. Through the fog, both virtual and real, this cohort has been inspirational to me personally and professionally.

Along the way, TIEGrad had access to innovative leaders in education from coast to coast, and the prairies too: a truly Canadian experience. Every time a new professor arrived, our horizons expanded. Finally, a special thanks to Tim Pelton, who guided my final reflections with insight, and providing support as I muddled through to the end.

Dedication

There once was a girl who was not yet wise.

In her once upon a time, there were pioneers.

Hunter, Graham

Walker, Wise

Her story unfolded, guided by practical perseverance

May, Graham

And in her happily ever after,

Steve, Sarah, Kaethel, Ben

The girl is still not yet wise,

but always wondering.

Overview

Research Focus

This project explores the emerging concept of education for sustainability as it relates to our youngest global citizens in a digital age. With global environmental issues becoming critical, there is an expectation that each successive generation will have to initiate significant societal innovations to ensure sustainable practices for the global good. Educators are faced with the task of embedding concepts of sustainability into the daily lives of our students.

Context and problem statement. There is global recognition of the importance of education for sustainability. Specifically, there is advocacy for raising the profile of Early Childhood Education for Sustainability (ECEfS). In 2008, the United Nations Educational, Scientific, and Cultural Organization (UNESCO) penned the *Gothberg Recommendations on Education for Sustainable Development*. This document noted that the logical starting point is early childhood education, and included specific recommendations (Davis & Elliot, 2014). However, the reality is that these recommendations are optional. Suggested recommendations do not readily result in tangible change to policy and curriculum design for public school education.

At the time of this paper's publication, British Columbia is undergoing a shift in thinking regarding curriculum to an inquiry philosophy with a greater focus for place-based learning. Dedicated educators, passionate about environmental education, initiate and implement adaptations to curricular outcomes that may be environmental in nature, but served only to skim the surface of concepts of sustainability. These

initiatives rely heavily on teacher passion, and are often seen as an add-on to an already bloated curriculum. On the other end of the spectrum, philosophies are being implemented provincially that immerse learners in full day, outdoor experiences. Forest kindergartens, such as the research-based program in Sooke on Vancouver Island (Elliot, Eyke, Chan, & Muller, 2014), result in targeted, intentional place-based education. However, as a result of both approaches, a certain level of tiered access comes into play: some learners, sometimes, in some ways, are engaged in education for sustainability. A case needs to be made not for creating pockets of access, but for creating equal access via the public school systems. The issue becomes: how do educators grapple with the daunting task of shifting to a place-based inquiry model, one that best supports those concepts of sustainability we are hoping to instil in our students?

Purpose and questions. The purpose of my investigation into this subject rests on determining what strategies may best support teachers as they instil proactive attitudes in young learners developing a sense of stewardship. This paper further explores the role technology plays in sharing personal experiences, connections, and solutions in a digital culture, with the purpose of encouraging broader societal engagement in environmental citizenship for sustainability.

Questions, research, reflection, and action are at the heart of implementing change. I ask myself: What role does local, place-based education play in developing environmental citizenship? Do the stories we tell about our interactions with place help embed traits of stewardship? Can we engage with our digital landscape to tap into a unique opportunity to engage voices for sustainability?

These are broad and complex concepts. For clarity, I further narrow the focus of inquiry to a convention already familiar to educators. Storytelling plays an integral role in developing identity and citizenship, fosters empathy and curiosity, and by inspiring new ideas, can change the way we think (Ribeiro, 2015). Digital storytelling is considered motivating, engages higher-order thinking skills, and requires a level of organization and reflection that can result in greater comprehension and connection to issues (Hung, Hwang & Huang, 2011). Therefore, in a digital culture, what impact can place-based storytelling have on developing concepts of environmental citizenship? Can digital storytelling provide teachers with the kind of visionary platform required to amplify young voices regarding sustainability issues?

My Professional Story

Personal perspectives. Over time, I explore the relationship between technology and nature by designing projects that tap the power of technology to enable students to tell the story of nature. By choosing to spend time in the natural places close to our school, we become connected to those places. We discover the power of naming our places: Knooks in the case of our class' local nature spots. Further defining each place uniquely keeps nature in our hearts. Grey Tree Knook and Hundred Hug Hollow become a tangible part of our conversation around sustainability. In collaboration with a fellow kindergarten teacher, Knooks expands to an acronym: Kids Need Outdoor Opportunities for Knowledge of Sustainability. The children and I document, curate, and reflect on our experiences primarily through photography: looking closely, comparing over time, and panning out to the bigger picture. We discover sharing artefacts, reflections, and our aha! moments with others is powerful

personally. We begin to see the impact our own actions can have on implementing change.

Kids these days. A visit to our Butterfly Knook, adjacent to a spot that our high school students frequent, prompts a tiny redhead girl to stomp her foot and declare, “Cigarette butts!?? What if the deer EAT them?!”

Inquiry leads to social action. A simple suggestion to create information plaques to post publically meets with agreement. However, this group of five-year-old digital citizens quickly expand on the possibilities. Being a part of a community of learners linked to a broader family and community audience via technology and social media results in the seeds of an idea that amplifies their voice. It isn't a *conscious* integration of technology. It is just in a child's *nature* to think this way.

A series of projects develops, inspired by engaging in our local environments. On a single iPad, through photography, video, song, story, and science, we created an iMovie on one iPad to be used in our school to increase awareness. After successfully obtaining a grant from Special Education Technology British Columbia (SetBC), we used four iPads in my class of twenty-two students. Using the app [MyStory™](#), we created research on local animals that is shared to families via social media. We then collaborate with a grade nine class from our high school. Accessing all twelve of the SetBC iPads, using the app [PicCollage,™](#) (<http://pic-collage.com>), partners created information posters focused on local plants bordering a community walking path. To make it more interactive, each pair of students designed a [TinyTap™](#) (<http://www.tinytap.it>) game linked to the poster with a QR code. A broader audience is

engaged: community members on an evening walk now notice and interact with their local spaces.

This is where technology and nature intersect: in the hands of digital learners, 'kids these days', who are accused of spending too much of their lives glued to a screen. *Those* kids become *that* kid who uses digital tools seamlessly to capture, create, and advocate. Embedding stewardship takes time and scaffolding. Each of these projects serve as the soil, seeds, sun and rain for the purpose of giving our children access to digital platforms that are designed to connect them first personally, then locally, and finally globally to the places that matter to them. It is possible to give stories around sustainability not only voice, but privilege.

Storytelling and stewardship. Place-based stories have the potential to help children internalise, examine and challenge complex themes in developmentally powerful ways. When looking at creating inquiries that addresses a topic as potentially overwhelming as education for sustainability, I went looking for a cultural norm that can help facilitate this shift to living in a sustainable way: the power of a good story. Story shapes and re-shapes thinking, connects ideas to action, and has been used to transfer knowledge, beliefs, values, and even habits from one generation to another (Egan, 1986). Long before there was writing, oral stories were integral to the development of societies. This led me to examine how storytelling relates to student voice, identity and citizenship, and its new emergence in a digital culture. Nature beautifully cradles and nurtures the storyteller in all of us. How powerful will stories of sustainability be when told against the backdrop of a beloved Knook?

Project Description

These student-centered projects have given me a personal look into how we can engage children naturally and positively in practices of stewardship. It has also impressed upon me how impossible it is to do it in isolation. Children need repeated access to nature and to the technology that can shape the way we think about sustainability. So do the educators tasked with embedding concepts of sustainability into everyday practice. In my community, building on the Knooks Project, fellow educators are beginning to embrace these concepts in their own classrooms, and are looking for a community of support to help them mitigate the challenges of curriculum expectations and societal norms that make it so difficult to take on this task.

My project is resource website designed to support teacher efficacy. I focus on sharing my pedagogical and educational practices as they relate to integrating place-based learning and technology in classrooms and schools. The website serves as a stand-alone resource. However, supporting this resource is the option for educators to access a synchronous workshop delivered online or in person.

Providing teachers with an online version of the workshop allows for greater flexibility in access. In exploring many different ways to connect teachers, I have come to see that flexibility in choice of platform, timing and access is essential for success. While the support workshop is suited to traditional professional development venues, such as conferences, what teachers need is informal, personal, options for connecting. Creating those spaces will allow for teachers to engage on a personal level, sharing their stories, and building community with others navigating the same ideology.

Setting a Story Loose

Thomas King, during his 2003 Massey Lectures *The Truth About Stories*, was asked how we might change the world. He suggests that stories are loose in the world: if you want to change the world, simply change the stories. Our stories, our personal narratives, matter. I have never doubted the capacity of young children to engage as active citizens with strong voices. I have never designed projects with the shadow of “Can they?” only with the shadow of “Can I?” This paper and project hopes to illuminate practices that can impact the capacity of educators to embed practices of sustainability by engaging with our complex everyday settings.

Literature Review

This literature review serves to examine the relevant issues impacting the implementation of education for sustainability. I begin with the review methods I employed. Next, a summary of the background of our current environmental and cultural challenges is researched. This section underscores the necessity of developing citizens who embrace stewardship. I then explore how education is called upon to institute these cultural shifts. Theoretical frameworks that support place-based learning are investigated. In addition, international and national policy and curriculum frameworks are examined as they relate to education for sustainability. Finally, I focus on exploring how traditional and digital storytelling may serve as a platform for social change.

Review Methods

In searching through research designed to support, inform, or refute my perceptions of education for sustainability, I began with an essential term – nature. However, over a year ago, searching “nature learning” and “nature play”, resulted in research regarding the nature *of* learning, with almost no reference to learning *in* nature. Repeating the search currently, there is an increased volume of relevant results, relating now to increased research on the importance of learning *in* nature.

Preliminary databases included using Summon, ERIC, and Google Scholar, searching with the term “place-based learning.” Finding a term that is specific but not limiting results in searches that inform decisions when choosing terms to further articulate what theoretical frameworks may be valuable to the topic. This successful

keyword logic guided further searches that included: “place-based learning” OR experiential learning, place-based storytelling, place-based AND digital storytelling, place-based OR sustainability AND education. “Sustainability” was not in initial searches. It was not until terms like stewardship, citizenship, advocacy, and student voice were explored with “OR” and the term “sustainability” that the search became effective. Initially, searches were restricted to journals published after 2010 to ensure current information. This was further narrowed to 2012 when searching in the area of technology and digital storytelling.

Additional review methods include skimming related reference lists and locating research that was references repeatedly in journal articles. Creating scholar alerts also brings research to light. When initial parameters for Google scholar alerts are too broad, unrelated topics complicate the search. Refining the scholar alerts to a very specific topic, such as “digital storytelling” “outdoor education” AND technology, resulted in manageable, relevant research. Finally, accessing research from trusted sources led me to Academia.Edu. Email updates from my news feed, based on the parameters set in my profile information, provided current and relevant research for me to explore that I was not seeing in other places.

Why Education for Sustainability?

