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# From the Editor's Desk

I am pleased to share the latest issue of *Early Childhood Education* with you, which includes important research and writing focused on diversity across local as well as broader communities. This issue includes four new articles and three reprints from other ATA specialist council publications. It is exciting to see such interesting research being done and shared with the greater early childhood education community. I hope that these articles provide you with food for thought and new learning.

In her article, "Using a Living Literacies Approach with Young Children with Disabilities," Amanda Rintisch discusses how connecting literacy to students' lived experience helps them to understand and appreciate literacy. This was done with a critical literacy approach and focused on marginalized groups, especially those children with disabilities.

In their article, "Culturally Sustaining Pedagogies in Literacy: Two Early Childhood Educators' Classroom Perspectives," Amy Porter and Natasha Bobyak examine early childhood classrooms through a postmodern view where they believe that each student needs to be considered as a unique individual within the social context in which they are situated. Porter and Bobyak found three problems in their prekindergarten classrooms—a lack of technology being used with young learners, English-dominated practices as well as the heavily influenced Euro-Western literature used in classrooms—and believe that these can be addressed through culturally sustaining pedagogies.

Linda Reichenauer, in her article "Grandparents and Grandchildren in Canadian Picture Books," discusses children's literature that focuses on multigenerational and skip-generation households. She reminds us of the importance of including children's literature about diverse family structures. In her research, Reichenauer considers how schools can provide help to grandparents and grandchildren living in skip-generation families and gives examples of skip-generation picture books as well as provides an annotated list of picture books about grandparents and grandchildren published in Canada.

The last new article entitled "Considering the Spirit and Ethical Imperative in Establishing Classroom Contexts" comes from Janine Chesworth and Patricia Steinhauer. In their submission, Chesworth and Steinhauer examine the new Alberta Education competencies, specifically competency 5, which asks educators to apply foundational knowledge about First Nations, Métis and Inuit to their teaching. They note that this competency emphasizes "knowledge about" Indigenous Peoples rather than Indigenous Peoples' knowledge systems. The authors suggest that this can be done more successfully by incorporating and weaving in Indigenous ways of knowing, teaching and learning. Furthermore, they suggest that educators and special education consultants should integrate Indigenous thought systems and ethical constructs into their practices and pedagogies to create more balanced and thoughtful early learning classroom spaces for all children.

The reprints in this volume focus on early childhood articles from three specialist councils: Global, Environmental & Outdoor Education Council, Mathematics Council and Science Council. First is an interview of Abi Henneberry by Alison Katzko entitled "Daily Outdoor Exploration in a Kindergarten Class." Next is an article, by Nicole Langevin, Miwa A Takeuchi, Jenny Yuen and Shayla Jaques, called "Enriching Geometric Understanding Through Early STEM Pedagogy." And the last reprint entitled "Ways of Reflection: Becoming Reflective Science Educator" is by Poh Tan.

All articles in *Early Childhood Education* are peer-reviewed by our dedicated reviewers. We appreciate their ongoing constructive feedback to maintain the quality of this journal.

This issue is my last as editor. Thank you for all your support over the last three years. I hope you enjoy the 2023 issue of *Early Childhood Education!*

*Sherry Woitte*
*University of Alberta*

# Using a Living Literacies Approach with Young Children with Disabilities

*Amanda Rintisch*

*Amanda Rintisch has been teaching in early childhood education for 13 years. She recently completed her master of education at the University of Alberta.*

I have taught in early childhood education for over a decade and have seen educational theories shift and change, sometimes drastically. Over time I have learned to adapt and accommodate the best of what I find in varying approaches while not allowing myself to be swept away by waves of drastic change. I have found that the living literacies approach interweaves beautifully with my existing strengths-based early childhood theory and child-centredness approach. Using the idea of living literacies, I will explore how to centre and honour students' living literacies. This will lead to discussing how best to support and scaffold the learning of additional literacies for students in an early childhood setting.

## The Living Literacies Approach

The book *Living Literacies: Literacy for Social Change* (Pahl et al 2020) gave me language and clarity for something I had been intuiting pieces of in my interactions with students and their families. The strengths-based focus of early childhood education programs I have worked with skimmed the surface of the idea that children come to us with their own skills and methods of meaning making. Pahl et al (2020) call a living literacies approach one that begins by looking at all the ways people make meaning as they go about their daily lives; that "living literacies involves being in and of the world." Yeats (1962, as cited in Pahl et al 2020) described it as not being able to separate what people are doing from how, when, where and under what conditions they are doing it. While Street (1984, as cited in Pahl et al 2020) saw that literacy was not a separated set of skills that contained no meaning, instead literacy was located within social practices, which meant they have social meaning. They even saw social activities as literacy practices, which meant literacy is always ideologically situated.

Traditionally, literacy has been framed as being performative, communicational and informational, as dispassionate skills to be mastered. In this approach, literacy also encompasses that which is felt, sensed, dynamic and varied in settings and context. Pahl et al (2020) saw literacy as being too important to be reduced to a simple set of skills partly because this creates and endorses a classed and racialized idea of what counts as literacy. When literacy is defined as a set of skills mostly held by the ruling culture and class, then the activities of marginalized groups are not counted as literacy. This is played out in classrooms with many marginalized groups, including students with disabilities.

## Nontraditional Skills Are Skills

While in a classroom, I witnessed the narrow parameters of what counts as literacy. The students were given a traditional spelling test where they were told words to print on their paper. Many of the students in this class had fine motor delays ranging from mild to severe, so for them printing was extremely difficult and typically resulted in behaviours escalating during any writing activity. The student I was assigned to help alternated between struggling greatly to print illegible letters to refusing and throwing their pencil. I knew this student was a gifted reader, so I retrieved some letter tiles, gave them to the student and asked them to spell each word. They quickly spelt every word on the list correctly. When I explained to the teacher how successful the student was with the accommodation, I was told that it didn't count if they "don't print the words." The living literacies view challenges this gatekeeping of literacy and the "implicit bias that treats students who do not speak or

write standardized versions of literacy and language as 'other'" (Pahl et al 2020).

Similar discounting of students' crafted knowledge is seen in the many examples of nonspeaking students' methods of communication being dismissed or at least seen as less valuable than traditional forms of speaking and writing. Finnegan (2015, as cited in Pahl et al 2020) drew attention to the value of ways of knowing which are not traditional but are some combination of gesture, vocalizations, mark making and the like. I have witnessed dozens of nonspeaking students communicating clearly and seamlessly with their caregivers, friends, teachers and family in nontraditional ways. A certain vocalization is known to say, "I'm upset"; a facial expression communicates, "I'm having fun"; a gesture tells, "I want that." Pahl et al (2020) refer to children running in circles as a form of "embodied mark making," and this is also true of an autistic student's hand-flapping and jumping that communicates joy, or an anxious student's twisting of their shirt that communicates fear. These forms of languaging are typically discounted and viewed as needing to be replaced by traditional methods such as writing and speaking. I am embarrassed to admit the number of times I have assumed incompetence in a child who does not meet traditional standards.

Kendi (2016, as cited in Pahl et al 2020) asked if we could measure literacy by the skills a person uses to navigate their environment in all the verbal and nonverbal ways, and I say we can. To do so, however, we will need to "reconstitute how knowledge structures are developed" and acknowledge "ways of knowing that do not honour people's crafted understandings risk undercutting and disempowering their knowledge" (Pahl et al 2020). By adjusting a comprehensive view of literacy to include, as Olson (2009, as cited in Pahl et al 2020) did, any and all "intentionally created visual mark or artefact that affords communication and expression" (Dowdall 2019, 258), the gestures, vocalizations and body language of children who do not speak in traditional ways would be considered with equal weight to the speaking and writing of their peers. While recently painting with a minimally verbal student, I noticed she was making many dots with long lines under each. I asked her to tell me about what she was painting. She pointed to the marks and through gestures and facial expressions told me they were sad, crying eyes. She then painted two dots with a circle underneath. Again, she used facial expressions and vocalizations to tell me it was a surprised face. Though she did not speak in any traditional sense, and most people would not have been able to decipher her mark making on its own, she was successfully demonstrating literacy skills and emotional intelligence. This painting incident, though it lacks any traditional speech or writing, would count as a literacy event (Heath 1983, as cited in Pahl et al 2020) with text (the marks made with paint) and talk around that text (the communication through her vocalizations and gestures) providing interpretation.

## Read-Alouds

This view of living literacies can be applied to a range of literacy activities. Moffatt, Heydon and Iannacci's (2017) study on read-alouds in classrooms documented a vast difference between the validation some children received for their responses during read-alouds and the invalidation other children received. Often only students who are quiet until called on, who answer questions correctly and are not overly excited, are validated when they respond during read-alouds (verbally or nonverbally). This is also seen in classrooms with children with disabilities. Typically, only the students who sit quietly and look at the book are praised and engaged with by the teacher. There are, however, other ways of engaging in read-alouds that are equally valid. Some students prefer to sit physically removed from the group yet are still attending to the book. Some students will not look directly at the book but are listening closely. Other children do a variety of other activities (such as fidget toys, colouring or even jumping on a small trampoline) during a read-aloud yet are still engaging with the text being read. These responses to read-alouds and other literacy activities are often invalidated, or even punished, in the classroom as not being the correct behaviours. The fact that engaging in literacy can look and sound different for every child is one that requires significantly more attention.

## Supporting Meaningful Learning

Every child comes into our classroom with their own unique set of literacies. As a result, they require our professional assistance in filling gaps in their knowledge and skills. If we are able to meet this challenge, it will help them become "literate individuals who have the capacity and will to understand and act on their worlds with and against text, in ways that vary according to their contexts and communities" (Barton and Hamilton 2005, as cited in Aukerman and Schuldt 2021). This does not have to look like every child being measured against the same traditional standards of literacy. Instead, policy-makers and educators can choose to focus on how literacy instruction can best help a student flourish as a literate being in ways mattering most to them.

Aukerman and Schuldt (2021) observed, "Because literacy is socially, culturally, and historically situated, what counts as good reading (or as good instruction) is equally social, cultural, and historical" (p S86). In my class of students, containing nonspeaking, minimally speaking English language learners and students with apraxia,

good reading and good literacy instruction looks significantly different for each child. The concept of textual dexterity is a useful approach to what instruction and success for each student can look like. Textual dexterity "encompasses all capacities that allow readers to access, understand, use, and scrutinize text for purposes that matter to them" (Aukerman and Schuldt 2021, S87). These literacies can be profoundly different from each other, yet they each involve teaching and supporting students to engage with literacy in ways meaningful to them. Expecting a typically developing child to only communicate through an AAC (augmentative and alternative communication) device is as ridiculous as it is to expect a nonspeaking student to only communicate through verbal language. Rather than expecting all students to achieve the same literacy goals, this approach values the different types of textual dexterity students will achieve according to their identity and their context.

Woods and Exley (2019) posit that to engage in effective literacy education, students should be "explicitly taught to activate prior knowledge and draw inferences" (p 7). This text participation, making meaningful connections between background knowledge and the text, is a key component in supporting students' literacy development. To begin with, texts which are relevant and meaningful to students' lived experiences and interests should be used so the act of connecting to the material is clear and easier to practise. This requires teachers to curate a classroom library that reflects students' identities and interests. Recently in my classroom a student began talking about volcanoes all day every day. Another student only wanted to talk about dinosaurs, so we combined the two. We began a month-long exploration of dinosaurs and volcanoes. Both students were eager to share their extensive knowledge, show their peers how to draw dinosaurs and volcanoes, as well as create them out of playdough. Utilizing topics that mattered to these students engaged them in a variety of literacy and textual activities that were highly motivating and meaningful to them.

# Conclusion

Living literacies and the methods of literacy instruction, which utilize the concept, are a natural fit for early education classrooms using a strengths-based, child centred approach. By examining my classroom practice through this lens, I have begun to see the places where my current methods already overlap with this theory as well as the incongruencies. Examining our practice and pedagogy with a critical lens is essential to continued professional development and the success of our students.