Global crisis. Humans have an enormous impact on our ecosystems. Our global population has exploded from about 1.6 billion at the turn of the last century to 7 billion currently (Goleman, Bennet & Barlow, 2012). This increase in population has had a significant and growing detrimental impact on our ecosystems (Hanson et al., 2001; Pievani, 2013). Fifteen years ago, indications were evident that “interactions

between land use and climate change were projected to cause large shifts in biodiversity” (Hanson et al., 2014, p. 765). Human activity now drives changes in the earth’s ecosystems and rivals geophysical processes. As a result, our impact could trigger global systems changes that would be irreversible (Rockstrom et al., 2009; Steffen et al., 2011). This epoch is known as the Anthropocene, a term coined by atmospheric chemist Paul Crutzen in 2000. Current species extinction rates, coupled with loss of biodiversity threatens ecosystems indicating that a sixth mass extinction may already be underway (Pievani, 2013). A cocktail of human impact, including habitat fragmentation, pollution through use of chemicals, overpopulation, and exploitation of resources, is creating the conditions for an extinction crisis.

Huckle (2014) indicates that our current ecological crisis stems from massive consumer and capitalistic growth from the 1950s to the mid 1970s that resulted primarily in a use of resources that was not only unsustainable, but uneven in its exploitation globally. At that time, resource scarcity and pollution began to impact wealthy countries, driving global initiatives and policies:

In our time, human (sic) capability to transform our (sic) surroundings, if used wisely, can bring to all peoples the benefits of development and the opportunity to enhance the quality of life. Wrongly or heedlessly applied, the same power can do incalculable harm to human beings and the human environment (Declaration of the United Nations Conference on the Human Environment, 1972, p. 1).

Regardless, we continue to engage in practices that put at risk the “non-negotiable planetary preconditions that humanity need to respect in order to avoid the risk ... of

catastrophic environmental change at continental and global scales” (Rockstrom et al., 2009, p. 2). These planetary boundaries fall under broad categories: geochemical cycles; global circulatory systems; self-regulating biophysical features; and impacts around aerosol loading and chemical pollution (Goleman et al., 2012). We have currently exceeded limits for three of seven recognized boundaries, and there is uncertainty around which boundaries can be compromised before causing irreversible climate change (Rockstrom et al., 2009). Bluntly, our basic needs are at risk, and we are living beyond our means (Davis, 2010).

Global recommendations for sustainability. In response to this growing environmental crisis, the United Nations launched the UN Decade of Education for Sustainability in 2005. This initiative tackles a range of issues including fostering peace, fighting global warming, fighting against poverty, and the marginalization of women and children. Central to all of those issues was sustainability:

Sustainable development means having a different vision of the world:

Sustainable development, a constantly evolving concept, is thus the will to improve everyone’s quality of life, including that of future generations, by reconciling economic growth, social development and environmental protection (UNESCO, 2005, p. 3).

This initiative was focused primarily on teaching the importance of sustainability, and in some ways neglected to address the real issues of creating a cultural shift: engaging in implementing awareness and change. It is imperative to see our children not as passive recipients of information, but as active citizens. Our youngest learners come to us as citizens, with powerful voices. “Children are not *becoming* people – they

are people” (Apler, 2011, p. 188). Embedding the story of sustainability in early learning has the potential to create societal shift.

Commitment to this goal is evident in the United Nations follow-up proposal for a Global Action Programme on Education for Sustainable Development after 2014. “Sustainable development cannot be achieved by political agreements, financial incentives or technological solutions alone. Sustainable development requires changes in the way we think and act. Education plays a crucial role in bringing about this change” (UNESCO, 2014, p. 4). In 2008, the *Gothberg Recommendations on Education for Sustainable Development* was issued. In 2009, those same recommendations were ratified by the UNESCO World Conference of Education for Sustainability. At the same time, the World Organization for Early Childhood (OMEP) first promoted ECEfS as a key theme, and at the 2013 OMEP World Congress, sustainability was profiled “as a cornerstone of high quality early childhood services” (Davis, 2014, p. 4). There is no lack of initiative, but it does not result in fundamental change.

There is hope and possibility if only we choose to act decisively and collectively as global citizens (Goleman et al., 2012). The weight of developing sustainably minded citizens rests mostly on the shoulders of educators. Education needs to nurture curiosity and foster understandings of the interconnectedness of living things (Chiarotto, 2011). Though sustainability is everyone’s business, in order to bring change to how we live, we need to fundamentally change how we think (Davis, 2011). Educators will be called upon to play a huge role as moving to a biocentric worldview becomes essential (Davis, 2010; Suzuki, 2003).

Disconnected from nature, connected to the world. An element that feeds this disregard or blindness that we have to the environmental crisis facing us is the fact that we are increasingly disconnected from our natural environments. We are spending less time outside, even on a recreational basis. Motivating citizens for sustainability is challenging from a soft sofa. New findings reported by the 2015 ParticipACTION Report Card on Physical Activity for Children and Youth indicates that simply being inside is the greatest risk to our children's health. Examining patterns of engagement with technology indicate increased attachment to our screens. The Canadian Sedentary Behaviour Guidelines recommend restricting screen time to zero for ages Zero to two, and less than an hour for two to four year olds. For older children, (ages 5 to 17) the recommendation increases only slightly to two hours a day. However, only 18% of the 3- to 4- year-old range met those guidelines.

According to Active Healthy Kids Canada (AHKC), in their 2014 Report Card, Canada has exemplary programs, initiatives, and practices designed for access to outdoor spaces for the purpose of physical activity, but they are simply not being utilized. The David Suzuki Foundation report on Youth Engagement with Nature and Outdoors summarises a few key findings. Youth (defined in the survey as between the ages of 13 and 20) feel that they do not have time for outdoor programs. Further, over seventy per cent of youth in Canada spend less than an hour per day outdoors. However, when asked what they do outdoors, over half indicated they choose unstructured activities that involve social interactions, and engaging their natural curiosity. Additionally, older youth are more interested in learning about and engaging in environmental issues (Zorzi & Gagne, 2012). This report also speaks to the

importance of children getting outside at a young age, the role of parents and family in getting teens outdoors, and the pivotal role that schools play. Over two thirds of those surveyed indicated having accessed nature based programming in their school setting (Zorzi et al., 2012). It falls on policy makers, and curriculum design to combat these societal norms by embedding change into the fabric of our schools, providing students with the inquiry-based platform they are wanting.

Theoretical Frameworks

As we look to education for sustainability as embedded practice, we look to the theoretical frameworks that support initiative, innovation, and developing a sense of citizenship. This section explores constructivism and social constructivism as it relates to place-based education.

Environmental education. As the literature has indicated, education needs to address yet another cultural shift. The challenge is structuring a cultural story that is granted privilege during this moment in time when “there needs to be seismic cultural change, from a worldview which is non-environmental in its practices ... to one that is ecologically grounded” (Blenkinsop, 2012, p. 355). Three styles of environmental education emerge. One, environmental sustainability challenges are a result of our modern choices, and that change needs to occur at a cultural level. Secondly, spending time in natural spaces builds relationships with the connected world. Finally, that we relate to the concept that knowing the good helps us to do the good (Blenkinsop, 2012). We need more than environmental education, we need environmental citizens.

Citizenship and social constructivism. Our schools are the caretakers of our culture. Over a century ago, in *The School as Social Center*, Dewey reflects that the concept of citizenship was broadening, encompassing relationships involved in becoming an engaged member of a community. Little has changed. “We are dealing with a complicated interaction of varied and vital forces” (Dewey, 1903, p. 76). Learners need access to broad, interconnected disciplines, allowing for the natural development of fundamental skills needed to allow a child to tap into their current potential. Egan, in 1984, distils Dewey’s psychological method: “Children’s minds were not merely passive organs into which content could be pressed. They are active, and capable of enormous and easy learning in the informal settings of everyday experiences” (p. 105).

The voices of Dewey and Egan, separated by decades, resonate in their similarities. Both speak to how imagination and language, in the form of story, lead to inquiry. Dewey summarises that in following a method of inquiry, we need to stimulate a learner’s four natural impulses: social impulse, through conversation; constructive impulse expressed in play, movement, and make-believe; investigative impulse, through interaction with a real environment; and the expressive impulse, built via communication and constructive instincts. Children need environments that are problematic, create doubt, and are complex enough to push learners to experiment with their environments (Polito, 2005).

Egan sees those impulses playing out most powerfully in the form of the conflict, or the binary opposites we see embedded in story. There is no good without evil. In this context there is no meaning without engaging learners at an emotional level. “To

present knowledge cut off from human emotions and intentions is to reduce its affective meaning. This affective meaning, also, seems especially important in providing *access* to knowledge and engaging us in knowledge” (Egan, 1986, p. 30). Further, Egan notes that imagination is at the heart of the issue: the unpredictable, spontaneous, and endless ways that learners use knowledge.

Bruner (1966) encapsulates these essential components of education: “five great humanizing forces are, of course, tool-making, language, social organization, the management of human’s (sic) prolonged childhood, and human’s (sic) urge to explain” (Bruner, 1966, p. 80). Dewey, Egan, and Bruner all shape my personal definition of constructivism: the importance of engaging with others in complex, real-world interactions, with opportunities to reflect critically on those experiences, and be able to articulate those ideas to others. The philosophies underlying the frameworks of both constructivism and social constructivism come into play when I further explore place-based education as it relates to embedding education for sustainability into the structure of our society.

Place-based Education

“Knowledge without love will not stick. But if love comes first, knowledge is sure to follow.” — John Burroughs (American naturalist, 1837 – 1921). We have come to this crossroads, with a unique opportunity to make fundamental changes to the way we approach education for the 21st Century. Developing a relationship with nature is an essential component of creating environmental stewardship. In his book, *Childhood and Nature*, Sobel (2008) looks at the design principles that marry school and nature. Currently, children actively learn to “not-think” (p. 2) about the relationship between

what they do in school and what is happening outside the walls of their own school. How do we design the school environment to encourage children to think in sustainable ways? What *local* experiences will shape young adults thinking to protect the environment, participate in conservation conversations, reflect on their consumer decisions, and work to reduce the environmental footprints of their personal lives and the organizations where they work (Sobel, 2008)? Louv(2008), author of *Last Child in the Woods*, wonders if it is enough that a child can tell you everything about the Amazon Rain Forest, yet has no memory of exploring their local woods, lying in a field, watching the wind move the clouds (Louv, 2008). Embedding a personal connection to place, to land, as a cultural norm, as a societal given, becomes the vision.

Indigenous ways of knowing. This vision can be realized when we come to honour indigenous ways of knowing, and the impact place and story carry in cultures that embody sustainability, respect, and thought for future generations in the very core of its philosophy. “When we are engaged with place, we are carrying out an act of remembrance, a retelling of the stories written there, while also continually rewriting these stories. Being-in-place is continually an act of engaged/active learning” (Johnson, 2010, pg. 830). When considering indigenous wisdom, respect and connection with all aspects of the spiritual nature of *land* rather than simply engaging with *place* are reflected in indigenous language and knowledge systems (Richie, 2015). If educators are using these frameworks to shift western perspectives, it is imperative that indigenous ways of knowing inform our choices, but that we do not appropriate, assimilate, or perpetrate a continuance of cultural erasure (Johnson,

2010; Richie, 2015). It is essential that all educators engage *personally* in educating themselves on the complex structure and history of indigenous peoples as it relates to the implementation of global and local place-based initiatives. “Rather than seeing indigenous knowledge and its various forms as an anthropological curiosity or even entertainment, places of learning should come to see indigenous knowledge as a legitimate source of knowledge” (Hare, 2011).

Additionally, recognizing the diversity of aboriginal and indigenous perspectives requires partnerships with local communities, respecting local and culturally specific practices, and protecting the integrity of each knowledge (Hare, 2011; Miller, 2015; Rich, 2012). While the complexities of this may seem to be overwhelming, every place-based philosophy needs to hold these truths. Critical pedagogy of place seeks to acknowledge environmental colonization, recognize concrete experiences of community, and challenges us to adopt approaches that have us unlearn that learnt from schooling practices steeped in a dominant cultural bias (Johnston, 2010; Richie, 2014).

Role of curriculum. If place-based education is fundamental to education for sustainability, in what ways are policy and curriculum innovation honouring the ideals set out by indigenous ways of knowing? How do the modern interpretations of Louv, Blenkisop and Sobel find their way into our classrooms? Will just providing students access to natural settings, be they urban or rural, develop active citizens for sustainability? The reality is that curriculum is the vehicle for change. It matters how we design, adapt, and structure the curriculum that is expected to be implemented.

Currently, the re-structuring of curriculum in British Columbia is portrayed as progressive, meeting the personal needs of 21st century learners.

“We need to make a better link between what kids learn at school and what they experience and learn in their everyday lives. We need to create new learning environments for students that allow them to discover, embrace, and fulfill their passions” (Abbott, 2011, p. 2).

The initial drafts of this curriculum focused on ensuring students access to deeper learning environments that offer access to real-world issues, using knowledge to solve problems, and articulate solutions based on core competencies (British Columbia Ministry of Education, 2015). This allows teachers the flexibility to re-imagine the classroom setting, engage students in place-based learning, and choose personalised paths for students, while honouring the philosophies of constructivism and social constructivism. The guiding principals for future curriculum development include the integration of Aboriginal worldviews and knowledge (British Columbia Ministry of Education, 2013). Within the Social Studies Kindergarten to 12 curriculum, specific references to our interactions with environment provides educators with opportunities to launch inquiries around sustainability. It is however, the onus of individual teachers to ensure environmental issues are addressed. In fact, all curricular outcomes can be met without ever having stepped out of the classroom door.

Educators committed to the concept of environmental education have taken the initiative to design curriculum guides and maps intended to create cross-curricular frameworks for implementing environmental and experiential learning in British Columbia. The *Environmental Learning and Experience (ELE) Guide & ELE*

Curriculum Maps (Environmental Educator's Provincial Specialist Association, BC Hydro & BC Ministry of Education, 2008) are documents built by teachers that are fully approved by the Ministry of Education. While these documents are an excellent resource, they are based on a curriculum that is being phased out.

In examining the first drafts of the science curriculum, issues were noted. The British Columbia Environmental Education's Provincial Specialist Association (EEPSA) states:

“Specifically, there lacks an inclusion of ecological literacy throughout the grades. The exclusion of ecology from certain grades, and *de-emphasis* on environmental and biological sciences, results in a lack of direction or way forward for teachers hoping to achieve the over-arching goals set out in the overview. A clear and explicit continuum of big ideas and content standards focused on ecology would better serve teachers and learners. Ecology provides learning foundations for the expression and enactment of personal and social responsibility in place-based, community-connected ways.” (EEPSA, 2015, “Curricular Updates”).

This site goes on to outline concerns in regards to simplified outcomes at younger grades, eliminating the more complex concepts being discussed at grades where children begin to think more deeply and contextually, and the apparent elimination of a Waters Systems focus that can result in reduced student engagement with local ecosystems and the sustainable management of this essential resource. Rather than explicitly embedding education for sustainability, the initial draft curriculum was on a path that waters down curriculum expectations in this area. However, continued

revisions, initiated by educators and stakeholders intent on ensuring place-based learning be honored, have resulted in curricular expectations that include experiencing the local environment, and reflecting on personal experiences with place (BC Ministry of Education, 2015).

Research supports the impact that embedding place-based learning in curriculum can have. In 2010, Scotland implemented *Curriculum for Excellence through Outdoor Education (CfEtOE)*. It states unequivocally, “education for any child in Scotland must include opportunities for a series of planned, quality, outdoor learning experiences” (Mannion, G., Mattu, L. & Wilson, M., 2015, p. 3). This policy implementation moved ‘outdoor learning’ (as it is termed in Scotland) from a largely extra-curricular role to one that is embedded into core curriculum. In 2015, Scottish Natural Heritage commissioned a report titled *Teaching, learning, and play in the outdoors: a survey of school and pre-school provision in Scotland*. The focus was to determine “to what extent, in what ways, and with what impact are schools and pre-schools utilising the school grounds, local areas, and other places beyond?” (Mannion, Mattu, & Wilson, 2015, p. 1). This commission, which was a cross-sectional study comparing data from 2006 and 2014, was designed to provide new baseline measures on the impacts of taking learning outdoors. Teachers provided records on over 50,000 child-hours over 800 events. These records reported on individual educational outdoor events focused on “durations, locations, learning foci, participant numbers and other contextual aspects such as who led the event” (Mannion, Mattu, & Wilson, 2015, p. 1).

Focusing on the findings as they relate to early childhood education, it was found there was an increase from 19 minutes per week per student to 30 minutes

per week per student. This reflected an increase of teacher-led events on school grounds. “The effect of learning and play within green and natural spaces of all kinds through residential and non-residential experience alike was particularly strong in generating greater engagement and challenge and enjoyment” (Mannion, Mattu, & Wilson, 2015, p. 25).

Even enacting simple changes regarding where children can play at recess can result in positive change. Chawla, Keena, Pevac, and Stanley (2014) focused on childhood stress, resilience, and access to nature. They studied children’s informal play choices and experiences in three diverse settings and with three diverse age groups, observed annually from 2006 to 2010. The first site allowed children six to twelve years old access to five different recess choices: field, playground, creek, woods, and pine grove. The second site (grades four to six) offered asphalt parking, playground, grass field, scrub oak forest, and supervised access to a habitat offering a pond, trails, seasonal stream and open meadow. The third site focused on four High School locations offering access to gardening in various settings.

These local experiences promoted collaboration, autonomy, and gave children a sense of independence, ownership and freedom to choose (Chawla et al., 2014). The range of access to outdoor spaces ensured that children were engaging with their spaces in developmentally appropriate ways. Sobel (2008) identifies seven play motifs when children are engaged in free exploration in nature: “(1) making forts and special places; (2) playing hunting and gathering games; (3) shaping small worlds; (4) developing friendships with animals; (5) constructing adventures; (6) descending into fantasies; (7) and following paths and figuring out shortcuts” (p. 20). The 2014 Chawla

et al study confirms these motifs, noting different ages interacted in developmentally appropriate ways with nature.

Learning locally, in schoolyards and neighbourhoods, “illuminates aspects of the environment right where students live; its richness, its possibility, its problems and its possibilities”(Kosak & Elliot, 2014, p. 12). Commonly reported curriculum themes emerging from accessing local school grounds include an increased focus on sustainable development and citizenship, as well as teachers reporting that students took an active and collaborative approach to their learning, developing teamwork skills (Commissioned Report No. 779, 2015).

In a study focused on undergraduates, Brenner, Hamilton, Drake & Jordan (2013) indicate that currently, in the field of environmental studies, students have little local environmental knowledge (LEK). This results in them having an unfocused sense of place. In response, an environmental sentinels course develops the “the importance of place, the value of powerful, transformative learning experiences, the utility of integrated, multiple learning domains, and their relevance to undergraduate education in environmental studies and sciences” (Brenner et al., 2013, p. 406). As a result of completing the course, student’s LEK increased threefold, showed evidence of being more rounded, and student confidence in personal LEK increased. Many of the tasks outlined in this wilderness skills and awareness training are reminiscent of tasks that early childhood settings often engage in. Field-based homework involved “sitspotting,” a routine that requires stillness, silence, and observation. Students indicated this routine provided them with transformative learning benefits. A second routine, sketch mapping, proved to be tedious and challenging, but made them think spatially in a way

that simply accessing maps on digital platforms cannot mimic (Brenner et al., 2013). These types of tasks can now be embedded in the fabric of curriculum that honours place-based learning throughout a child's education.

To summarize, research indicates that place-based education is integral to combating the global challenges outlined. Certainly, children should have informal access to nature in their play. Additionally, Scotland's explicit inclusion of access to outdoor education as a national initiative shows promise, particularity in the early years, and can serve as a model as British Columbia re-designs its 21st century curricular frameworks.

Storytelling and Citizenship

Finally, this literature review explores how traditional and digital storytelling may serve as a platform for social change. It begins with a brief analysis of traditional storytelling and the emergence of digital storytelling. As the intent of this project is uncovering strategies for engaging children in active citizenship by amplifying their voices in support of sustainability, this literature review will then examine the emergence of mass media and its impact on transformative social participation.

Story: Traditional to digital. Children use story, fantasy and play to make sense of the world around them (Paley, 2004). Storytelling is used to transfer knowledge, beliefs, values, and habits, from one generation to another (Egan, 1986). Narration, engaging in story, helps us to make sense of the world (Aberg, Lantz-Andersson & Pramlin, 2014; Bonsignore, Alexander, Druin & Bederson, 2013). Egan (1986) suggests that the structure of story can help us navigate a messy and unpredictable world. Good stories have a principle of coherence, rhythm and

predictability, introducing conflict and tension through binary opposites. Using this powerful and universal story structure presents abstract concepts in a format children easily grasp and access to create new knowledge. Culture is a conversation, education is learning the language of that conversation: immersing learners at an early age to that conversation that creates engaged citizens (Egan, 2008).

Technology-based innovations have not re-defined storytelling, simply allowed it to be re-imagined. Digital Storytelling was initially defined by the Center for Digital Storytelling in the 1980's, and implies a two – three minute personal story told with the use of graphics, audio and video, including many elements of story (Ribeiro, 2015). While accurate, it fails to capture the true nature of storytelling, and its evolution in a digital world. A more accurate description was penned by Leslie Rule, as she sought to define it in 2001, "Digital storytelling is the modern expression of the ancient art of storytelling. Digital stories derive their power by weaving images, music, narrative and voice together, thereby giving deep dimension and vivid color to characters, situations, experiences, and insights." (Rule, 2001, as cited in Rule, 2010).