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# Culturally Sustaining Pedagogies in Literacy: Two Early Childhood Educators' Classroom Perspectives

*Amy Porter and Natasha Bobyak*

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*Natasha Bobyak, MEd, is a teacher in the greater Edmonton area. She has experience in kindergarten and prekindergarten classroom settings. Her studies at the University of Alberta focused on early childhood curriculum and pedagogy.*

Early childhood is a beautiful place to be an educator; the curiosity, determination and joy of young learners are inspiring, as anyone who has had the opportunity to be a part of this profession knows. We have taught in early learning classrooms for a combined experience of over 20 years, many of these years within a specialized early intervention prekindergarten program. In the last few years, we have noticed that early childhood education is beginning to recognize what marginalized peoples have known for a long time: our education systems are designed to support the learning and identities of the dominant culture. Our graduate studies have helped us recognize and articulate our limited perspectives; as white, middle-class, heterosexual, cisgendered, monolingual women, our literacy pedagogies need to account for social change. Classrooms are becoming more diverse, and educators like ourselves must adopt pedagogies that recognize and value this increasing diversity (Sleeter 2001, as cited in Miller and Wells Rowe 2019, 325).

Our classroom pedagogies share a postmodern view; we believe that each student needs to be considered for the unique individual they are within the social context in which they are situated. This perspective acknowledges that there is more to early childhood education than the developmental psychology-based, scientific worldview that dominates our Western modern society. "Postmodern thinkers … [interrogate] the appropriateness of general world views that are applied to all human beings" (Appleby, Hunt and Jacob 1994, as cited in Cannella 1997, 13). Our understanding of literacy is well stated by Aukerman and Chambers Schuldt (2021, 86): "Students' experiences with text involve other people and situated contexts, and the social, cultural, and cognitive dimensions of those experiences all matter." Within this philosophy, we recognize that our classrooms are at risk of perpetuating dominant cultural values at the expense of the rich and diverse experiences of multilingual and multicultural students in our communities.

In this paper, we will briefly explain why early learning classrooms need culturally sustaining pedagogies, and we will share three problems we found in our prekindergarten classrooms: a lack of technology being used with our young learners, our English-dominated practices as well as the heavily influenced Euro-Western literature used in our classrooms. We will then outline three strategies that could be used to support culturally sustaining pedagogies and include some examples of successful implementation within our prekindergarten classrooms. These strategies include the intentional integration of digital literacy skills and technology, utilizing the strategy of translanguaging and incorporating diverse read-alouds.

# Why Do Classrooms Need Culturally Sustaining Pedagogies?

In our own lives, we use literacy in many ways: we read books, use social media, play video games, watch and read recipes, navigate street signs, listen to podcasts and stream videos just to name a few. Culturally sustaining pedagogies are essential to our literacy practices because they recognize that "literacy is lived deeply and richly across communities" (Rowsell and Pahl 2020, 7). The lives of the children in our classrooms are increasingly complex, due to differences in languages, family structures and cultures. As Valdes (1996) and Heath (1986) have found, "There are cultural discontinuities between the children's culture and that of the school" (as cited in Blum-Martinez 2007, 132). In our pedagogies, we can identify three places where these discontinuities are present.

## Lack of Technology in Early Learning Classrooms

As educators, it is important to recognize the shift of literacy into a digital world and honour the fact that "digital literacy is a social practice" and "even the youngest children engage in digital literacies" (Sefton-Green, Marsh, Erstad and Flewitt 2016, as cited in Oakley 2019, 202). As demonstrated by Flewitt (2021), children learn digital literacy skills from their families and come to school equipped with digital skills that go beyond the early literacy skills of reading and writing with paper and pencils. Previously in our classrooms, we had abstained from using technology with our young learners, thinking that students already had so much access to screen time and digital devices at home. However, when teachers avoid technology in their practice, it contributes to the disconnect between literacy experiences children engage in at home and literacy activities and experiences at school. As explained by Pahl and Rowsell (2012, 59), "Diverse literacies at home can be used in school and merged with school literacy to create successful literacy learning." As educators, we can harness our students' strength in digital literacy by using technology in our early learning classrooms.

## English as the Language of Instruction and Power

Murillo (2012) explains that schools in the United States privilege English as the language of instruction and power (as cited in Miller and Wells Rowe 2019, 325). Anecdotally, this context is fitting in our early learning classrooms as well. Especially in early childhood classrooms where students are screened for speech-language delays or assigned English as a second language (ESL) funding grants (Alberta Education 2022, 41–42), English language learning is not only the expectation but how success is measured. For example, to gain access to early intervention, children are screened using a standardized assessment or, if their home language is not English, a similar screener. If a language deficit is identified, then a set of goals based on English language acquisition or communicative modalities are outlined by the school and guardians. At the end of the school year, progress is measured with another standardized test or through evidence of progress based on goals. This framework inherently reinforces the placement of English as the language of power. Contexts become especially complex for students who are multilingual and are identified as having speech-language, reading or writing delays. The literacy experiences of students in our classroom are more complex than their progress in English literacy skills can measure. A shift in focus is needed to honour the whole child's literacy development.

## Euro-Western Literacy Materials

Within reading and writing instruction, we can discover the urgent need for diversity. Typically, school and classroom libraries mostly contain materials that reflect the voices, thoughts and experiences of authors who belong to the dominant culture. In their research, Crisp et al (2016) examined books in 21 preschool classroom libraries in Atlanta, Georgia, and found that "books in classroom libraries were lacking in terms of cultural diversity" (p 38). Crisp et al (2016, 29) describe how "the world depicted in children's books is overwhelmingly white … predominately upper middle class, heterosexual, nondisabled, English-speaking, and male." Similarly, in 2021, Mount Allison University conducted an audit of every picture book at Sackville Playschool. Overall, it was discovered that out of the four thousand picture books reviewed, most portrayed characters of white, nuclear families and more books featured animals than people of colour or diverse ethnicities (Blanch 2021, para 2). The lack of diverse resources available to educators and students leads to missed opportunities for our classrooms to relate to the realities of our students' home lives and how their families use and find joy in literacy. The literacy practices in our classroom need to employ pedagogies that intentionally bring students "funds of knowledge" (Moll, as cited in Pahl and Rowsell 2012, 71) to the forefront. As explained by Massing, Kirova and Hennig (2013), the concept of funds of knowledge recognizes how "children learn culturally valued knowledge and skills in the course of their daily lived experiences in familiar and community contexts" (p 6). Focusing on the dominant culture within our classroom literacy materials excludes many of our learners. "When teachers make a focused effort to change practices that might exclude or pose difficulty for some children, they benefit all children" (Laidlaw and So-Har Wong 2013, 113). Culturally sustaining pedagogies offer the first steps for educators looking to make these changes.

# Strategies to Support Culturally Sustaining Literacy Practices

After discovering cultural discrepancies in our teaching practices, we found ourselves ready to take steps toward more culturally equitable classrooms; for educators who wish to value each child's unique culture will "use culturally appropriate pedagogies to create liberating learning environments" (Trueba and Zou 1998, as cited in Smrekar 2007, 173). While we recognize that we still have considerable room to grow, and acknowledge that our list is certainly not exhaustive, we will discuss three strategies with examples from our teaching practices that have supported the conscientious shift we are trying to make in our early learning environments.

## Digital Literacy Skills and Technology

Technology is present in our everyday lives, and this is reflected in our students' home environments but not always at school. As classroom teachers, we can try to bring technology into our early learning classrooms; doing this will work to bridge the gap between home and school literacies as well as naturally reinforce the development of digital literacy skills. Recording applications (apps), story-creating software and multilingual digital story software are all examples of technologies that are of great value to early childhood education. Marsh et al (2017, 329) shared how such technologies can provide "teachers with opportunities to include and publicly value children's heritage languages, even when they [do] not speak all of the languages themselves."

Digital show and tell, a simplified version of digital "screen-based composing" (Miller and Wells Rowe 2019, 329), is one example of how we include technology in our early learning classrooms. In this activity, children digitally record images or videos from their home environment to share with their classmates; these images and videos are captured with parent or guardian support and e-mailed to the classroom teacher. Students are then encouraged to explain their digital images and videos using their home language(s). Miller and Rowe (2014) found that "talking about home and community photos often prompted children to describe photo features in their heritage languages" (as cited in Miller and Wells Rowe 2019, 329). This simple literacy activity supports students in developing multilingual awareness and appreciation of each other's home cultures. As described by Miller and Wells Rowe (2019, 325), "Digital tools can provide new opportunities for children, families, and communities to be represented and valued in school literacy activities." Technology can also open the door for monolingual teachers like us to access translanguaging as an instructional practice (Hornberger and Link 2012, as cited in Miller and Wells Rowe 2019, 326) and tool for learning.

## Translanguaging

Translanguaging is both an impactful and straightforward means of empowering students who are multilingual learners. Garcia and Kleifgen (2010) explain that "the goal of translanguaging pedagogies is that students use their languages together to make meaning and develop literacy in both languages" (as cited in Miller and Wells Rowe 2019, 326). Language is deeply embedded in culture; if a student's home language is brought into the classroom, it opens a window for their culture to be included as well. Culturally sustaining pedagogies are strengthened through the use of translanguaging practices because "when students' heritage languages are used as tools for learning in the classroom, the value of their bilingualism and cultures is affirmed, creating a space for intercultural exchange" (Cummins 2012, as cited in Miller and Wells Rowe 2019, 327). Educators will require the support of technology to use translanguaging in their classrooms, as some of their students will likely have first languages that the educator themselves may be unfamiliar with.

In our classrooms, we have had encouraging experiences translanguaging using the narration options in the online digital picture books from the Unite for Literacy website (www.uniteforliteracy.com). Using Unite for Literacy, we projected digital read-alouds and chose our students' home languages in the narration options. Page by page, we read the story aloud in English and then used the narration function to read the story in our students' home languages. We found this activity increased the engagement and interest of all our students. Another example of translanguaging from our classrooms began while exploring the *Little Women's Lodge Kit* (Auger 2019a) books. While reading *Mîkiwâhp: The Traditional Tipi* (Auger 2019b), prekindergarten students explored the Cree syllabic alphabet and began to wonder about different languages and their symbolic representations. By inviting students' families to send in YouTube or self-made videos, the classroom explored the symbols of various student home languages. This was a valuable learning experience for the students and teachers alike and further demonstrates how technology can be used to support translanguaging in early learning classrooms. Another area where technology is often of critical importance when developing a culturally sustaining pedagogy is through the implementation of diverse read-alouds.

## Diverse Read-Alouds

Diverse read-alouds provide an opportunity to begin the diversification of classroom materials. When educators select books that represent the wide variety of diversities found within our world, they show their students "whose lives [they] consider important enough to include in their classroom" (Ryan and Hermann-Wilmarth 2019, 313). Culturally diverse read-alouds include books

that represent a variety of cultures as well as dual-language picture books. When students are represented in books that are read aloud by their teacher, they feel welcomed and respected. "Read-alouds can help create feelings of belonging in a community of enquiry … [and they] may be particularly important for children from marginalized groups, such as bilingual and struggling students" (Conrad et al 2004; Hsu-Pai 2010; Wiseman 2011, 2012; as cited in Moffat, Heydon and Iannacci 2017, 5). Using multicultural picture books in your classroom helps children learn about different cultures and develop multicultural awareness. Books can be selected to represent a wide diversity of learners and support "cultural pluralism" (Miller and Wells Rowe 2019, 327).

Dual-language picture books can develop metalinguistic awareness and increase feelings of belonging. Zaidi (2020) found that dual-language picture books "promoted an understanding of multiple dimensions of language, enhanced communicative and intercultural competence, and helped to develop reflective capacity for all learners" (p 285). In our classrooms, it would be difficult to include dual-language picture books without the use of technology as many educators cannot speak the home languages of all their students. The Unite for Literacy website is one example of how we have used technology to include dual-language picture books in our early learning classrooms. Bringing family members and other multilingual guest readers who can speak your student's home languages into your early learning classroom is another way educators can give their students a dual language story experience. In this example, the educator could read a page of the story in English, and the guest reader would follow by reading the page in another language.

Educators looking to develop a culturally sustaining pedagogy should reflect on whether the books chosen for their classroom represent the home cultures and languages of their students. Carefully selected read-alouds can open conversations regarding social justice issues with students; taking the time to have these difficult conversations is key to breaking down power structures and creating a more equitable classroom and community.

# Conclusion

The complexity of our classroom dynamics continues to grow, and, as early childhood educators, we must adopt culturally sustaining pedagogies that embrace the diversity of learners found within our classrooms. As white, middle-class, female teachers, we must work toward deconstructing an early learning educational system that often excludes technology, favours the English language (Miller and Wells Rowe 2019, 325), and over-represents Western culture in classroom libraries. Using a variety of technologies to engage our students in digital literacies is one critical strategy we are using as we shift toward culturally sustaining pedagogies; different programs and applications can be used together with teacher support to facilitate digital literacy skills and bilingual development. We are also embracing a translanguaging theory and consistently welcoming and representing all languages and cultures in our early learning classrooms. Incorporating diverse read-alouds is the third strategy we are using in our pedagogical shift. Engaging children in a variety of diverse books through both traditional and digital read-alouds can highlight a variety of cultures and worldviews.