Citizenship in a digital age. Citizens who are expected to be facing not only our current environmental issues, but more that will develop, need a skill set that is shifting in relation to access to mass media. "New communication technologies have changed the nature and scope of citizenship" (Simsek & Simsek, 2013, p. 126). Citizens today could conceivably participate in social processes at any time. The social characteristics of new media are defined as: choice, conversation, curation, creation, and collaboration (Knight Commission Report, 2009, p. 40). More than ever, when engaged in a learning environment that is constructivist in nature, our children have the

access to powerful digital tools, amplifying their ability not only to articulate their reflections and conclusions about complex experiences, but to share that story out to local and global communities. “Digital Storytelling is evolving as a potentially powerful innovation to support the aims of global citizenship education while meeting the demands of a digitally immersed student population” (White & McLean, 2015, p. 6).

Access to mass media and digital tools impacts our language, social organization, our education system, and our compulsion to explain. 21st century technologies explode the notion that we are simply consumers of content, and allows anyone to be engaged in the creation of content (Bonsignore et al., 2013). This opens the door for students to be actively engaged in critical pedagogy and transformative education praxis.

Critical pedagogy and transformative learning. As previously discussed, theories of constructivism support the active engagement of learners in their local environments. In addition, social constructivism demands learners interact socially and critically reflect on those concrete experiences. These tenets are supported and expanded upon when we now consider Freire’s statement: “World and human beings do not exist apart from each other, they exist in constant interaction” (Freire, 1970/2005, p. 50).

Digital storytelling, as it relates advocacy in education for sustainability, supports not only constructivism philosophies, but also those found in critical theory and transformative education approaches. These theories promote more than engaging in social critique, they focus on creating change (Davis, 2014). Digital storytelling is a powerful concept that “embraces its potential for democratization and

empowerment” (Davis & Weinshenker, 2015, p.50). More specifically, the stories we tell in relation to our identity are not merely reflective, they are definitive. Our stories connect past understanding, and thereby influence our version future stories (Ching & Wang, 2015). Additionally, youth that may be disaffected from dominant cultural narratives are being supported through the act of digital storytelling to critique and rewrite the stories of privilege, power, and identity (White & McLean, 2015).

In conclusion, storytelling houses our historical cultural truths, yet is also the language of cultural transformation. It can serve to perpetrate stories of dominant cultural themes, or to break them down. In a digital world, storytelling facilitates critical reflection through participatory, reflexive, and artistic processes (White & McLean, 2015). As education for sustainability requires this component of advocacy, educators designing projects around digital storytelling need to expand the notion of literacy, from simply words to include image and voice, linking us emotionally to our own identity and to the diverse global interpretations of our world (Davis & Weinshenker, 2015).

I embarked on this literature review with the purpose to clearly articulate and support my own understandings of education for sustainability, and further, to provide other educators with the research and background needed to take on the task of embedding citizens of stewardship. I began by outlining my own research review method, in hopes that others will take on the challenge of shifting our thinking. I then researched the current global environmental situation, clearly supporting the need for facilitating a shift in the way that we approach sustainability as a global community. In order to gain perspective on the scope of the history and current state of policies and interventions, I outlined global initiatives around education for sustainability. Reflecting

on theoretical frameworks: social constructivism, constructivism, and honoring Indigenous ways of knowing, provides the foundation upon which education for sustainability can thrive. Finally, I explored the deeply rooted, powerful role storytelling plays in the creation of culture, the shaping of citizens, and the transformation of learning as we see it now.

Personal Project

Throughout this journey, I have come to find that continued engagement, big or small, with local places matters. Offering opportunities for children to explore, record, and share their ideas to a community who matters is powerful. It can result in a level of engagement in concepts of stewardship and sustainability that has the potential to nurture citizens who are curious and connected to place. In turn, those connections serve to inspire active citizen engagement.

The goal of this project is to curate the ideas, inspiration, and projects associated with my exploration of place-based learning with young learners. The challenge is creating a space that inspires and creates community. Certainly, the foremost discovery of my exploration of place, nature, technology and citizenship is the role story plays in shaping our world views. For young learners, story can be represented through photographic and video documentation. It is important to choose a platform that could showcase student voice.

The Knooks Project: A Website

In designing a platform to connect educators and share out my own journey, I chose a website for a few reasons. A website is not static. It allows for the growth of the project. It can become a living archive of those projects that may serve to inspire or inform others. A website is highly visual, and provides a platform for sharing the images and digital stories that were inspired by young learners.

Home page. Housing the pertinent information without overwhelming the viewer was the main goal of the Home Page (Figure 1). At the heart of my learning was the

simple power of a photograph. Actively using pictures that reflect a child's passion, curiosity, and wonder serves to embed a sense of ownership and connection.



Figure 1. Home Page of The Knooks Project
(<http://msauerborn.wix.com/theknooksproject>)

Additionally, this page gives the simple essentials to getting outside, regardless of the weather. As teachers can often be overwhelmed by the possibilities, it is important to be succinct in the ways we can minimize those challenges. As a result, I chose to create pop-ups on the photos to give those tips immediately to teachers.

Story. The Knooks Project is a personal one. While the themes and goals of this project are familiar to educators, the journey should be personal. The About page (Figure 2) is my story, as it unfolded with a simple purpose: get outside. The direction it took, the roots that took hold and grew, the projects, my focus on technology, are all unique to my experience. The purpose of this project is not so much focused on the logistics of *how* we get outside, it is what we are inspired to *do* when we are out there.

About the Knooks Project

What if?

What if we set a goal to get outside?

What if we started to connect to our outdoor places so much that we began to name them?

What if we wanted to document and share what we are learning with our Families and Community?

What if technology is not all evil, but is a powerful tool for advocacy?

The Knooks Project began with a simple objective: Be outside.

Initially, we went on local walks, with stops in my backyard. There we planted gardens, flowerbeds, worked in a small greenhouse, and played.

We explored the forests and paths on our school property, and the forests between our homes and school.

Whenever outside, the children would wonder, question, engage and grow their curiosity, and mine.

While the children asked their own questions, I reflected on mine:

How do we best capture the voice of a child?

How do we best honour children as capable and committed citizens?

How do we amplify the voices of our youngest citizens so that they feel connected to their families and communities?

This website is not about *how* to get outside. It is about curating, documenting, and sharing our stories once we are there.

Mardelle Sauerborn

Follow @learningmurd

Google earth

Figure 2. An overview of the guiding questions driving the project.

(<http://msauerborn.wix.com/theknooksproject#!story/c1wfv>)

Sun. The impact that technology has had on our ability to create, share, and unite our communities cannot be ignored. It was important to create a space that showcases the simplest forms of technology tools that are accessible to many: the

power of a picture, and the impact video can have on reflecting curiosity (Figure 3). A picture can inspire a thousand words. Additionally, samples of video that honour a child's innate sense of curiosity are highlighted.

Shining a Light in a Digital Wold

As simple as a picture . . .



A picture is worth a thousand words. More importantly, a picture can inspire a thousand words.







The Power of a Picture

When we talk about technology, we sometimes get too complex too fast. Nothing is as powerful, to my mind, as a photo that reflects a child's wonder and curiosity. Photos act as a catalyst for conversation, debate, and advocacy and reflection.













The Power of Video

Additionally, a video allows for the honest interpretation of a child's passion, questions, or reflections.





Figure 3. Examples of digital photography and videography (<http://msauerborn.wix.com/theknooksproject#!sun/c4fi>)

Tools. The Tool Shed is a page that houses the technology platforms used in the projects, plus tutorials to help teachers become familiar with the tools. Additionally, they link to student projects.

The screenshot shows a webpage titled "The Tool Shed: Tutorials" with a green background. At the top, it says "There is an App for That later" followed by icons for a fork and knife, a pencil, an open book, a camera, a smartphone, and a laptop. Below this, it states "The options are endless. The key is keeping it simple, and connected to the child." The page features four app recommendations in a 2x2 grid:

- Pic Collage:** "Pic Collage is my favourite app. It is versatile, easy to use, and allows for flexibility in design. A short tutorial is here. See it in use for the Knooks Knowledge Project." (Link: [See it in use for the Knooks Knowledge Project](#))
- My Story:** "My Story is one of many book maker apps. Any will do if they allow for easy access to photos, and allow for recording of a child's voice. An example of its use is in our Animal Reports Project." (Link: [An example of its use is in our Animal Reports Project.](#))
- TINY TAP:** "Tiny Tap is an app that allows children to build their own games, on any topic. See it in use for the Knooks Knowledge Project." (Link: [See it in use for the Knooks Knowledge Project](#))
- popplet:** "Popplet is a Mind Mapping tool. Teacher Matt Gomez has a great tutorial. We used it in our Bat Project." (Link: [We used it in our Bat Project.](#))

Figure 4. A collection of apps suited to amplifying student voice.

(<http://msauerborn.wix.com/theknooksproject#!tools/y1tw0>)

Seeds. This page (Figure 5) houses links to those who serve as inspiration and resource. When exploring place-based education, it is important to connect with other educators who can inspire and inform your own growth. The purpose is to curate and share avenues for educators to explore both local and global connections. Additionally, it links users to resources that are designed to take you through the initial steps of getting outside.

The Seeds of Inspiration

Place-based learning starts with your place. Your home. Your local neighborhoods and communities. We honour the Ktunaxa Nation, on whose land we live. Here are resources to find our local experts, community projects, funding, and inspiration.

Local Resources: Kootenays



Get Outside in British Columbia



Global Inspiration

Connecting to others who feel the same passion and commitment to bringing Nature and Place Based Learning to their classrooms can be the difference between "I think I can . . ." and "Yes we can". In the same way young children feel empowered when their voices are shared, so to do educators. I am inspired by real teachers.



Figure 5. A resource page housing links to local, provincial, and global support.

(<http://msauerborn.wix.com/theknooksproject#!seeds/cctnm>)

Pollination. Sharing our stories is at the core of this project (Figure 6). We build family connections, and strengthen community through story. Letting those stories loose in the world creates opportunities for learners to collaborate and compare with

other communities. This creates opportunities for questions that grow our curiosity. In this section, I focus on sharing ways to build community in a digital world. Family Facebook allows my community of learners to connect with each other and their families.

Stories on the Move

Sharing our story. . .

Our communities, the ways we connect and build culture have always circled around the power of story. We once told and retold stories around the campfire, we now do the same thing digitally, first with family, then communities personal, local and global.

Family Facebook

For a number of years I have created a closed group for my community of learners. Parents, and now grandparents, have a window into our world.

Connecting first to family is essential. We share our stories with the people who matter to us. Telling, and retelling stories of who we are, where we are from, and how we connect is how communities are built.

Twitter

Seeing the world through your own perspective, and then sharing it with another community of learners broadens our own perspectives, and creates opportunities for questions and comparisons to grow our own curiosity.

Finally 🍷 the #kindergartenbioblitz iMovie. Thanks to our camera kids, movie makers, lead and echo singers

Mardelle Sauerborn @KnooksCrew 54d
@RangerRidley #kindergartenbioblitz we think this herbivore has scat like that!!!
pic.twitter.com/MLLA9FnbaQ

Figure 6. Social media platforms connecting learners to their community.


(<http://msauerborn.wix.com/theknooksproject#!pollination/k9agw>)

Using digital tools, such as [Padlet](#), encourages classes globally to connect personally. Belonging to a twitter community connects children with a broader global perspective. The options for connection are staggering, but choosing a few that are

right for you is the key. This page also houses a Prezi presentation that outlines a few additional platforms, such as [Skype](#) and [Google Maps](#) (Figure 7).

Padlet

Padlet (formerly WallWisher) offers a private, personal connection to classrooms. It is an opportunity to grow our community.



Getting Started

This Prezi presentation outlines connecting first to family, then to community, and finally to global communities.




Figure 7. Social Media platforms connecting learners to global community.


(<http://msauerborn.wix.com/theknooksproject#!pollination/k9agw>)

The Projects

This section holds the heart of combining place-based learning with technology and young learners. The main page (Figure 8) showcases each project with a visual and title, but each project has its own page consisting of an introduction, the project itself, and guidelines for completing the projects. These guidelines change with each project. Some are best suited to a unit plan for down load, some require tutorials on the technology used, and some stand as a beginning point for others to re-imagine.

The Projects: Student Voice

"What if the deer
ATE the cigarette
butts?"



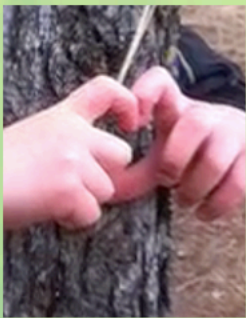
- Little Red-Haired Girl

It begins with questions, that lead to problems, that need solutions.


The following projects are designed to engage students as citizens in their class, school, and local community.

This is done by sharing our own stories.

Garbage in our Knooks



MyStory



Knooks Knowledge:




Figure 8. Main page housing links to all projects

(<http://msauerborn.wix.com/theknooksproject#!projects/omkgd>)

Garbage in our Knooks. This inquiry project asks the simple question – why is there so much garbage in our Knooks? Connecting on an emotional level is very powerful. The children who helped me with this project were driven by a deep sense of


loyalty to the places they had connected to for the whole year. The inquiry, the tangents, the problems that needed solutions, and the final sharing out to our school community with a permanent artefact (an iMovie), proved to instil in them a recognition that they were being heard. This story resonated with the whole school population, a *local* audience that mattered to the children (Figure 9).

Gargbage in our Knooks

A Documentary

I asked my K class to help me with a passion project. You simply choose something that is important to you, and try to address the things that might be impacting it. We love our outdoor spaces - we even named them Knooks. What was making me *mad* was that there was always garbage in them everytime we went to play. The Kindergarten class helped me make a documentary (really a PSA :) to inform the other kids at our school about the problem.

This project was completed using one personal iPad.



Inquiry and Place Based Learning

Engaging children in inquiry learning requires frontloading, luck, timing, and planning. In this project, I structured the process, the product, and created a story board that guided the inquiry.

Planning for these projects can feel overwhelming. Concept maps, story boards, and structure are the foundation for being able to take tangents.

Connecting the Dots is a resourse created by Learning for a Sustainable Future. It offers guidance, structure, and possibility for teachers planning a large inquiry.

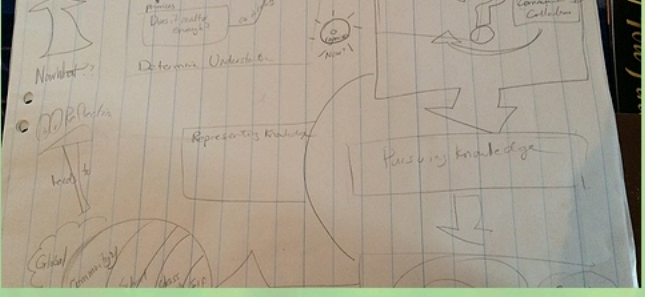


Figure 9. Inquiry project based looks at garbage on our school playground.

(<http://msauerborn.wix.com/theknooksproject#!gargbage-in-our-knooks-/je3p3>)

My Story. A technology version of a research project, what made this experience resonate with the students was the feature of the app MyStory to capture

student voice, and allow for choice. Again, what is significant is not just the story, but to whom we share it with. In this case, our families were the audience. In a digital culture that sees the world as the potential audience, it is important to remember that young children do not care what the world thinks. It is a huge part of their charm. They are proudest sharing with someone that matters to them, their mom, brother, or grandma.

My Story - Who Lives in the Forest?

The Old-Fashioned Research Project

Having secured funding from SetBC, we embarked on the iPad project. This was designed to explore tools that could give kids access to their voice. This project was completed with four ipads.

I chose the app MyStory as it fulfilled an essential requirement - access to recording a child's voice.

Many students chose to research local animals, but as the Olympics were on this particular year, we also have projects focused on winter sports. It helped to open my eyes to the possibilities of place-based learning as it relates to Physical Literacy. But that is another story.




Figure 10. Teacher reflection of an inquiry project using iPads.

(<http://msauerborn.wix.com/theknooksproject#!my-story/mbcjw>)

This project involved securing a grant from SetBC for twelve iPads in our school, four of which I use in my classroom. A part of that project involved our team of three kindergarten teachers sharing the journey through blogging. A link to that blog is housed on this page as well.



Figure 11. Teacher SetBC Blog Reflections on Kindergarten iPad Project.

(<http://msauerborn.wix.com/theknooksproject#!my-story/mbcjw>)

Knook Knowledge. The goal of this project was to extend and create a new community of learners (Figure 12). The kindergarten and Grade 9 classes paired off to create a poster and a game that showcased a local plant. We ended up with individual posters linked by QR code to online games that invited anyone with a cell phone to scan and share in their learning. In working towards this goal, the role of expert often fell to the five-year-old learners. This apparent role reversal had quite an impact on the grade nine students. While the project itself is intended for a broad community audience, the connections built between two curious brains proved to be the best part of the inquiry.

Knook Knowledge: Plant Power

Partnering with Big Buddies

Our Grade 9 buddies helped us to unearth the power of the plants in our local spaces.

This project was completed using 12 iPads.

We created posters with PicCollage™ and then games with TinyTap™ to help others explore the plants around them. We used QR codes to link the two projects together.

We compiled the posters in a Knook Book to share to our school and community libraries. Finally, we hope to post the posters in the Knooks beside the plants located on our community walking paths.

Figure 12. Showcasing a collaborative project connecting multi-aged learners. (<http://msauerborn.wix.com/theknooksproject#!knook-knowledge-/s5iaz>)

#KindergartenBioBlitz. This initiative is one that is intended to connect classes first to their place, and then to connect to other classrooms locally or globally. This inquiry provides a structure for teachers wanting to begin their exploration of local place, and is also suited to those who already are (Figure 13). It follows a week of exploration, each day asking a different question, culminating with Share Your Story on the last day.

#KindergartenBioBlitz

Connecting to Place

Kindergarten Bio Blitz offers a structure that can jumpstart your outdoor adventures.

Designed by Ranger Ridley, it offers a week of inquiry questions, and a platform to share your learning with other kindergarten classes on Twitter via #KindergartenBioBlitz

The week culminates with an invitation to share your story. We chose to build an iMovie that reflects some of our inquiry.



Figure 13. #KindergartenBioBlitz stories of sustainability with young learners.

(<http://msauerborn.wix.com/theknooksproject#!-kindergartenbioblitz-/tbhrm>)

This page has access to a unit plan detailing the curriculum links to the new BC Curriculum. It also includes a scope and sequence of the daily inquiries as they evolved in this classroom, resources, books, and samples of project pages (Figure 14, and Figure 15). It also introduces Twitter as a social platform tool for teachers to use to share stories of place with others (Figure 16).

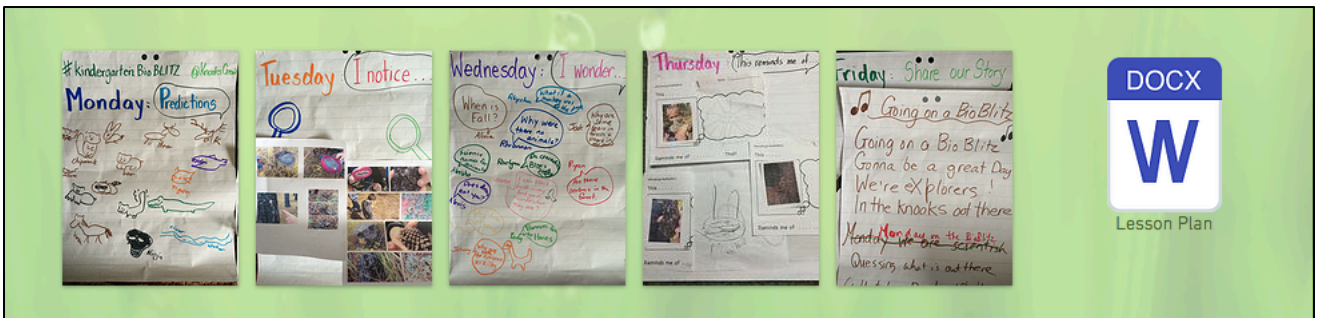


Figure 14. Visual representation of a week of inquiry questions.

(<http://msauerborn.wix.com/theknooksproject#!-kindergartenbioblitz-/tbhrm>)

| Lesson Plans | | | | |
|---------------------------|------------------|---|--|--|
| Lesson 1a Monday (inside) | Time | Teacher | Learner | Observations/ Assessments |
| Engage | 10 min | "Going on a Bear Hunt" Read Story "Going on a Bear Hunt" by Micheal Rosen and Helen Rosenbury | Oral language - Retelling with actions - Reflection of imaginary journey | Level of engagement Attention to text and story Participation |
| Interact | 10 min | #KindergartenBioBlitz Guiding Question: Predictions - Facilitate discussion on what we might find outside (in our Knooks) - Record responses on chart paper | Engage in partner talk Articulate own response Turn Taking Active Communication | Level of engagement Active listening characteristics |
| Explore | Free Choice Play | Introduce Play Options As a part of ongoing introduction of play choices in the room, focus on choices that reflect discussion: - Wild Animal Bin (collection of play animals based on local and global wild animals) - SeaShore Bin (collection of found items like seashells, rocks, driftwood etc) - Forest Floor (soil, mosses, pond) - Critter Bin (collection of plastic bugs, insects, reptiles) While students play, ask for a child to be a helping hand (aka Camera Kid) to take and post with you to Family Facebook a collection of photos related to the lesson (chart paper, play options, video) | Student can choose (or not:) to engage with the play choices | Assess prior knowledge Observe play interactions Observe social skills Record story structures Record vocabulary |
| Reflect | 10 Min | End of Day Routine Recap responses, add to based on play interactions | Camera Kid shares what has been posted via the Big Screen (ie: SmartBoard) | |