We are mindful of the fact that the problems we found and strategies we listed are only the beginning of a classroom practice that supports diverse learners. Our journey to engage in a culturally sustaining pedagogical shift is only the tip of a much larger and critically important iceberg. Educators are powerful change-makers, but policy decisions and changes need to be implemented to complement individual teachers' efforts. As our digital world continues to evolve and develop, we cannot predict what the future will hold; however, we can work together to support our students in culturally sustaining classrooms that value all learners for their diversity, and endeavour to create environments that break down societal barriers and challenge social justice issues.

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# Grandparents and Grandchildren in Canadian Picture Books

*Linda Reichenauer*

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## Abstract

This article first reviews 2021 census data about multigenerational and skip-generation (Statistics Canada 2017) Canadian households. Citing research studies, it next considers how using children's literature about family diversity may be beneficial to children. Suggesting *How to Read to a Grandma or Grandpa* (Reagan and Wildish 2020) and the Iowa Reading Research Center (Donohue 2016) as resources, it then discusses ways for grandparents to support their grandchildren's literacy. It also summarizes some of Rothenberg's (1996) suggested strategies for how schools can support grandparents and grandchildren in skip-generation families, giving two examples of picture books that specifically portray this family type. Last, it provides an annotated list of picture books published in Canada depicting a variety of grandparent-child interactions and relationships, and featuring characters from diverse cultural, ethnic and racial backgrounds.

## 2021 Canadian Census

Based on 2021 census data, Statistics Canada (2022) reports that more than half a million children aged 0 to 14 were living with at least one grandparent. Ninety-three per cent of these lived in multigenerational households with at least one parent and one grandparent. Statistics Canada (2022) suggests various reasons for living in multigenerational households, such as sharing finances, care arrangements, family reunification, lack of housing, and cultural or individual preference.

Regarding cultural factors, Statistics Canada (2022) notes earlier studies have found that grandchildren living with grandparents were "more likely to live with an immigrant grandparent, have an Indigenous identity, belong to a racialized group, speak a non-official language in the home or be affiliated with Sikh, Hindu, Buddhist or Muslim religions" (p 15).

About the possibility that the number of multigenerational households will continue to increase, Statistics Canada (2022, 15) states:

> As the Indigenous and ethnocultural composition of the population in Canada continues to evolve alongside aging of the population, multigenerational living arrangements may play a growing role in the care and social support networks of children, parents and seniors in the coming years.

The term *skip-generation* refers to households with only grandparents and grandchildren (Statistics Canada 2017). In 2021, 7 per cent of children living with at least one grandparent lived in households without parents (Statistics Canada 2022).

## The Importance of Children's Literature About Diverse Family Relationships

According to Wu and Schimmele (2011, 235), "the popular image Canadians associate with "family" is a household that includes a married heterosexual couple and their dependent children, the nuclear family, even though this designation does not capture the total diversity characterizing numerous Western families."

Citing research studies, Gilmore and Bell (2006) offer reasons for using children's literature about diverse family structures:

> When children from alternative families witness themselves . . . , their confidence increases as well as their motivation (Hampton, Rak and Mumford, 1997).

> Also, . . . it demonstrates . . . that the children who live within these families are important (Hampton, Rak and Mumford, 1997). By using [it], teachers can unlock children's concerns and help them realize that there are others in the same situation. Furthermore, . . . children learn that not everyone has the same values and beliefs as their own (Charles 2000). Finally, [it] offers a way to safely and sensibly discuss serious issues regarding families (Leland and Harste 1999, 281).

*The Great Big Book of Families* (Hoffman and Asquith 2010) is one picture book that explores all kinds of families, including how they can differ in membership, homes, feelings and other ways, and ends by asking the reader to discuss their own family.

*All Kinds of Families* (Ganeri 2020) is another picture book that celebrates family diversity. It also offers advice for teachers, parents and caregivers on helping children cope with family life changes and providing adoption support as well as including a list of recommended websites.

Noting that families come in various forms, Peterson and Swartz (2008) consider that picture books "can hold up a mirror" to children's own family relationships (p 89). According to Peterson and Swartz, family stories can inspire students to write about their own family members and gatherings, and provide them with insights about families struggling with hardships like homelessness and poverty.

*Sometimes It's Grandmas and Grandpas, Not Mommies and Daddies* (Byrne and Haverfield 2009) and *On the Other Side of the Garden* (Buitrago, Yocktang and Amado 2018), cited later in this article, are two examples of stories about families struggling with hardship. These families are facing the challenges of parent-child separation and the child's adjustment to grandparental care.

## How Grandparents Can Support Their Grandchildren's Literacy

In *How to Read to a Grandma or Grandpa*, Reagan and Wildish (2020) offer advice for shared reading that both grandparents and grandchildren may find humorous and practical. Tips to grandchildren include helping their grandparents to find and choose books, read in different voices, turn pages, discuss favourite parts, and extend a book through play and other activities.

The Iowa Reading Research Center suggests seven ways in which grandparents can support their grandchildren's literacy. These involve telling stories about their own childhoods using pictures, toys and other objects; regularly reading together; using local library resources; helping them build their own home-reading collections; becoming their pen pal to encourage writing; offering reading incentives; and having reading materials available in their own homes for visits (Donohue 2016).

## How Schools Can Support Skip-Generation Families

According to Rothenberg (1996), grandparent-grandchild families represent an increasing percentage of school students, whose numbers will continue to grow. Rothenberg offers a list of strategies for schools to help grandparents acting as surrogate parents and a second list to support grandchildren being raised by their grandparents.

Strategies for schools to help grandparents include becoming familiar with school enrolment policies on grandparents' informal and legal rights; suggesting resources, such as national organizations and local social service agencies; and strengthening the grandparent-school relationship, for example, by scheduling extra time for grandparent-teacher conferences, highlighting communication and encouraging them to volunteer at school (Rothenberg 1996).

Rothenberg's (1996) strategies for schools to support grandchildren include anticipating and minimizing possible problems, such as providing adjustment time for regular school attendance and completion of school work; finding and encouraging their strengths; and helping them to feel included with their peers. Schools that "recognize and support these nontraditional families will be able to provide better service to their communities" (p 5).

## Picture Books About Skip-Generation Families

*Sometimes It's Grandmas and Grandpas, Not Mommies and Daddies* (Byrne and Haverfield 2009) explores the feelings of a child being raised by grandparents. In an author's note, Byrne explains personal reasons for writing the story and provides a list of online resources for grand-families.

*On the Other Side of the Garden* (Buitrago, Yocktang and Amado 2018) also describes the feelings experienced by a child who has been left in a grandparent's care.

## Canadian Picture Books About Grandparent-Grandchild Relationships

As stated in the introduction, the following is an annotated list of picture books published in Canada with characters from diverse cultural, ethnic and racial backgrounds. The stories depict a variety of

grandparent-child interactions and relationships. Some portray situations involving feelings like anger, uncertainty or grief, while others celebrate imaginary or real-life happy occasions.

Cited earlier, one of the Iowa Reading Research Center's suggestions (Donohue 2016) for ways that grandparents can support their grandchildren's literacy is to utilize local library resources.

The following books are available in public library collections.

## Grandfather Stories

- *An Alien in My House*, by S G Nanji. Illus C McLeod. Second Story, 2003.
  Ben and grandpa learn that they are much more alike than they first imagined.
- *Always With You*, by E Walters. Illus C Liu. Nimbus, 2019.
  Grandfather leaves letters and gifts for the most important times in Emily's life.
- *At Grandpa's Sugar Bush*, by M Carney. Illus J Wilson. Kids Can Press, 1997.
  In spring, a grandfather and grandson harvest sap to make into maple syrup.
- *The Bagel King*, by A Larsen. Illus S Nichols. Kids Can Press, 2018.
  Eli has an unusual surprise for Zaida, who is recuperating, and friends.
- *Fog Cat*, by M Helmer. Illus P Mombourquette. Kids Can Press, 1998.
  Hannah and grandpa, who live in a seaside fishing village, take in a stray cat that one day appears out of the fog.
- *From Poppa*, by A Carter. Illus K Charko. Lobster, 1999.
  Sharing a wonderful experience cheers Marie up after learning that Poppa must move to a warmer place in winter.
- *Grandpa's Clock*, by R Gilmore. Illus A Meissner. Orca, 2006.
  Cayley's clock-maker grandfather teaches the importance of calmness and patience.
- *Grandpa's Girls*, by N I Campbell. Illus K LaFave. Groundwood Books, 2011.
  The narrator describes adventures at much-loved grandpa's ranch.
- *In the Red Canoe*, by L A Davidson. Illus L Bifano. Orca, 2016.
  A young girl learns about nature's wonders while canoeing with grandpa.
- *The King of Keji*, by J L Coates. Illus P McKinnon. Nimbus, 2015.
  While camping with gramps in Nova Scotia's Kejimkujik National Park, Jacob discovers all the treasures needed to become a king.
- *Lighthouse: A Story of Remembrance*, by R Munsch. Illus J Wilson. North Winds, 2003.
  Grandpa used to take Sarah's father, as a boy, out to the lighthouse. On the night of grandpa's funeral, Sarah carries on this family tradition.
- *The Magician's Secret*, by Z Hyman. Illus J Bluhm. Tundra Books, 2018.
  Grandpa, a retired magician, teaches Charlie about the magic of imagination.
- *Morning on the Lake*, by J Bourdeau Waboose. Illus K Reczuch. Kids Can Press, 1997.
  An Indigenous grandfather and grandson spend a special day together on the lake.
- *Music from the Sky*, by D Gillard. Illus S Taylor. Groundwood Books, 2001.
  As a loving gift, grampa carves a wonderful wooden flute.
- *My Day with Gong Gong*, by S Yee. Illus E Chen. Annick, 2020.
  Spending a day in Chinatown turns out to be more eventful than May first imagined.
- *The Not-So-Faraway Adventure*, by A Larsen. Illus I Luxbacher. Kids Can Press, 2016.
  Theo wants to be an explorer like Poppa. For Poppa's birthday, Theo plans a memorable adventure.
- *A Plan for Pops*, by H Smith. Illus B Kerrigan. Orca, 2019.
  Lou and grandad make a plan to cheer Pops up after an accident.
- *Proud as a Peacock, Brave as a Lion*, by J Barclay. Illus R Benoit. Tundra Books, 2009.
  A young boy's veteran grandfather teaches the importance of remembrance.
- *Really and Truly*, by É Rivard. Illus A-C Delisle. Trans S Quinn. Owlkids Books, 2011.
  After grandpa's memory fails, it is Charlie's turn to tell grandpa funny tall tales.
- *The Sour Cherry Tree*, by N Hrab. Illus N Kuzemi. Owlkids Books, 2021.
  Walking through Baba Bozorg's house, a granddaughter remembers happy times they shared.
- *A Stopwatch from Grampa*, by L Garbutt. Illus C Mok. Kids Can Press, 2020.
  The ticking of grampa's stopwatch brings back memories of times spent together.
- *Waiting for the Whales*, by S McFarlane. Illus R Lightburn. Orca, 1991, 2016.
  A grandfather and granddaughter feel a close

connection to the orcas, whose return they await each year.

- *You Can't Rush a Cat*, by K Bradford. Illus E Watts. Orca, 2003.
  Jessica helps granddaddy become friends with a homeless little cat.

## Grandmother Stories

- *Abuelita and Me*, by L Carranza. Illus R Mayani. Annick, 2022.
  Abuelita, who is sometimes stigmatized, stands up to a bully.
- *Almost a Full Moon*, by H Workman. Illus J Eckwall. Tundra Books, 2016.
  In a cabin in the wintry woods, a grandmother and grandson make soup to warm their guests.
- *Bitter and Sweet*, by S V Feder. Illus K Brooker. Groundwood Books, 2018.
  Grandma's wise advice helps Hannah adjust to a new home.
- *Bottled Sunshine*, by A Spalding. Illus R Ohi. Fitzhenry & Whiteside, 2005.
  On their last holiday together, grandma teaches Sammy how to make blackberry jam. This "bottled sunshine" brings back happy memories.
- *A Bumblebee Sweater*, by B Waterton. Illus K LaFave. Fitzhenry & Whiteside, 2008.
  Nellie wants to wear the amazing sweater knitted by Grandma Needlethorpe all the time—with unfortunate results!
- *Eat, Leo! Eat!*, by C Adderson. Illus Josée Bisaillon. Kids Can Press, 2015.
  To encourage Leo to eat, nonna tries storytelling.
- *Emma's Story*, by D Hodge. Illus S N Zhang. Tundra Books, 2003.
  When Emma, who is adopted, becomes upset about looking different from other family members, grandma provides comfort and reassurance.
- *French Toast*, by K Winters. Illus F Thisdale. Pyjama Press, 2016.
  Phoebe, who is biracial, tries to explain the nickname "French Toast" to Jamaican nanma, who is blind.
- *Grandmother's Visit*, by B Quan. Illus C Mok. Groundwood Books, 2018.
  A young girl's grandmother teaches many things, like about growing up in China, and then leaves one last lesson.
- *Island in the Salish Sea*, by S McFarlane. Illus L Redhead. Orca, 2018.
  The narrator describes spending an island summer with gran.
- *Lessons from Mother Earth*, by E McLeod. Illus C Wood. Groundwood Books, 2002.
  From grandma, Tess learns about caring for nature's bountiful gifts.
- *Maud and Grand-Maud*, by S O'Leary. Illus K Pak. Tundra Books, 2020.
  Grand-Maud always has a surprise gift whenever Maud visits. Maud likes mementos from Grand-Maud's own childhood the best.
- *Mormor Moves In*, by S Nielsen-Fernlund. Illus L-A Laliberté. Orca, 2004.
  Astrid's Swedish grandmother, Mormor, comes to stay. The two don't get along until Mormor helps Astrid get over losing a special friend.
- *My Granny Loves Hockey*, by L Weber. Illus E Liska. Simply Read Books, 2014.
  A granddaughter helps grant granny's lifelong wish to play hockey.
- *My Two Grandmothers*, by D C Léger. Illus J-L Trudel. Nimbus, 2016.
  Although mémère and nannie seem to be completely different, they are the same in one important way.
- *Nana's Cold Days*, by A Badoe. Illus B Junaid. Groundwood Books, 2002, 2009.
  Ken and Rama must think of ways to help nana, who is visiting from Africa, adjust to the cold.
- *Nanny's Kitchen Party*, by R North. Illus L Keating. Breakwater Books, 2019.
  Nanny's Newfoundland kitchen party has guitar-playing moose, tap-dancing dogs and a host of other rollicking critters.
- *Oma's Quilt*, by P Bourgeois. Illus S Jorisch. Kids Can Press, 2001.
  Emily helps to make a cheerful memory quilt, so Oma won't be sad about moving into a retirement home.
- *Sea Glass Summer*, by H J Stoddart. Illus H J Stoddart. Nimbus, 2016.
  After moving away, Molly misses gram's seaside cottage, but a wishing rock helps bring about a happy reunion.
- *Suki's Kimono*, by C Uegaki. Illus S Jorisch. Kids Can Press, 2003.
  On the first day of school, Suki is determined to wear a beautiful kimono, a gift from Obachan.
- *When I Found Grandma*, by S Balasubramaniam. Illus Q Leng. Groundwood Books, 2019.
  Maya's and grandma's relationship gets off to a shaky start, but they soon learn to accept each other's differences.
- *Which Way Should I Go?*, by S Olsen with R Martin. Illus K Charko. Sono Nis, 2007.

Grandma's special song plays an important part in Joey's healing.

- *While We Wait*, by J A Sadler. Illus É Duhameau. Owlkids Books, 2022.
  A grandmother and grandson "sit and knit and wait" for a very significant event.

## Grandparents' Stories

- *All on a Sleepy Night*, by S Crum. Illus S Daigneault. Stoddart Kids, 2001.
  On a visit with grandparents, a young boy falls asleep to night sounds all around.
- *Anna's Pet*, by M Atwood and J Barkhouse. Illus Ann Blade. James Lorimer, 1980, 2011.
  Anna receives some practical grandparental advice about choosing the perfect pet.
- *The Biggest Puddle in the World*, by M Lee. Illus Nathalie Dion. Groundwood Books, 2019.
  On a visit with their grandparents, Sarah and Charlie go on an adventure to find the world's largest puddle.
- *Grand*, by M Stewart Konrad. Tundra Books, 2010.
  Photos celebrate the unique grandparent-grandchild relationship everywhere.
- *Grandparents*, by C Heras. Illus R Osuna. Trans E Amado. Greystone Kids, 2020.
  Manuel affectionately persuades Manuela to go to the village dance.
- *I Don't Want to Go!*, by A Meyer Sanders. Illus A Rowland. Lobster, 2008.
  Visiting grandparents alone for the first time makes Joey feel anxious, but this new experience turns out to be fun.
- *Our Corner Grocery Store*, by J Schwartz. Illus L Beingessner. Tundra, 2009.
  Anna Maria spends favourite Saturdays helping at nonno and nonna's grocery store.
- *Out into the Big Wide Lake*, by P Harbridge. Illus J Bisaillon. Tundra, 2021.
  After grandpa becomes too ill to deliver groceries, Kate, who has down syndrome, takes on the challenge of delivering them alone by boat.
- *Pig in the Middle*, by S Fitz-Gibbon. Illus A Wakelin. Fitzhenry & Whiteside, 2004.
  Emily helps forgetful grandma rescue grandpa from the garden maze where grandpa has been trapped by a rascally dancing pig.
- *Silas' Seven Grandparents*, by A Horrocks. Illus H Flook. Orca, 2010.
  Planning birthday celebrations, Silas thinks of a way to include all seven grandparents and step-grandparents.
- *Wild Eggs: A Tale of Arctic Egg Collecting*, by S Napayok-Short. Illus J Wright. Inhabit Media, 2015.
  Grandparents in Nunavut teach Akuluk all about collecting wild eggs.

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# Considering the Spirit and Ethical Imperative in Establishing Classroom Contexts

*Janine Chesworth and Patricia Steinhauer*

*Janine Chesworth is a settler Canadian, born on the west coast of Turtle Island and raised among the cedar, oak and arbutus trees on the lands of the lək̓ʷəŋən, Songhees, Esquimalt, W̱SÁNEĆ and the xʷməθkwəy̓əm (Musqueam), Skwxwú7mesh (Squamish), and Səlílwətaɬ (Tsleil-Waututh) peoples. Having moved to Edmonton in 2001, Janine considers herself privileged to now live, work and learn on the Treaty 6 lands of* amiskwaciy-wâskâhikan *and* kinokamâsihk *in northern Alberta where she has been a practising speech-language pathologist for the past 20 years with extensive experience in Indigenous early childhood classrooms. Currently, she is also a doctoral candidate in Educational Psychology (Special Education) at the University of Alberta.*

*Patricia Steinhauer, PhD, is an associate professor in the Aboriginal Teacher Education Program and the Department of Educational Policy Studies, (Indigenous Peoples Education), Faculty of Education, University of Alberta.*

In 2019, a new competency was added to Alberta Education's *Teaching Quality Standard*, which guides the professional practice of educators in the province. Competency 5 requires educators to "apply foundational knowledge about First Nations, Métis and Inuit" (Alberta Education 2020, 5) in their teaching. Disappointingly, the competency emphasizes "knowledge about" Indigenous Peoples rather than Indigenous Peoples' knowledge systems. How might Indigenous ways of knowing, teaching and learning be incorporated into and interwoven with Western ways of knowing, teaching and learning (an approach in keeping with the relationship Indigenous Peoples originally expected to have with the settlers they welcomed)? How might educators and special education consultants integrate Indigenous thought systems and ethical constructs into their practices and pedagogies to create more balanced and thoughtful early learning classroom spaces for all children?

As educators, colleagues and coauthors, these are critical questions that we must consider in our own practices. Patricia Steinhauer is a *nehiyaw iskwew* and member of *onihcikiskwapowin*, Saddle Lake Cree Nation No 125, part of the *amiskwacīwiyiniwak* ("Beaver Hills Cree") division of the Plains Cree, formerly a classroom teacher and school administrator in her home community, and currently an associate professor in the University of Alberta's Educational Policy Studies Department. Janine Chesworth is a settler Canadian raised on the west coast of Turtle Island, a speech-language pathologist who has worked extensively in Indigenous early childhood classrooms, and currently a doctoral candidate in Educational Psychology (Special Education) at the University of Alberta.

## Reflecting on Practice

Speech language pathology, like other health care fields, has its foundations in science, a field that operates with the assumption that best practices can be determined using objective scientific methods and quantitative research. As the Indigenous scholar Tuhiwai-Smith (1999) notes, this is a risky assumption:

> [T]he belief in the ideal that benefiting mankind is indeed a primary outcome of scientific research is as much a reflection of ideology as it is of academic training. It becomes so taken for granted that many researchers simply assume that they as individuals embody this ideal and are natural representatives of it when they work with other communities. (p 3)

The Government of Alberta's Children's Services also recognizes that what research may have identified *best practice* in mainstream early education may not prove to be a best practice in Indigenous settings. In its resource, *kâ-nâkatohkêhk miyo-ohpikinawâwasowin: Incorporating an Indigenous Worldview into Prevention and Early Intervention Programming and Evaluation* (2019), it states that the decision to develop the resource

> was made based on the understanding that western-held concepts of prevention and early intervention strategies are often not an effective or appropriate approach when working with Indigenous families and communities. Similarly, western-based evaluation is not often effective when working with Indigenous communities. (p 8)

In her own work as a speech-language pathologist (SLP) and special educator, Janine has also wondered whether mainstream early education practices (which she and her colleagues draw on) fit within Indigenous contexts. To better understand the intersection of these worlds and her responsibilities within them, she returned to classroom spaces as a learner rather than an educator, joining the Indigenous Research Methods (IRM) class taught by Patricia. As Janine relates:

> On a cold, dark January evening in 2019, driving to my Indigenous Research Methods (IRM) class, the first of the semester, my stomach was a knot. I arrived, parked my car and entered the elevator of the Education-south building. Butterflies did not so much flutter as dive-bomb and peck at my intestines as I watched the elevator's numbers light up one by one. Stopping on the seventh floor, I took a deep breath, exhaled and exited. My footfalls, echoing in the empty corridor, were tentative, reflecting my uncertainty about which way to go. Just then, a head popped out at one end of the hall, "Are you here for IRM? We are here—tawâw—welcome, come in."

As a middle-class white female settler Canadian attending a class on Indigenous research methodology, Janine was anxious, and, without realizing it, she slipped into "us versus them" thinking. She wondered whether she was an unwelcome trespasser, occupying a spot that rightfully belonged to an Indigenous scholar. She worried that she would seem ignorant, stand out or offend.

This was not what happened. Instead, "I was welcomed as a learner, just as I was." The class was held in a kitchen with a large oval table, a welcoming space, and the instructor beckoned her in. Like the other students she would study with, she brought to the classroom her own distinct background, experiences and life-worlds:

> Every Thursday night, my IRM class gathered around the table in the Aboriginal Teacher Education Program's kitchen, a Crock-Pot of soup slowly simmering. The comforting aroma intermingling with the scent of burned sage (the residue of our pledge to good intent) settled us into learning with content bellies, open minds and good hearts.

Slowly, in the weekly class meetings, Janine was able to work through her tension about her position as a non-Indigenous person in that space, a process supported by the carefully nurtured learning dynamic cultivated for the students. Sharing food before the start of class fostered a sense of relational equality among the students, treating themselves and each other with respect and as equals, and they developed a sense of community. Each class began with a smudging ceremony, guiding everyone to speak kindly and to listen well. This was followed by a sharing circle, in which students could choose, without repercussions, to share or not to share. Anything that one wanted or felt the need to share—ideas brought up in class, how their day went, an emotional struggle or any other topic—was welcomed and listened to nonjudgmentally.

Sioui (1992) writes that "[e]verything done by the power of the universe is made in the form of a circle" (p 8). By gathering in a circle to eat, smudge, listen and share, we engage in a way of learning or "being and becoming" (Alberta Children's Services 2019, 13). Janine came to know and trust the safety of the circle's embrace, its contours softening her ever-present sense of tension and enabling her to sit with the group, examining her self and her motivations. In listening to the stories, ideas and opinions of others, Janine found courage to interact honestly with other students. As Makokis and Bodor (2014) observe, "[k]nowledge does not and cannot exist without a relationship between at least two beings" and, in this and other ways, the circle enabled and supported participants to learn with, from and alongside each other.