Figure 15. #KindergartenBioBlitz lesson plan sample

(<http://msauerborn.wix.com/theknooksproject#!/-kindergartenbioblitz-/tbhrm>)

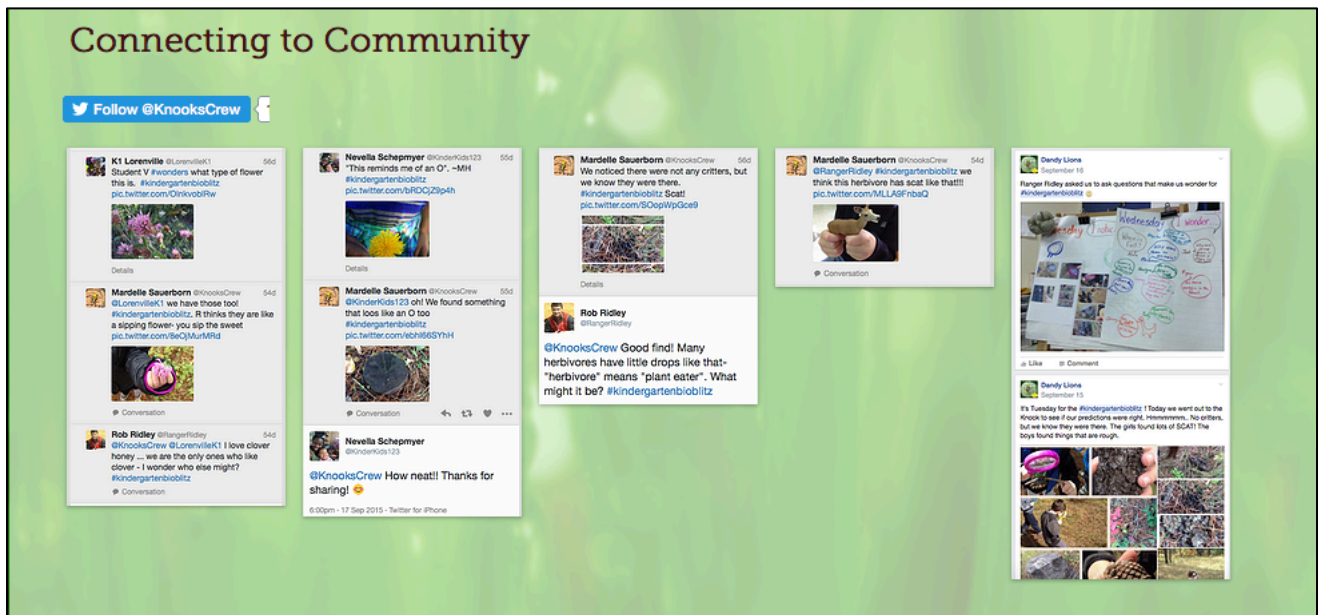


Figure 16. #KindergartenBioblitz twitter community examples.

(<http://msauerborn.wix.com/theknooksproject#!/-kindergartenbioblitz-/tbhrm>)

#KindergartenBioBlitz is repeated at different times through out the year, encouraging the building of relationships, and observing changes over time in our places. It happens in real time – children asking questions, posing solutions, exploring answers, and growing their curiosity and connection.

The manure. Education for Sustainability thrives when curiosity and inquiry are honoured. We grow in deep rich soil, fuels with fertilizer. Our practice is driven by research, and embedded in curriculum. This page houses the links to the curriculum documents, resource packages, and research required to support the choices we make when embedding place in our daily school experiences (Figure 17).

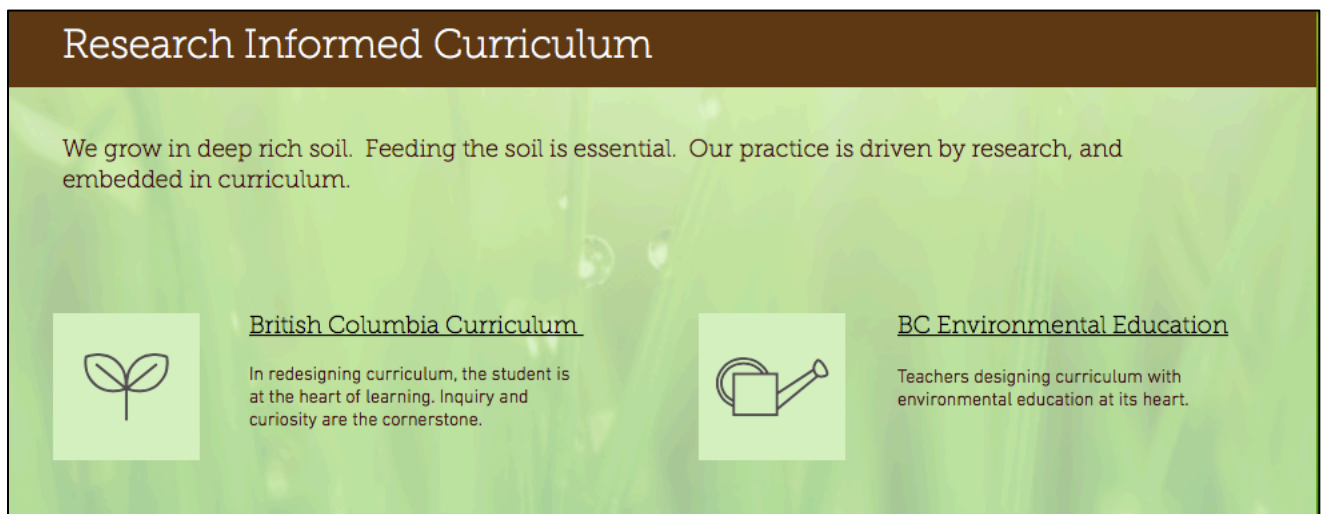


Figure 17. Research and Resources

(<http://msauerborn.wix.com/theknooksproject#!manure/cewg>)

Supporting Teacher Efficacy

Supporting this resource is the option for educators to access a synchronous workshop delivered online or in person. As suggested in Chapter One, this support workshop is suited to traditional professional development venues. The following figures (Figures 18-24) are a sampling of the slides from the presentation that anchor

the main concepts I outline. The slides presented are limited to the workshop as it relates to my vision. However, this workshop is designed to expand to accommodate a team presentation showcasing the diverse passions of the people in our school. The flexibility of this initiative has allowed for individuals to share their own vision and stories as we look to engage all students in place-based learning.



Figure 18. Kids Need Outdoor Opportunities for Knowledge of Sustainability.



Figure 19. Butterfly habitat – the importance of our place in the natural world.



Figure 20. Workshop: slide outlining guiding questions.



Figure 21. Workshop: reflection on impact of technology on young learners.

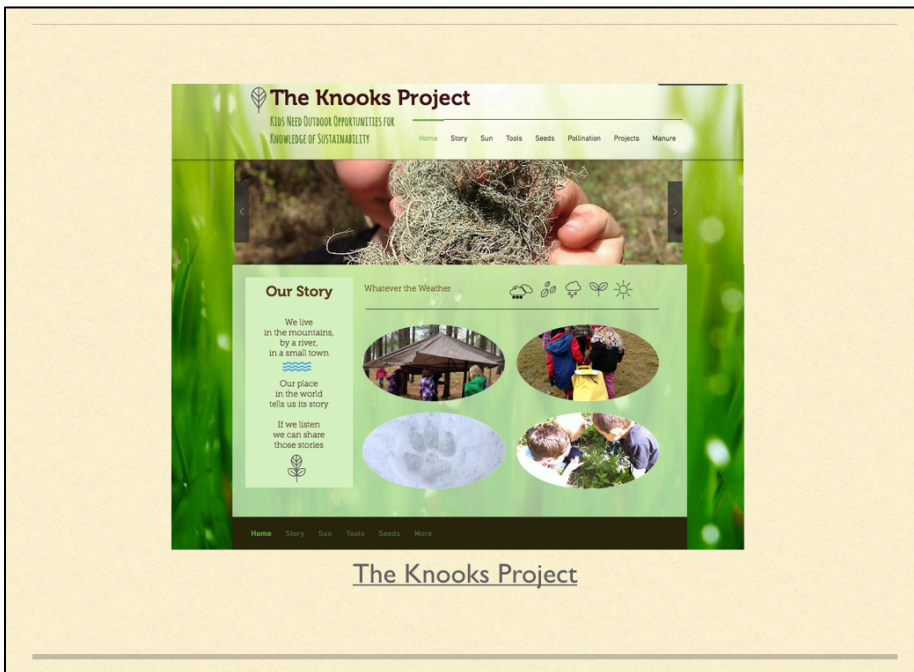


Figure 22. Workshop: image linked to website The Knooks Project



Figure 23. Workshop: image linked to video celebrating student voice.



Figure 24. Workshop: Final reflection image

Flexible connections. In exploring many different ways to connect teachers, I have come to see that flexibility in choice of platform, timing and access is essential for success. However, this can be re-imagined as a *conversation* rather than a sage-on-the-stage format. As we move away from that model with students, it is essential that teachers have the opportunity to engage on a personal level with others, sharing their stories, and building community.

As a result, the Connect page of the website becomes the simplest way to choose a way to start that conversation (Figures 25 - 28). Educators can choose to connect via a range of social media platforms. This range of platforms accommodates connecting one-on-one, as a small group, as a staff, or on a larger scale. Skype, Google Hangouts, and BlackBoard Collaborate are all familiar avenues to foster this collaboration.

Roots: Let's grow this

Connecting

I teach
My kids, other kids, maybe even your kids.

I learn
From my kids, your kids, grown up kids who teach too.

I chose
To teach kindergarten. For decades. On purpose.

I worry
About kids these days, the planet, our future. I get to be a grandma, and doesn't that change everything again.

I know
Kids these days have stories to tell, and a brave new way to tell them.

Let's talk.
Let's think less in terms of workshops and conferences, and more in terms of a *conversation*. As we move away from the Sage-on-the-Stage model with students, wouldn't it be lovely to engage on a personal level as educators?
So.
Pick your People: One on one, small crew, staff, whatever works for you.
Pick your Platform: Google Hangout, Skype, Blackboard Collaborate . . .
Pick your brains: lest sahere soem of that shiny brilliance with others.

Email me

Name

Email

Subject

Message

Twitter me

[Follow @learningmurd](#)

Twitter our K Crew

[Follow @KnooksCrew](#)

Skype me


 dandy.lions103

Figure 25. Contact and connect information for collaboration.

(<http://msauerborn.wix.com/theknooksproject#!connect/a99c1>)



Figure 26. Example of one on one connection with a small school via Skype.