## Indigenous Ways of Teaching and Learning

As Janine's experience demonstrates, the circle offers a deeply respectful and altogether different Indigenous approach to teaching. In *nehiyaw* pedagogy, the terms *kiskinaumagehin* (teaching another), *kiskinaumatowin* (teaching each other) and *kiskinaumasowin* (teaching oneself) reflect the relational way of learning and teaching manifested in the process of the circle (Goulet and Goulet 2014). Circle participants have complete autonomy in their learning and can do so with acceptance (rather than judgment) about where they are at as a learner. The process of the circle has informed Patricia's practice as an educator, first as a teacher and administrator in the K–12 system and now as university professor whose work focuses on Indigenous pedagogy. She understands the role of a teacher as to meet the learner where they are at, to gently guide or support their learning as

determined by the learner, and to learn alongside them. In this teaching style, the teacher does not place themselves above the students or in a position of being *the* expert, demonstrating respect for the position and place of the learner.

This pedagogical approach reflects the Indigenous ethics of autonomy and noninterference, which promote independence and the ability to think for oneself (Brant 1982, as cited in Ross 1992). In *nehiyaw* (Cree) philosophy, the act of teaching is seen as an interactional process; both teachers and learners are teaching and learning in a relational and dynamic experiential process (Goulet and Goulet 2014). These ethics of autonomy and noninterference also extend to teaching with children. From a *nehiyaw* perspective, a child ultimately holds the autonomy and choice to learn. In *iyiniw* child education, children are free to determine their own learning paths and are offered a range of activities in which they can participate or not, without compulsion (Haviland and Pillsbury 2012; Makokis et al 2020). Hanohano (1999, 208) notes that "[t]here is a wide-spread Aboriginal understanding that pedagogically speaking, thought or information must be shared in ways that leave it open to the listeners to take whatever meaning they wish to find in what they have heard." Absolon and Willett (2005) observe that Indigenous pedagogy "rel[ies] on the intelligence and imagination of [individuals] to draw their own interpretations and conclusions." Designing classroom contexts that are led by teachers/guides who understand and can incorporate the distinct pedagogical practices of the communities they serve, and where Indigenous ethical principles are present and respected supports Indigenous students' learning. This is not a quick fix. It is not simply a matter of infusing Indigenous ideas into a Western context. Change requires relational work and takes time to develop, create understanding and then implement.

## The Ethic of Noninterference

The ethic of noninterference is an important guiding principle in Indigenous thought and reality. As Brant (1990) makes clear, this ethic operates within a context of natural law and additional Indigenous ethics, principles and practices. In addition to the ethic of noninterference, these include the practice of noncompetitiveness, the exercise of emotional restraint, the practice of sharing, the Indigenous concept of time, Indigenous protocol and the practice of teaching by modelling. Brant describes the ethic of noninterference as "one of the most widely accepted principles of behaviour among [Indigenous] people" (p 535). It calls on people not to interfere in other peoples' activities or affairs or "to exert pressure by advising, instructing, coercing or persuading," actions that are "seen as an attempt to establish dominance." Brant notes:

> The ethic of non-interference … extends to adult relationships with children … [An Indigenous] child may be allowed at the age of six, for example, to make the decision on whether or not he goes to school … The child may be allowed to decide whether or not he will do his homework, have his assignments done on time… [Indigenous] parents will be reluctant to force the child into doing anything he does not choose to do. (p 535)

Patricia recognizes the presence and impacts of the ethic of noninterference on her own experiences as a child:

> When I look at my parents' rearing, this ethic was very much alive in our home and reinforced in the community. I recognize the ethics and responsibilities granted me as a thinker, which made me a life practitioner of choices. Choices and decision making have been my reality for as early as I can recall. The ethical principles were familiar to me as a child and extended beyond our home. I was treated this way by many—if not all—others in my reserve community. My feelings and emotional wellness were important, but I now recognize that it was autonomy my parents and community were nurturing. This was very important to them. As I grew older and became a schoolteacher it became clearer. Seeking the advice of my parents to inform my pedagogy, I would sit with them for hours considering important life decisions, explaining all the things I worried about or that I was excited about. I always hoped my dad, who held much more life wisdom than I, could give me an affirmation or the finite answer I sought. Instead, he'd say (and I still hear him say), "It's up to you, my girl." He followed the ethic of noninterference. I try my best to think back to what other guidance or insights he might have given, but no matter what, it was always, "It's up to you, my girl."

## The Ethic of Noninterference in the Classroom

Incorporating the ethic of noninterference in an early years classroom must include foundational elements that attend to and focus on designing the learning context. Because every community of learners is unique to its place and local living knowledge, there is no step-by-step guide to what this process might entail. There are, however, elements that should be considered in the process. These include natural law, personal autonomy and acts of judgment.

Natural law can be centred in governance of the learning context. Each school community has its own distinct spiritual intelligence and understanding of natural law, and this should be reflected in the governance model. For example, *nuhelot'įne thaiyots'į nistameyimâkanak* Blue Quills University, located in Northern Alberta and governed by representatives of seven surrounding First Nations, takes guidance from the

natural laws of love, sharing, caring and honesty, laws that can be incorporated into the governance of the classroom environment.

Each child is personally autonomous, a quality that should be recognized, nurtured and protected in a classroom setting. *awasis*, the *nehiyaw* (Cree) word for child, is morphologically linked to the words for the stars and the sun and translates as "the little being that shines" (Goulet and Goulet 2014, 60). As *awasis* makes clear, children shine with "the light, sparkle, and vibrancy of life" and are viewed with sacred reverence (Goulet and Goulet, 6). Patricia's Aunt, Leona Makokis, teaches that children are more spirit than human. As they grow, progressing from infancy to adolescence, it is critical to recognize, show respect for and protect their distinct individual spirits and their collective spirit. Grading, comparing or labelling children in ways that put them in deficit positions damages their spirits. Too often, labels are used as an excuse not to meet a child's needs, to confine them in a categorical box or to underestimate their potential. It is precisely here, in this space of individual need and autonomous choice, that the opportunity to broaden our teaching emerges. A pedagogical approach that emphasizes a value-based seeing of a child before teaching happens is of paramount importance. To do this, a teacher readies themselves, draws on their own good energy and emotional wellness, and recognizes that a raised voice or impatient or stern behaviour can damage or negatively impact the spirit.

Judgment is a site where ideologies collide. The act of judgment is counter to the ethic of noninterference, which requires us to respect all beings and things, and honours natural law and autonomy of all beings. As Ross (1992) relates, describing a conversation between two young Indigenous teens who, when discussing a movie they had watched together, withheld any negative opinions or judgment of the movie they may have had, this respect should be extended to things that may seem relatively trivial. Judgment is not part of the processes. Patricia recalls that many knowledge holders, such as *nimosompun* Morris Quinn, who often, in conversation, stated *kakêikin*, a term that fundamentally honours one's truth, even when that truth seems to be only remotely possible, because it is true for the person who believes it to be so. *nehiyaw* philosophy holds that one person should never negate another person's view, even if they fail to see that view themselves. This has implications for teachers' evaluation practice and praxis. In a learning context, creating spaces and opportunities for developing autonomy are the foundation of all subsequent learning. If we understand *awasis* as light and as an already perfect and competent being, it becomes possible to nurture personal autonomy. One classroom practice that can nurture autonomy is to give children opportunities to make decisions, and then honour the decisions they make, even when those decisions may not be the decisions a teacher expected or wanted.

The ethic of noninterference affirms the personal autonomy of each human, and personal autonomy supports children in the development of their identity and their connection to within. When natural laws guide foundational praxis, noninterference and personal autonomy can become ingrained in classroom practice.

*pastahon* translates to the breaking of a Cree law against human beings. To intentionally interfere with or intentionally harm another human is *pastahon* and disrupts harmony (McAdam 2019). *ohcinahwin* is the breaking of Creator's law against anything not human, including the environment, animal laws and all Creator's creations.

Protocols can help an educator learn about the natural laws of the children they work with and the people on whose lands they are working. Protocols are sometimes presented as a gift. As Urion (1999) explains, protocol reflects many aspects of traditional knowledge, and, in that sense, can be a learning tool. Protocols are sometimes presented as a gift, and each time one is performed, it is a new experience. Before performing a protocol, we need to learn the appropriate physical form and process of the protocol; when or how often it is appropriate to perform it; the potential consequences of getting it wrong or not performing it; who else should be involved in the protocol; and the importance of location, time and season, or physical setting for the protocol (p 17).

## A Starting Place for Reshaping Classrooms

Learning from Indigenous pedagogies such as these and reflecting on her own practices as a speech-language pathologist working in early learning classrooms has left Janine with many questions. While we often consider *what* we teach, for example, content such as theme choices, literature or language targets, we often overlook *how* we teach. How might an ethic of noninterference be played out in contemporary classrooms today? It requires more than simply allowing children to choose their learning station within an engineered environment. This ethic does not act alone. There are other ethical responsibilities to consider when designing your classroom. While noninterference includes the responsibility to withhold judgment, which is difficult to fulfill within existing frameworks that rely on academic or developmental achievement and growth as measurement, introducing this ethic and supporting children's personal autonomy provide a starting point for the recognition of and respect for children as complete and whole beings. Patricia relates that

> as a young *nehiyaw* child, I always felt embraced, nurturance, belonging, and never excluded by any

adults. Looking back, I realize that each adult in my life was connected to me either as a parent, aunt, uncle, or grandparent, including those who were not blood relatives. They all took responsibility for nurturing and guiding me.

In classroom and school communities, it is important to collectively honour *ohpikināwāsowin*, raising a child. Whether or not educators see themselves as family members, that is the role they have taken, and they cannot know how to fulfill that role without guidance from the families or communities in which they are embedded.

How might this be achieved in early learning centres? Adopting an invitational learning approach may be a viable solution in the preschool setting, but if funding is linked to children's achievement of specific goals, what happens when a child chooses not to engage in a given goal-oriented activity? As educators, do we feel free to honour and respect their choices, or do we feel obliged to convince or coerce their participation?

Current early learning environments are prescriptive by nature. As an SLP focused on preschool-aged children, Janine saw that children were more than just encouraged to sit at circle time, or line up for handwashing or gym. How do we get early learners to follow a structured agenda at such young ages? Positive reinforcement and hands-on physical assistance are heavily relied upon tools for encouraging the behaviour we seek in a busy classroom. Often learning goals are created for children and activities introduced to target those goals, with participation seen as nonoptional and integral to their developmental success. In contrast, the Jalaris Kids Club in Australia describes their learning environment as one in which "all skill levels are considered equal and kids are offered a range of activities from which they can choose freely to participate or not" (Haviland and Pillsbury 2012, 29). The authors further describe the club as "a space where those attending are free to be themselves without judgement. . . interventions are only introduced if there is a clear health issue, or if help is specifically sought from a child or a family member" (p 30). Indigenous early learning theory is similarly mindful of promoting healthy identities in children and respecting children's interests and developmental abilities. Best practices or sharing other approaches can work but what is most important is that teachers honour the ethics and natural laws of the communities they serve, and root and ground practice in this foundation.

What is inviting to one student may be disinviting to another. As educators determined to be both intentional and informed about creating inviting environments for their students, it is essential to understand students both within and outside the classroom. Including children's family members in class activities and engaging in protocol or finding community members who are willing to help you to determine appropriate protocols can all be helpful strategies to obtain knowledge about the children. At the same time, as Patricia has written elsewhere:

> [My] most important responsibilities are to be caring, responsible and accountable in my relationships with my students, to nurture *esohkahk nehiyaw mamitoneyihcikan* amongst them, and to centre my practice in *wahkohtowin*, our sense of interconnection with and kinship to all living things, including our ancients and descendants (Steinhauer 2022, 13).

When, as an educator, you attend to your own needs first, then consider the diversity of the children you serve, and the relational roots both you and they exist from, you create a platform of respect. By accepting them and refraining from judging their everyday needs and individual selves, you can generate a good energy space, and a space for children's individual excellence. Within this place, every child will want to be themselves.

*ay hiy*, thank you for all that you do.

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# Daily Outdoor Exploration in a Kindergarten Class: Abi Henneberry

*Alison Katzko*

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Abi Henneberry teaches full-day kindergarten at Lois E Hole Elementary School, in St Albert, and has also taught K–6 nature education. She loves working with young children and inspiring awareness of the values GEOEC espouses.

## Getting Students Outside Every Day

Abi takes her young students outside for a walk of at least one kilometre every morning. "Our longest walk this year has been more than 4.7 kilometres. By the end of the year, conservatively, we will have walked the distance from St Albert to Calgary," she told me.

They go outside every day, even in the winter. Abi emphasized that students can still get outside for exercise and fresh air during Alberta's frigid winters. Proper clothing, communication with parents, and education for staff and students about safety in low temperatures are all key factors for building students' awareness and resilience in our climate. Even with temperatures between –20°C and –30°C, she still tries to get some quick time outdoors. For example, one day, instead of taking a walk in the community, Abi and her students stayed in the schoolyard: "We did yoga poses that day in the snow, took pictures, then raced around to keep our circulation going and returned indoors before anyone got too chilled." Abi believes that children need to be climate aware and prepared for extreme weather, no matter where they live—but especially here in the north.

As for the impact of the COVID-19 global pandemic, Abi has found that getting outside "is the best way for children to release energy safely and take a break from wearing their masks."

## Planning for the Walks and Building Curriculum into Outdoor Time

Abi explained that she bases her walking routes on "what we're learning and how we're feeling each day." She said,

> My students are full-day attendees, so I like to bring them inside to get sorted before heading out for an adventure. We come in, get their things put away, make washroom trips and clothing adjustments, take attendance, and discuss our route and plan for the morning. We also do a feelings check-in to address our general energy level and attitude as a group. We address questions and concerns, and then proceed to the route.

This routine helps, as her students start the day by being outside for at least an hour. They often spend even more time outside: "I do increase that time because we

are doing work while outside. We are working on numbers. We are identifying letters. We are doing science. We're working on cooperating and following rules. We work through games that enhance fitness." Abi's students are engaging in a lot of curriculum during that time outside!

As for how she plans for this curriculum content, she said,

> I plan differently for different purposes. I start with getting kids outside and finding what is challenging and interesting—knowing that we can connect anything to a curricular outcome. I take kids outside and utilize conscientious reverse design. I know *that* was math, and *that* was language arts, and *that's* a science lesson. I know I'm not going to be able to meet every single element of the curriculum at once, whether inside or out. It's a combination of both, with a heavy focus on learning in the outdoor environment, through which I believe we achieve a rich and valid curricular balance.

## Bringing Meaning to Students' Learning and Connecting Learning to the Real World

Abi noted that because of this time outdoors, "the curriculum has more depth and meaning, because they can take it beyond the activities and work in the classroom." As a kindergarten teacher, she has a great deal of passion for bringing meaning to what she is teaching. "It doesn't do me any good to teach the alphabet, numbers or reading without meaningful context in the real, tangible world," she told me.

Abi has a wealth of ideas for connecting her young students to meaningful learning. She sees taking students outside as a way to create meaningful experiences to build connections: "That's why going outside to learn in a variety of environments is so important. It identifies purpose, fosters understanding and informs practice in our world."

Abi shared how going outside can become a learning experience:

> An example of environmental math connection is identifying the numbers on a variety of houses. A lot of students live near the school, so knowing the numbers on the houses has a real-world, practical application, as well as reinforces number recognition. It is inspiring to watch children make new connections between curricular elements and real-world experiences. These "aha!" moments are valuable for fostering interest in lifelong learning from a young age. Meaning often comes from such connections, and witnessing the process unfold excites me as an educator.

She can see in students, as well as in adults, how excitement builds and grows "when people gain a new perspective, or change their perspective. Then they themselves are excited about what they've observed in and learned about their world."

Engaging in hands-on experiences is key. "I think learning is most meaningful when you take it into their immediate world," Abi said. "When children walk by things they can see and touch at eye level, they experience them more personally and fully." She noted that "children are usually driven to destinations and pass unknowingly by interesting features near their homes." As an example, she mentioned a neighbourhood ravine: "Now that they get to walk back and explore the actual wooded space, I'm getting stories from parents about going for family walks, when the kids show and inform them about what we've seen in class." Abi recognizes this as "an expanding knowledge of community for the families living there."

Again, meaningful learning and real-world connections can be connected to the curriculum:

> Getting out in the community and making it real at the children's level challenges us to observe and problem solve, which is part of our curriculum. For example, we've run into situations on our first excursions like the one in the children's song "Going on a Bear Hunt": "We can't go over it, we can't go through it, we'll have to go under it." This has led the children to think about the matter at hand and progress accordingly, using their skills to keep the adventure on track. It's being aware of the curriculum and how it connects to what we're doing outside. We often look for letters in the environment and discuss how "the tree is formed in an upside-down A" or "that peak of the roof has an A or looks like an upside-down V."

Again, it's about getting them to look at things and try to see things that they might otherwise overlook. It is also giving them the opportunity to practise and explore. This is building a lifestyle where their learning is part of their everyday lives.

## Learning to Adapt and Work Together

Abi said, "When kids go outside, they work together and individually to adapt to their surroundings and situations. They often complain when they first go outside that it's too cold or that they don't like the wind, but they soon build resilience through creative problem solving, using their imaginations and working together, all of which are key elements of our schoolwide character development program."

She shared an example:

> On one occasion, a child was having fun running outside, ran right into a tree and immediately succumbed to tears. We first checked for injuries, then talked about how it happened, how he felt, and empathized with him. Next, we brainstormed about how this happened in the first place and what could be done in the future to prevent it from occurring again. Through these types of experiences, children are able to grow and adapt. Students become more resilient, and they are then able to explore with more confidence. These situations also provide opportunities to learn and practise empathy and respect. I get excited when I see examples in a class grouping of these extremely important qualities building amongst students.

This has been especially important during COVID-19. As Abi said, "We are finding that, currently, kids in kindergarten—and, really, all ages—are missing those opportunities to develop social skills. Right now, the uncertainty surrounding teams, clubs and group lessons in person is taking a huge toll on this aspect of children's social development. Any chance to be together in a safe environment and minimize health risks is welcome!"

## How Spontaneous Learning Creates Engagement and the Importance of Going with the Moment

"I love when spontaneous learning happens," Abi told me.

She emphasized that this happens "all the time when you take students outside. Those experiences just arise as you explore, and you must take advantage of them to further learning and practice."

She shared a story from her class:

> We have delighted in discovering slugs underneath oak leaves, muskrats surfacing in local ponds and swimming to shore, and migrating geese establishing nesting grounds. Once, we discovered very active, fearless voles in the green space surrounding a local storm pond. They had created holes and tunnels in the grasses we had passed many times, and they were jumping everywhere. This was a tremendous opportunity for children to appreciate their place as the visitors in another species' world.

As an educator, Abi finds that going with the moment in a hands-on way is key to creating meaning: "Going with the moment, especially now with COVID and our need to adapt quickly—allowing activities to evolve spontaneously outdoors—just keeps it real."

## Building Community Connections and Empathy in Students

Taking students outdoors and into the community helps them build connections to the community and develop empathy for the community members.

As an example, Abi shared how learning about walking on the sidewalk, versus treading on community members' lawns, develops an awareness and empathy for others in her kindergarten students. They become aware that if they walk on the sidewalk, they should be careful to respect the time and effort the neighbourhood people have spent keeping that space clean and safe. For example, "You never know if someone who shovelled that walk after a big snow was a person who would have a hard time re-shovelling."

The benefits are reciprocal: "People in the community see the children as active learners in their neighbourhood. It builds community connections between citizens of all ages."

Abi told me a story about a city employee surveying street construction who agreeably stopped his work to explain to the children why he was taking pictures of the road. When the kids saw him again on their next day's walk, they yelled, "Hi, Toby!" Abi related, "Toby was thrilled to be a celebrity for a moment, as the kids were so excited to see him! In moments like this, we are able to connect safely with workers in our community, and they start learning about traffic safety and crossing streets. We're practising good awareness and life skills while also getting exercise."

## Finding a Connection to Nature in an Urban Setting

Although Abi teaches in an urban environment, she stresses that natural elements and spaces can be found anywhere. A lot of development has been taking place in the immediate area surrounding Abi's school. This has helped direct meaningful, thought-provoking discussions with her class. She asks her students questions such as, "How do you think building all these new roads, houses and stores is affecting the birds and other animals in our area who depend on the land for survival?" Storm ponds are being built, and the students can see how that is impacting the neighbourhood and the wildlife, as well as mitigating damage to the environment in other ways.

As far as engaging with city spaces, Abi stressed that "there's not always as much nature to observe as you would like, but you can create nature spaces. You can have planted pots instead of a garden in the ground. You can grow vegetables and plants in containers—building up, not out. Your local permaculture and horticultural societies will be able to support you."

She shared, "My passion is the outdoors. One of my suggestions is to look at what you have, not what you don't have. The book *Be a City Nature Detective*, by Peggy Kochanoff (2018), talks about lichen and moss and how it will grow in the sidewalk spaces. It just shows that nature tries to grow everywhere, so getting outside—you will be able to find that connection."

## Fostering Changing Perspectives

Time spent outside with students creating these newfound outlooks often deepens their understanding of local and global concerns. As Abi said, "Everything we learn in our daily outdoor time can be extrapolated to some practice at the greater global level."

Abi related the following story:

> There is a park near us called Coal Mine Park. It was just a vacant lot full of deadfall and construction trash for months. A local community teacher-activist spearheaded building a pollinator garden and set of interpretive trails in this space, touting the project as a boon for the school community nearby. The city met with school staff for input, and now we have a beautiful forested natural space within walking distance for all age groups at our school. It is a little oasis with a gravel path, signage, a few seats and a lot of space to explore. Pileated woodpeckers, rabbits, small rodents and evidence of deer abound. The same teacher-activist advised our school community on the construction of another pollinator garden and community food garden on our school property. We have now contributed to creating a corridor for pollinators in the community, and many school families are on board with extending the idea in their own growing spaces at home. This is the ripple effect at its best!

Coal Mine Park provided another lesson in perspective, awareness and empathy for Abi's kindergarten class:

> I remember hearing and wanting to expand on the saying, "You don't know how someone else truly feels until you've walked a mile in their moccasins." The saying specifically avoids the words "in someone else's shoes," because moccasins have a soft bottom and you feel everything beneath your feet more intensely in them than in hard-soled shoes.

One day, before we left the classroom for our morning walk, I asked the students to bang on the bottom of their

shoes to see what they felt. I asked them, "Can you feel much?" Of course, the students could not feel much through the thick soles of their shoes. The class then travelled to the pathway through Coal Mine Park. I invited the children to "take off one of your shoes and try walking with one foot in your shoe and the other just in your sock." The children quickly discovered that their two feet felt very different—one felt every detail on the exposed path, while the other was dulled to the details of the surface, due to the "protection" of the sole of the shoe. The children discovered that walking over the leaves on the path was a lot more comfortable than walking on the small rocks.

This led to a conversation about our own sensitivity to our environment and how we perceive our surroundings through our five senses, particularly touch, as in this case. We then talked about the lifestyle and clothing of Indigenous Peoples, who likely walked this very ground, long before our families came to St Albert. I asked the class to think about the first people who walked here. "Do you think they had shoes like yours? They felt the ground underneath them through the soles of very different footwear. They knew their world in a very different way because they were closer to it." This spawned even further discussion about how we see and treat our surroundings today, and how we can change our perspective to be more responsible, aware citizens.

It is evident that experiences like these have support from parents and the community. Abi shared, "Even though the kids were sent home with filthy feet by the end of that day, I never heard a complaint from the parents. This was because the kids themselves came home excited, with the positive perspective and understanding of a connection to nature and a sense of history."

## Dealing with the Challenges

The connection to learning built through combining curriculum and time in natural spaces is key to Abi's strength as an educator. However, that doesn't mean there aren't any challenges.

Abi said, "For myself, the challenge in getting children outdoors is within my comfort zone, and I believe that with the right support, it is completely surmountable in any school setting. I think people interested in pursuing more outdoor programming need to begin with bite-size chunks in their comfort zones, and support from others who have done it. Outdoor education extends beyond the focus on physical activity outside."

Many classroom teachers struggle to justify time away from the classroom—the setting in which they are accustomed to teaching and achieving academic goals. Abi suggests that these educators consider, "What are things you now do indoors that you could do outdoors?"

For example, a teacher needed to complete a poetry unit with her students and wondered if they could somehow connect this with an outdoor adventure. Abi and the teacher worked together and decided to take a walk with the class to observe and record characteristics of two different items along the way (rock/tree, puddle/cloud, bird/dog, pavement/grass) as inspiration for their writing. The students then used their recordings to write relevant diamante poems. Not only did they need to rely on their observations but they also had to understand the use of language (nouns, adjectives, verbs, participles, adverbs) in order to complete the poem successfully. Finally, the students were invited to illustrate their two subjects and display their combined efforts for others to enjoy. Abi said, "This experience gave the teacher formative and summative assessment of a number of curricular elements, and students made new connections with their immediate environment near the school. It was a win-win for all!"