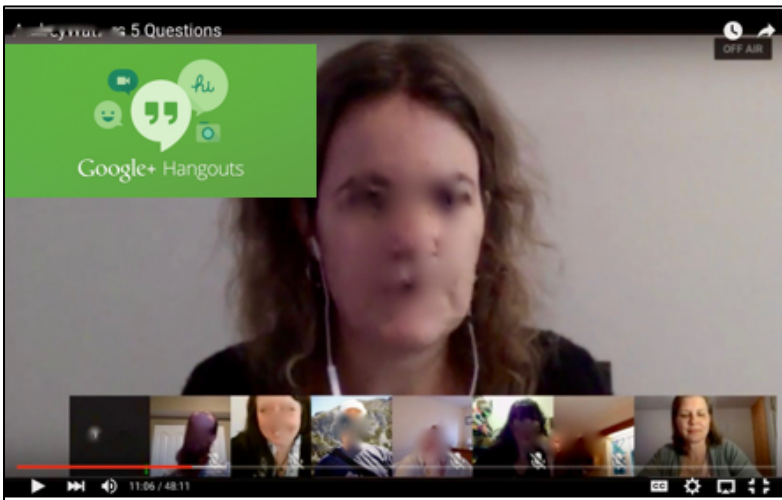


Figure 27. Connect: small group of educators via Google Hangouts.

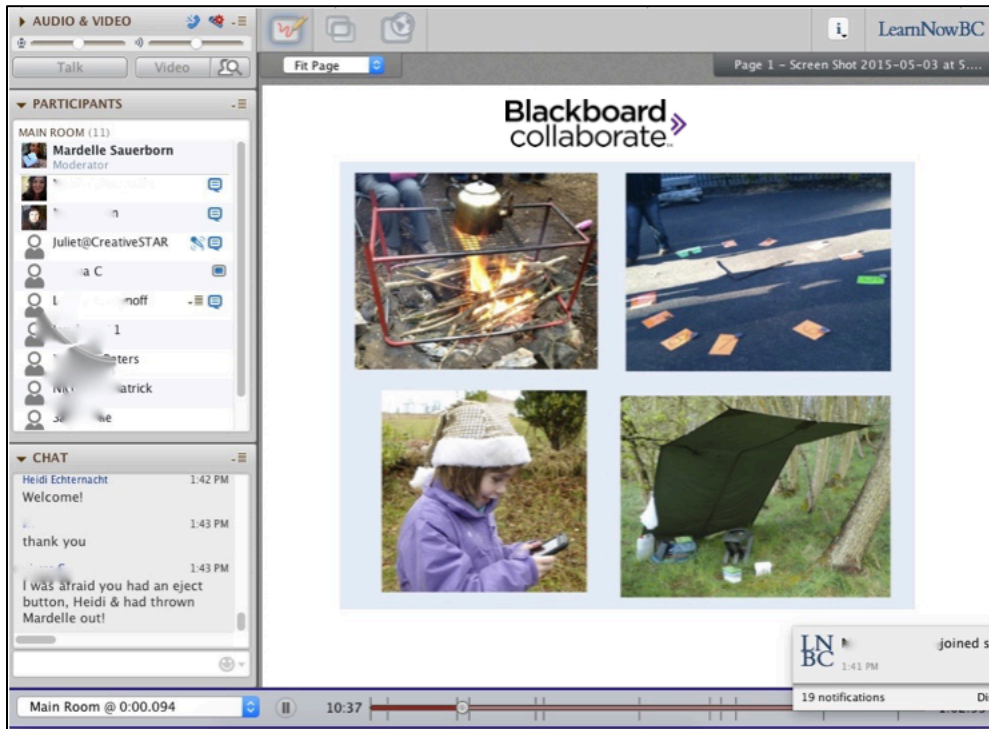


Figure 28. The Campfire Chat: Educators connecting via BlackBoard Collaborate. (<http://thecampfirechat.blogspot.ca>)

Conclusion. The purpose of my investigation into education for sustainability rests on determining what strategies may best support teachers as they instil proactive attitudes in young learners developing concepts of sustainability. I am hopeful that this resource, coupled with the opportunity for teachers to connect and build community, will serve to help educators embrace with the possibilities in shifting to a place-based inquiry model. As more educators re-imagine the role place-based learning has in their classrooms, innovative pockets of access will expand to create broader access to inquiry and place in our public schools.

Reflections

Summary of Project

My goal throughout the past few years has been to create something that respects the voices of our youngest citizens. In my readings, my research, and in my professional journey as a teacher, I have come to see that being in nature, playing in nature, exploring nature, is not the ultimate goal. The ultimate goal is connecting to place: where sustainability, stewardship, and advocacy can be nurtured, and where community can be built.

Remember that tiny redhead girl? She stomped her foot over cigarette butts. She also designed a butterfly habitat blueprint for our class chrysalis' to move into. The first thing she asked for was those workmen guys to come to the school. The ones with the tools and the wood.

“To build your habitat?” I said.

“Yep,” she said, “It needs a bench.”

“A bench for the butterflies?” I asked, a little perplexed.

“No,” she said. “A bench for *me*. Of course it needs to be big enough for me to be inside!”

You can't be outside looking in.

I wanted to build a culture of learning that makes it seamless for children to be outside, to nurture nature, and to share it out. Simply, I imagined a bench in an outdoor space, designed by a child, with access to the world.

Currently, educators are the last of the old guard that still sees technology innovations as new. The children we teach do not. As outlined in Chapter One, children do not see the manipulation of technology as conscious act, it is simply in their nature to pick up any tool - pencil, camera, or app - and use it to express their thinking.

There is a simplicity to being outside that can get lost in the realities of permission, risk, weather, and access. I cannot pretend that does not have a huge impact of the success of place-based learning. However, for my project I chose to ignore the how we get outside in favour of exploring the impact of what we do when we are there. I made a decision to push technology into places that traditionally is does not belong. This was not a comfortable decision for me. Inquiry is not comfortable. Change is not comfortable. I did find that I needed to limit my perceived impact of technology by focusing on collecting images and video in nature, leaving the bulk of the work of creating a digital story to inside the classroom. Place-based learning is so much more than being outside. It is creating community.

Professional Growth

Taking my masters so late in my career has been a blessing and a curse. I have jokingly referred to the literature review research phase of the journey as stages ranging from rage to dis-heartened to righteous indignation to epiphany. But after all of that, what has resonated with me is how the thinking that drives what I do is supported by research, is validated over time, and can be found living and growing in classrooms and schools everywhere. My beliefs were constantly validated, and my philosophies supported. This is unusual for teachers. Often we feel isolated, pressured to conform to some outside ideal of teaching. Often innovative teachers are seen to be under the

radar, or are seen as the cutting edge that is too challenging to emulate. It is true, the machinery that is public education creates massive challenges to engaging our learners in the kind of experiences that will honour the nurturing of citizens rather than rubber-stamping a successful worker. In the same way I hope to create community of learners in my care, I was able to become a part of a community of learners devoted to education for sustainability.

During my masters, the British Columbia Ministry of Education began to re-image our curriculum. As a result, many of the theoretical frameworks, philosophies, and core competencies that were emerging as essential for 21st century learners in my master's work, were being reflected in the design of the new curriculum. At the same time, I was accessing curriculum and policies from countries, such as Scotland, who recognized the importance of making quality outdoor experiences mandatory, our provincial policies and curriculum were open to debate. It was inspiring to see the voices of environmental educators united and raised to condemn the original drafts as being reductive rather than innovative regarding the curricular expectations for sustainable education. As a result, changes were made to embed concepts of sustainability to the language and expectation of our curriculum.

Another impact that this master's has had on me in terms of growth comes from the realization of how powerful a plan can be. Repeatedly, through out my course work and specifically the topic of one course, the impact design has on education in the 21st century continues to surface. What our learning spaces look like, where we choose to engage in learning, all point to place-based learning as a necessary component. How we structure investigations, how we build opportunity for tangents into the fabric of our

teaching matters. We need to ensure that where we learn allows for learners to touch, feel, fail, break, rebuild, and re-imagine our world. My mistake in the past has been to rely too heavily on the big picture, and sort the details as we came to them. Looking at inquiry through the eyes of a designer helps me to see the structure supports creativity, rather than constricting it. Additionally, it creates a common language to share ideas with other educators.

My thinking is messy. It can be challenging for me to articulate what we have done in a way that others in my community can connect to. I have been guilty of advocating for the importance of building community with my learners, but neglecting to access my own community of educators. That isolation is liberating, but limiting. If the goal is to create connected, active citizens, I need to be one.

Professional Implications and Sharing to Community

As a teacher, I found myself happily curled up under my own rock. Certainly, I was engaged in innovative projects, was constantly searching for that path that was best for my students. I was even branching out and sharing to a global audience via twitter communities, structuring global play projects, and by organizing webinars and seminars that had me interacting with teachers on every continent. However, as a professional, what was lacking was my own connection to place. Specifically: the community of educators in my own school. When I started looking in my own backyard, the impact of local, community-based action was personal, and more powerful. Working through this cemented the need for me to be as engaged in my version of place as I was offering to my students. My graduate experience opened the door to looking locally for inspiration locally. This will no doubt sound trivial, but it truly is at the heart of

a huge shift in thinking for me. Once we (instead of me) began sharing the possibilities for simply being outside, the strengths and passions of the school community began to emerge, as it does in classrooms open to inquiry. The Knooks project is taking on dimensions that I could dream as possible, but could not breathe life into. On our staff, these passions are being realised through projects engaged in physical literacy, art, math, community gardening, local food initiatives and sustainability issues as more of us use the outdoor spaces. Place is shaping many stories. As we continue to grow the Knooks concept at our school, we are building a district conversation. Inspired by professionals in this very cohort that is TIEGrad, creating community online is becoming a viable focus.

Recommendations

My recommendations for anyone beginning this journey are straightforward.

Do it. By all means, research, read, observe, plan, and organise. However, nothing can take the place of repeated, informal engagement with places in your community. Step out the door. And then step out again and again. You might choose to set a goal of being outside a third of the day by spring. This is how our first “real” year of place-based inquiry worked. However, prior to that it was years of walks in the woods, and playing in a backyard garden. Try an hour a week, or ten minutes tomorrow. Enjoy it. The excursions will guide what you do and the directions that you go.

Follow your passion. Explore place through your own lens. Children are inspired by those whose eyes light up when they teach. We sometimes bury our own passions to accommodate those of our learners. This is a disservice to you and them.

Explore place through art, music, action, or stillness. Explore place as a scientist, a mathematician, a playwright, or as a citizen.

Share it. Tell your stories, celebrate your wonder. Whenever we are out and about and are gathering together to share our thinking, I invite the kids to gather at the campfire (*Figure 29*). Often it is simply a circle of rocks, or one that is imagined. The emotions it evokes, the sense of community, familiarity, and connection it fosters is powerful. I chose to look for digital campfires to honour student voice. Your anchor for sharing out will be related to your passions.



Figure 29. Gathering around a campfire fosters reflection.

Keep your perspective. Sometimes we get pretty wound up. I was blessed to have a practical and wise mother. In closing, I share some of her wisdom.

“Whatever, whatever, tada tada. Just always have fun” (May Hunter, 2015).