Abi offered the following final thoughts:

> In making space for outdoor time that's connected to learning, teachers can see the relation of many different things to the curriculum. I can remember somebody saying to me in a casual conversation years ago, "Outside—that's where we all came from. No matter how high you build a skyscraper or thick you build your walls, that is where we come from. If you go out there to learn, you acknowledge the very roots of our existence. You can't deny that the outdoors sustains us."
>
> The one thing I would be sure to take with me to a far-off land would be the footwear that would enable me to navigate new terrain safely. I thought about saying that I would put my camera first, but without footwear to safely traverse my surroundings, I wouldn't have a way to kinesthetically experience what I want to record visually. My hope is that my mind's eye would record and recall the experiences through which my feet have carried me, so I may share my story authentically.

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# Enriching Geometric Understanding Through Early STEM Pedagogy

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Attention to science, technology, engineering and mathematics (STEM) education has been rapidly growing nationally and internationally (Sengupta, Shanahan and Kim 2019; Takeuchi et al 2020). In Alberta, STEM is not yet a curriculum subject in itself, although related pedagogical efforts—such as makerspace and design-based learning—are being taken up in Alberta schools.

STEM is a relatively recent domain of studies in the education field. In the EBSCO Academic Search Complete database, the term *STEM* first appears in education journals from the early 2000s. Since then, the number of publications on STEM education research and teacher development resources for STEM education has significantly grown.[1]

Despite this growth, there is a scarcity of research on STEM education in the early years (kindergarten to Grade 3), compared with the research on secondary and postsecondary STEM education, which could be partially a result of the implicit research agenda of preparing students as future workers for STEM industries (Takeuchi et al 2020). An aesthetic vision for STEM education that centralizes *seeing more* and *seeing the complex* (Farris and Sengupta 2016) stands apart from those instrumental visions focusing mainly on workforce preparation. Aesthetic expansion through STEM education enables learners to make familiar phenomena unfamiliar and to notice previously unnoticed elements and meanings in those phenomena. What does STEM education in the early years look like when the teacher aims for aesthetic expansion?

This article sketches a scene of students *seeing more* in geometry through an early STEM class in Alberta, designed by the mathematics and STEM learning leader at the school. All students in the school experienced a one-hour STEM class twice per week. The teacher arranged the classroom space (by removing individual desks and seats) so that students could move their bodies freely. The classroom housed commercial resources (such as Lego Mindstorms robotics kits, Sphero robots and Ozobot robots), and the teacher also created a free makerspace with a collection of recycled materials (Figure 1). The teacher actively used the classroom wall and the hallway to document and demonstrate the process of the students' projects, highlighting the design cycle (Figure 2). The final iterations of the students' creations, as well as their initial plans and photos of the process, were included.

The school was located in a neighbourhood with many apartment buildings, where many recently arrived immigrant and refugee families had settled. Approximately 90 per cent of the students were identified as English-language learners, with various home languages.

FIGURE 1. Recycled materials for the free makerspace.

FIGURE 2. Classroom wall displaying students' work.

In this article, we demonstrate how students in a Grades 1/2 combined class learned key mathematics concepts in this STEM classroom by describing the students' learning during the final project of the year. The students received two STEM classes per week, and this project took place over six weeks. We will focus on two students, Alex and Hakim, who were both newly arrived students and whose first languages were not English.[2] We videotaped classroom interactions over six instruction days and repeatedly reviewed the videos. We identified the trajectory of engagement by Alex and Hakim as illustrative of the learning that was happening in this STEM class.

In the final project, the students created an art piece with geometric shapes that they had been learning, using Sphero robots as paintbrushes. Each phase of this project presented unique mathematical learning opportunities, as demonstrated in the following sections.

## Understanding Polygons Through Coding

In many early mathematics classrooms, students explore polygons by describing, sorting and comparing provided shapes. In this interactive STEM classroom, the teacher started by challenging the students to draw various polygons based on their definitions.

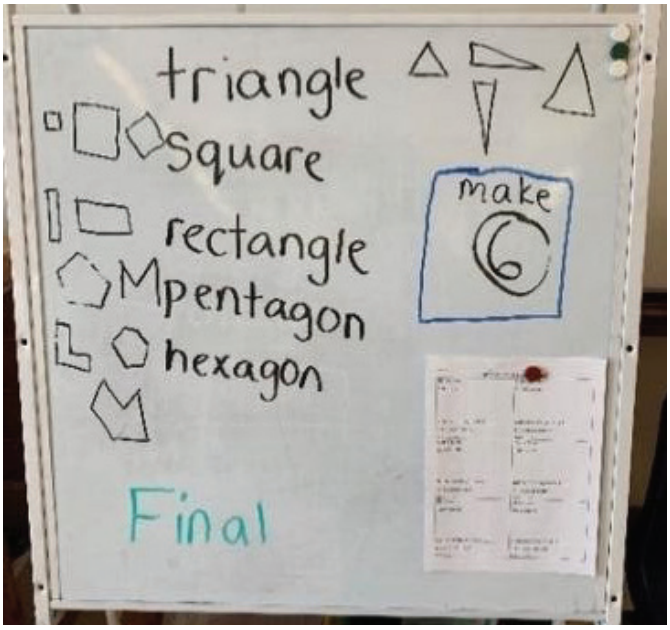


FIGURE 3. Teacher's sketch of the shapes students drew (through gestures).

Figure 3 is the teacher's sketch of the shapes students drew (through gestures). Not only did the students recognize the regular hexagon shape, but they also drew two other shapes that, by definition, are both valid hexagons (six-sided polygons). Many of the students' existing understanding was based only on exploring regular polygons, such as those found in pattern blocks. As a class, they explored the idea that any closed shape with six sides is a hexagon, even if the sides are not equal.

The students' understanding of regular and irregular polygons was continually facilitated as they thought about how to code a polygon. After free exploration with Sphero robots and graphing software that tracked the movement of the Sphero, students engaged in discussion about how to code a polygon, as seen in the following interaction:

TEACHER. Some triangles have all equal sides, and some triangles are really pointy and long and skinny. Some triangles have some big corners and some small corners. Some triangles point this way or this way. *(Gestures her hands toward two different sides of the room.)*

STUDENT. Triangles can go in any way!

Again, Figure 3 shows that the students were aware that even triangles can have different angles and directions. The teacher then showed them an example of code with three blocks, as shown in Figure 4.

The following interaction shows the student's understanding that there must be three blocks of code for a triangle, because a triangle has three sides:

TEACHER. If I'm making a triangle, why did I start with putting three blocks of code?

STUDENT. Because the triangle has three blocks.

TEACHER. Has three . . . ? Do you remember what we call those? *(Makes a triangle with her hands and uses her right index finger to draw along the side of the triangle on her other hand.)*
STUDENT. Has three sides.

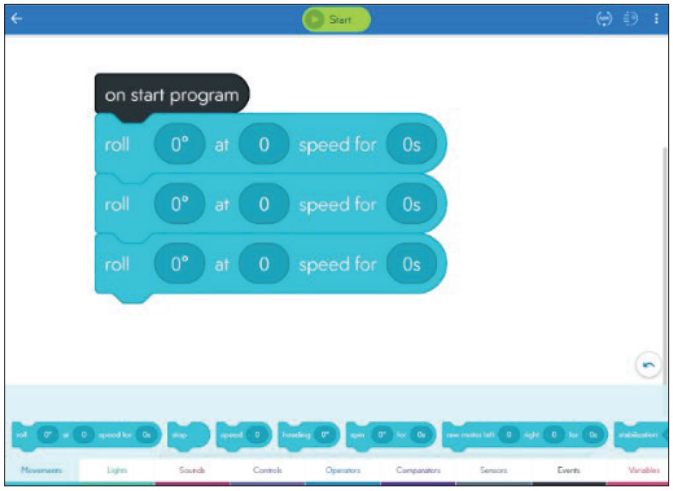


FIGURE 4. Example of code for a triangle.

In this interaction, the teacher brought the student's attention to a mathematical term—*side*. However, instead of correcting the language the student used *(blocks)*, the teacher amplified the linguistic cues with gestures to facilitate fuller student participation in the linguistically diverse classroom, as discussed by Takeuchi and Dadkhahfard (2019).

After this class discussion, the students worked in pairs to code the Sphero robots to roll in the shape of polygons of their choice. By the next class, Alex and Hakim had successfully made two quadrilaterals and a triangle. After this practice with the programming language, they challenged themselves by attempting to create a more difficult shape—a pentagon.

They started with five blocks of code for the five sides of a pentagon and programmed angles, speeds and time (all seemingly guesses) into the code. After their first test, they noticed that the Sphero had made an L shape, not a closed shape like they wanted. They decided to increase the numbers on the speed and then test the code again. They then saw that the Sphero had traced the same L shape but on a larger scale.

They concluded that they needed to change something in the code other than the speed. Alex took the tablet and stared at the wall, as if trying to picture a pentagon. He then changed the angles in the code. They tested the code again, with the new angles, and found that the Sphero was making a different shape and kept running into walls.

They decided to test their code in a bigger space (the hallway), and Alex changed the angles again. This time, he drew the shape of a pentagon in the air with his right index finger, moving the angles on the code with his left hand as he came to each point of the shape he was drawing with his right hand. He then turned to Hakim excitedly and shouted, "I fixed the program!"

FIGURE 5. Hakim using visuals to correct the code.

By the end of this class, Alex and Hakim had successfully adjusted the angles in their code so that the Sphero almost made the shape they wanted; however, the lengths of the sides in the code were off, so the Sphero did not yet make a closed shape.

During the next class, Hakim worked to ensure that the angles in the code would make a pentagon and that he had the right number of seconds coded so that the Sphero would return to where it had started, making a closed shape. To do this, he drew the pentagon he wanted on a small whiteboard, as pictured in Figure 5. He drew lines as markers along the edges of the shape to estimate how far the Sphero should be moving along each side. He eventually got the code to a point where, as he said, "it [the Sphero] came back," making a closed pentagon shape, as pictured in Figure 6.

FIGURE 6. The pentagon shape created by the completed code.

Through Alex and Hakim's creation of the code that made the Sphero move in a closed pentagon shape, we can see the thought process of computational thinking

that they engaged in while getting to the shape they wanted. They started by creating a code with the right number of blocks but estimations for the angles, speeds and time, to see what the Sphero would do. As they became more fluent in the programming language, and as they came to understand how the code translated to the Sphero's movement, they were able to make more accurate adjustments to the code to make the shape look more and more like a pentagon. After they had created a shape with more reasonable angles, they used a visual tool—the grid on a whiteboard—to measure how far they wanted the Sphero to roll along each side. These acts of mapping out the shape and estimating the numbers for the code based on a drawing show that they were able to use their learned knowledge of shapes and programming to help them get the pentagon they wanted.

## Painting with Polygons (Scaling)

In the next phase of the project, the teacher explained to the students how they would be using the codes they had created to paint their shapes with the Sphero. To do this, they would need to adjust their programs so that the shapes would be small enough to fit in the cardboard Sphero Arena (Figure 7).

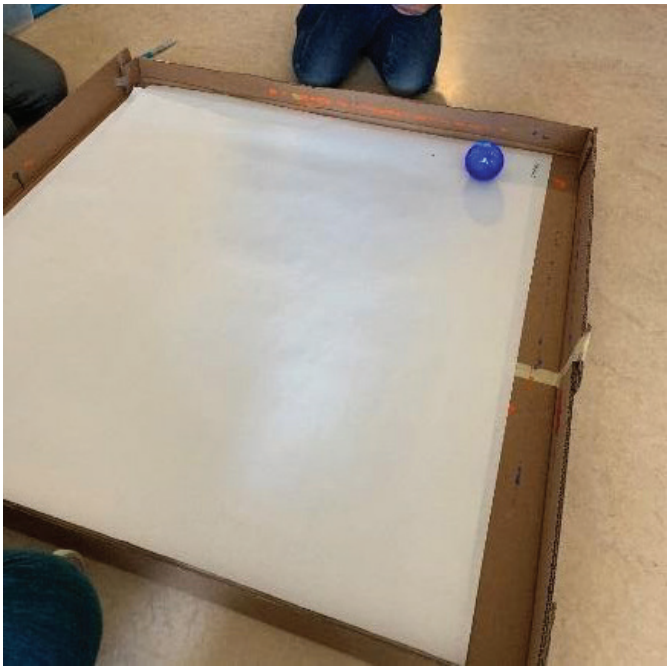

FIGURE 7. The Sphero Arena.