References

- Blenkinsop, S. (2012). Four slogans for cultural change: an evolving place-based, imaginative and ecological learning experience. *Journal of Moral Education*, 41(3), 353–368. <http://doi.org/10.1080/03057240.2012.691634>
- Brenner, J. C., Hamilton, J. G., & Drake, T. (2013). Building local environmental knowledge in undergraduates with experiential wilderness skills and awareness training : the case of environmental sentinels. *Journal of environmental studies and sciences*, 3(4), 404–415. <http://doi.org/10.1007/s13412-013-0145-9>
- British Columbia Ministry of Education. (2011). *BC's Education Plan*. Retrieved from http://www.bcedplan.ca/assets/pdf/bc_edu_plan.pdf
- Bruner, J. (1966, 2013). Man: A Course of Study. In D. Flinders & S. Thornton (Eds.), *The Curriculum Studies Reader* (pp. 79 - 93). New York: Routledge.
- Chawla, L., Keena, K., Pevec, I., & Stanley, E. (2014). Green schoolyards as havens from stress and resources for resilience in childhood and adolescence. *Health & Place*, 28, 1–13. <http://doi.org/10.1016/j.healthplace.2014.03.001>
- Chiarotto, L. (2011). *Natural curiosity: Building children's understanding of the world through environmental inquiry*. Oshawa: Maracle Press Ltd.
- Conference, U. N. (2013). Declaration of the United Nations Conference on the Human Environment. *The United Nations Conference on the Human Environment*, (June 1972), 1–4.
- Davis, A., & Weinschenker, D. (2012). Digital Storytelling and Authoring Identity. In C. C. Ching & B. J. Foley (Eds.), *Constructing the self in a digital world* (Chapter 2). <http://dx.doi.org/10.1017/CBO9781139027656.005>
- Davis, J. (2014). Examining early childhood education through the lens of education for sustainability: Revisioning rights. In Davis, J. & Elliot, S. (Eds.). *Research in early childhood education for sustainability: International perspectives and provocations* (p. 21-37). Oxon: Routledge
- Davis, J. (Ed.). (2010). *Young children and the environment: Early education for sustainability*. Melbourne: Cambridge University Press.
- Davis, J. & Elliot, S. (Eds.). (2014). *Research in early childhood education for sustainability: International perspectives and provocations*. Oxon: Routledge

- Dewey, J. (1902). The School as Social Center. *The Elementary School Teacher*, 3(2), 73–86. Retrieved from <http://www.jstor.org/stable/992485>
- Egan, K. (1983). Educating and Socializing - a Proper Distinction. *Teachers College Record*, 85(1), 27–42. Retrieved from <https://www.sfu.ca/~egan/read823/Edsoc.html>
- Egan, K. (1989). *Teaching as story telling: an alternate approach to teaching curriculum in the elementary school*. Chicago: University of Chicago Press.
- Elliot, E., Eyke, K., Chan, S., Ulrich, M. (2014). Taking kindergartens outdoors: Documenting their explorations and assessing the impact on their ecological awareness. *Children, Youth, and Environments* 24(2). 102-122. Retrieved from <http://www.jstor.org/journal/chilyoutenvi>
- Environmental Educator's Provincial Specialist Association, BC Hydro & BC Ministry of Education, (2008). *The Environmental Learning & Experience Curricular Maps*. Retrieved from http://www2.gov.bc.ca/assets/gov/education/kindergarten-to-grade-12/teach/teaching-tools/environmental-learning/ele_maps.pdf
- Fägerstam, E. (2012). Children and Young People's Experience of the Natural World: Teachers' Perceptions and Observations. *Australian Journal of Environmental Education*, 28(1), 1–16. <http://doi.org/10.1017/ae.2012.2>
- Freire, P. (1979, 2013). *Pedagogy of the Oppressed*. In D. Flinders & S. Thornton (Eds.), *The Curriculum Studies Reader* (pp. 157 - 165). New York: Routledge.
- Freire, P. (2005). *Pedagogy of the oppressed*. (M. B. Ramos, Trans.). New York: The Continuum International Publishing Group Inc. (Original work published 1970).
- Gangan, N. (2014). Blending Creativity and Technology : Digital Storytelling in Education. *International Journal of Science and Research*, 3(10), 1787-1790. Retrieved from <http://www.ijsr.net/archive/v3i10/TONUQTQ0MDg%3D.pdf>
- Goleman D., Bennet, L., & Barlow, Z. (2012). *Ecoliterate: How educators are cultivating emotional, social, and ecological intelligence*. San Francisco: Jossey-Bass.
- Hare, J. (2011). "They tell a story and there's meaning behind that story": Indigenous knowledge and young indigenous children's literacy learning. *Journal of Early Childhood Literacy*, 12(4), 389-414. <http://doi.org/10.1177/1468798411417378>
- Huckle, J. (2014). Education for Sustainability : Assessing Pathways to the Future. *Australian Journal of Environmental*, 30, 31–50. <http://doi.org/10.1017/ae.2014.21>

- Hung, C.-M., Hwang, G.-J., & Huang, I. (2012). A Project-based Digital Storytelling Approach for Improving Students' Learning Motivation, Problem-Solving Competence and Learning Achievement. *Journal of Educational Technology and Society*, 15(4), 368–379.
- Inoue, M. (2014). Perspectives on early childhood environmental education in Japan: Rethinking for a sustainable society. In Davis, J. & Elliot, S. (Eds.). *Research in early childhood education for sustainability: International perspectives and provocations* (p. 96). Oxon: Routledge
- Johnson, J. T. (2012). Place-based learning and knowing: Critical pedagogies grounded in Indigeneity. *GeoJournal*, 77, 829–836. <http://doi.org/10.1007/s10708-010-9379-1>
- King, T. (2003). *The truth about stories: A native narrative*. Toronto: House of Anansi Inc.
- Kozak, S. & Elliot, S. (2014). *Connecting the dots: Key strategies that transform learning for environmental education, citizenship, and sustainability*. Oshawa: Maracle Press Ltd.
- Lloyd, M. (2010). The world is flat: ICT and education for sustainability in the early years. In Davis, J. (Ed.). *Young children and the environment: Early education for sustainability* (p. 214-241). Melbourne: Cambridge University Press.
- Louv, R. (2005). *Last child in the woods: Saving our children from nature-deficit disorder*. North Carolina: Algonquin Books of Chapel Hill.
- Louv, R. (2011). *The nature principle: Reconnecting with life in a digital age*. North Carolina: Algonquin Books of Chapel Hill.
- Lynch, J., & Redpath, T. (2012). “Smart” technologies in early years literacy education: A meta-narrative of paradigmatic tensions in iPad use in an Australian preparatory classroom. *Journal of Early Childhood Literacy*, 14(2), 147-174. <http://doi.org/10.1177/1468798412453150>
- Mannion, G., Mattu, L. & Wilson, M. (2015). Teaching, learning, and play in the outdoors: a survey of school and pre-school provision in Scotland. *Scottish Natural Heritage Commissioned Report No. 779*.
- Merchant, G. (2015). Keep taking the tablets: iPads, story apps and early literacy. *Australian Journal of Language and Literacy*, 38(1), 3–12. Retrieved from <http://www.alea.edu.au/resources/australian-journal-of-language-and-literacy-ajll>

- Noddings, N. (2013). Curriculum for the 21st Century. In D. Flinders & S. Thornton (Eds.), *The Curriculum Studies Reader* (pp. 399 - 405). New York: Routledge
- ParticipACTION. The Biggest Risk is Keeping Kids Indoors. The 2015 ParticipACTION Report Card on Physical Activity for Children and Youth. Toronto: ParticipACTION; 2015. Retrieved from <http://www.participaction.com/wp-content/uploads/2015/03/2015-Report-Card-Full-Report-EN-FINAL.pdf>
- Pievani, T. (2014). The sixth mass extinction: Anthropocene and the human impact on biodiversity. *Rendiconti Lincei*, 25(1), 85–93. <http://doi.org/10.1007/s12210-013-0258-9>
- Phillips, L. (2014). I want to do real things. In Davis, J. & Elliot, S. (Eds.), *Research in early childhood education for sustainability: International perspectives and provocations* (p. 194-207). Oxon: Routledge
- Polito, T. (2005). Educational theory as theory of culture: A Vichian perspective on the educational theories of John Dewey and Kieran Egan. *Educational Philosophy and Theory*, 37(4), 475–494. <http://doi.org/10.1111/j.1469-5812.2005.00136.x>
- Ribeiro, S. (2015). Digital storytelling: An integrated approach to language learning for the 21st century student. *Teaching English with Technology*, 15(2), 39–53. Retrieved from <http://www.tewtjournal.org>
- Rich, N. (2012). Why link indigenous ways of knowing with the teaching of environmental studies and sciences? *Journal of Environmental Studies and Sciences*, 2(4), 308–316. <http://doi.org/10.1007/s13412-012-0098-4>
- Rockström, J., Steffen, W., Noone, K., Persson, Å., Chapin, F. S., Lambin, E., ... Foley, J. (2009). Planetary boundaries: Exploring the safe operating space for humanity. *Ecology and Society*, 14(2): 32. <http://doi.org/10.1038/461472a>
- Sageidet, B. (2014). Norwegian perspective on ECEfS: What has developed since the Bruntland Report? In Davis, J. & Elliot, S. (Eds.). *Research in early childhood education for sustainability: International perspectives and provocations* (p. 112-124). Oxon: Routledge
- Simsek, E., & Simsek, A. (2013). New Literacies for Digital Citizenship. *Contemporary Educational Technology* 4(2), 126–137
- Steffen, W., Persson, Å., Deutsch, L., Zalasiewicz, J., Williams, M., Richardson, K. Svedin, U. (2011). The anthropocene: From global change to planetary stewardship. *Ambio*, 40(7), 739–761. Retrieved from <http://doi.org/10.1007/s13280-011-0185-x>

Truong-white, H., & Mclean, L. (2015). Digital Storytelling for Transformative Global Citizenship Education Résumé. *Canadian Journal of Education*, 38(2) 1-28. Retrieved from <http://cje-rce.ca/index.php/cje-rce/article/view/1756/1757>

United Nations Children's Fund. (2013). Sustainable development starts and ends with safe, healthy and well-education children, (April 2013), 1–22.

UNESCO, (2014). *Proposal for a global action programme on education for sustainable development as a follow-up to the United Nations decade for education for sustainable development (DESD) after 2014*. Paris, 2014. Retrieved from <http://unesdoc.unesco.org/images/0022/002243/224368e.pdf>

Wohlwend, K. E. (2015). One Screen, Many Fingers: Young Children's Collaborative Literacy Play With Digital Puppetry Apps and Touchscreen Technologies. *Theory Into Practice*, 54(2), 154–162. <http://doi.org/10.1080/00405841.2015.1010837>

Zorzi, R. & Gagne, M. (2012). Youth Engagement with Nature and the Outdoors. Retrieved from http://www.davidsuzuki.org/publications/downloads/2012/youth_survey_findings_summary.pdf