The teacher talked to the students about the ways they could test their shapes to see if they would fit in the arena and gave them the option of estimating whether the shapes would fit. Through an open discussion on how they could scale their shapes, the students verbally showed that they understood the relationship between the code and how the Sphero would move. For example, one student suggested, "You could change how many seconds it goes for." This student and others demonstrated that they grasped how changing the time and the speed in the code would translate to the size of their shape, showing that they were figuring out how the mathematics and the technology worked together.

As they started to use the Sphero as a paintbrush, Alex and Hakim made sure that their pentagon would fit inside the Sphero Arena by estimating its size. They then went to the arena to test their program and paint their first shape. After testing the code, they found that their pentagon fit "perfectly on the paper," which they were ecstatic about.

With that, Alex painted a pentagon on his paper, and the Sphero moved around as expected to form a pentagon. It fit almost perfectly. During Hakim's attempt, the Sphero got stuck and was not positioned the way he wanted, as pictured in Figure 8. He was upset that his pentagon did not look the way he wanted. The teacher pointed out that even though it was not quite as they had pictured it, it was still a pentagon. She said, "Do you think that making a five-sided shape deserves a high-five?" Once the teacher had acknowledged Hakim for accomplishing such a difficult task, he was satisfied with and proud of what he had created.

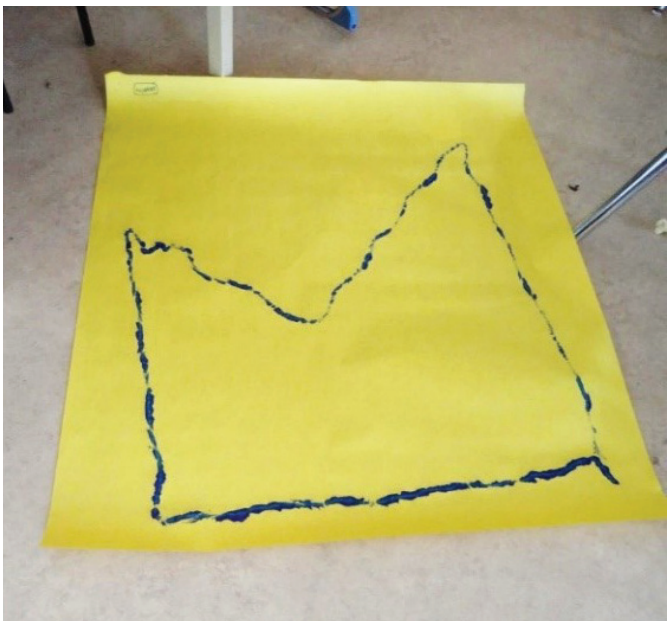

FIGURE 8. Hakim's finished painting of a pentagon.

By the last class, the students had all painted one shape on paper, using their codes. The teacher then encouraged them to paint a second shape so that it overlapped the first shape. She talked to them about thinking "like an artist" as they thought about how they could overlap their shapes, and she explained that artists overlap shapes in various ways and that often artists have shapes at different angles crossing each other. The

teacher then explained that before they painted the second shape, the students would need to determine whether it would fit in the Sphero Arena by "eyeballing" (or estimating) it.

When the students went to work on their second shape, Alex and Hakim fixed one of their previously coded rectangles to make sure that it was a closed rectangle that would fit in the Sphero Arena. When they brought the Sphero over to the arena for testing, the teacher noticed that the angles were out of order and went over it with Hakim. She helped him see that the code made an L shape instead of a rectangle and then helped him reorder the code. When they tested the program and found that the rectangle fit, Alex got excited: "It's perfect! We can go in any rotation!" He explained that because of the size of their rectangle, they could put it anywhere on the paper, in any direction, and it would fit over the pentagon.

Alex and Hakim finished creating their artwork, and they put the rectangle in different spots over the pentagon, so that their paintings would be different, as pictured in Figures 9 and 10.

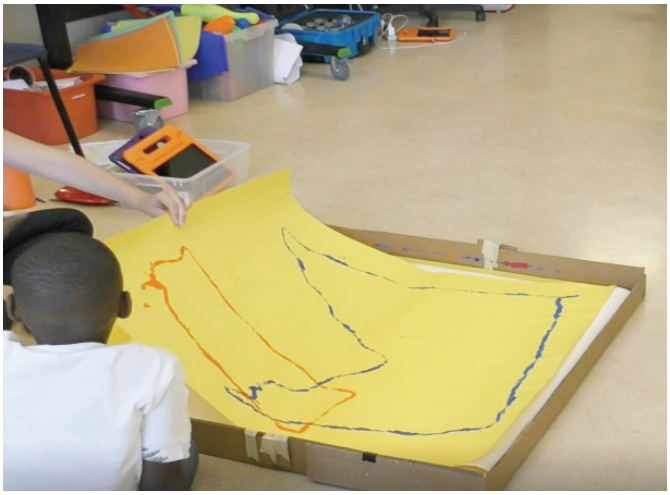

FIGURE 9. Hakim's STEM final project.

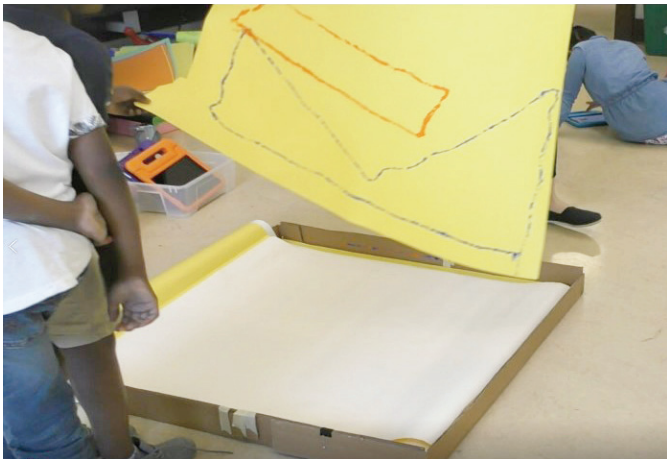

FIGURE 10. Alex's STEM final project.

By the end of this project, both Alex and Hakim showed an understanding of how the program worked and an ability to alter their code in order to fix errors in it until it ran the way they wanted. They also showed that they had developed emotional connections with the project. This was evident in their disappointment when the artwork did not look the way they had imagined it, as well as in their excitement and happiness after it finally came together and they could see the finished product.

# Conclusion

If we were to ask Grade 1 students what a pentagon looks like, not many would picture what Alex and Hakim coded as a pentagon. The students in this STEM class started *seeing more* (Farris and Sengupta 2016) in geometry as they traced the movements of the Sphero robots they had coded. Coding was not the end in itself in this STEM class but, rather, a secondary skill taught as a means to explore geometry more deeply.

As it was the end of the school year, the teacher designed a project in which students could paint a take-home piece by arranging polygons of their choice. The students' pieces were all different and uniquely reflected their ownership, as seen in the case of Alex and Hakim.

Sphero robots were used in this lesson, but we are not necessarily advocating the use of Sphero (or any other commercial product that may perpetuate the instrumental agenda of STEM education). Nor are we implying that STEM class is defined by the use of technology itself. Instead, what we have shown here is how one technology can serve multiple purposes when the teacher's pedagogical hopes are clear.

To create this STEM class, the teacher removed siloed desks in the classroom to facilitate collaboration and to create an open space where students could move their bodies freely. The teacher brought in recyclable materials from home for students to transform through their designs. In this classroom, by tracing the movements of Sphero robots in the Cartesian coordinate system, students started to see the relationship between code and the elements of a polygon (angles and sides). As they painted with the Sphero, they encountered the notion of scale. In this pedagogical space, we demonstrated how students' mathematical conceptualization became genetic, which Piaget (1970, 2) characterizes as "continual construction and reorganization."

This early STEM class allowed the curriculum to be connected vertically, as well as horizontally. In terms of Alberta's mathematics curriculum (Alberta Education 2007), the lesson described here addressed key curricular expectations for each grade level—for example, "replicate composite 2-D shapes" (p 15) for Grade 1 and "describe, compare and construct 2-D shapes" for Grade 2 (p 18). However, the lesson could be adapted to

stretch students' learning to deeper concepts—for example, "identifying examples of angles," "classifying angles" and "demonstrat[ing] the sum of interior angles" in geometric shapes (p 37) for Grade 6. This project could also be connected to Alberta's art curriculum (Alberta Education 1985)—for example, "shapes" and "movement of figures and objects" (p 5). In this sense, what we have documented in this article shows an expanded possibility for student learning in early STEM curriculum and pedagogy.

In these times, as we work collectively through the COVID-19 global pandemic, projects like this increasingly show their importance in early childhood education. In the midst of the pandemic, many educators are experiencing heightened difficulty in helping their young students understand abstract concepts, such as constructing and scaling shapes, with limited access to tangible learning tools that students can manipulate. Documenting pre-pandemic pedagogical innovation by teachers in public schools is, thus, important as we envision and reimagine post-pandemic education.

We asked the students, "What does STEM education mean to you?" Alex responded, "We can be scientists, and we can be anything!" As more crises arise in our world and our lives become more dependent on mathematical understanding (with and without technology), it is essential for young learners to see themselves in roles that will help advance the world they will live in.

# Notes

1. See, for example, *STEM Education by Design: Opening Horizons of Possibility* (Davis, Francis and Friesen 2019), which was published in alignment with the teacher education course offered at the University of Calgary.

2. The names of the students have been changed to protect their anonymity.

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# Waves of Reflection: Becoming Reflective Science Educator

*Poh C Tan*

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In this article, I share my experiences as a scientist and a science educator. I interpret my professional and personal stories through reflection to understand and gain different perspectives of my teaching practices. I highlight three moments from my experiences that caused me to pause and to reflect on how I teach science to young children, including my two young sons. Based on Donald Schön's (1983) reflective theories, I reflected on my teaching practice, observing and conversing with my peers and colleagues, and through the work from and with the children. Reflective practice helped bridge the gap between what I thought I knew about teaching science with how I was teaching science to young children ages four to six years old. Recognizing and being more aware and conscious about these moments encouraged me to re-evaluate my role as a science educator. Waves from the ocean build and continually shape the shore and land around us, and with each reflective wave, I am continually becoming a science educator. The constant learning, relearning and becoming with my peers and the children helped me identify different ways to convey science and scientific concepts between how a scientist and a science educator views and teaches science. The practice of science in a laboratory is akin to the practice of science in the classroom because practice contributes to the *becoming* scientist and *becoming* science educator (that is, questioning, hypothesizing, experimenting).

As a scientist, I was trained to think in methodical ways and was encouraged to focus on meeting technical goals free from the influence of personal opinions and emotions on the application of the outcome. As I progressed in my scientific career, I began to reflect and realize that a consequence of research may result in potentially adverse impacts or be driven by special interests. For example, science has made breakthroughs in creating and developing vaccines to prevent outbreaks in the human population. For the past 40 years, the safety of some vaccines is tested by harvesting blood from millions of horseshoe crabs leading to the significant decline of their population year after year (Maloney, Phelan and Simmons 2018). For the health and well-being of humans, the horseshoe crab has become an invaluable tool in the laboratory to ensure vaccines are safe for the population. As a scientist who often works with animals, it has never occurred to me to give a moment to the well-being and role of these animals (for example, horseshoe crab) beyond an investigative tool for research. Consideration for the "tools" used in the laboratory began to change and became more significant when I had my first child and started teaching him about different scientific concepts. My realization toward the need to become a different science educator arrived when my son was only able to recite facts but had no relational connection to the concepts he learned. This disconnection is also present in scientists who conduct their experiments from rote memory without a relational connection to the "greater picture" and thus may contribute to the challenges of retainment and understanding of scientific concepts.

Schön (1983, 40) describes that "in real-world practice, problems do not present themselves to the practitioner as givens [and they] must be constructed from the materials of problematic situations which are puzzling, troubling, and uncertain." My realization became more significant when I had my first child, and I

began to wonder about the society he would grow into and the values that he'll use to guide his life. This turned into a self-reflection process of my place in the world, and I began to question who I wanted to be and what values defined me. I realized how much my beliefs and values have progressed from when I first began my journey as a scientist and now to a science educator.

As I progressed in my second doctorate in the Faculty of Education, being critically reflective became an integral component and is an "on-going process of self-reflection and analysis" (Dobson 2009, 151) in becoming a science educator. Diamond and Mullen (1999) state:

> Teacher development is self-directed and cannot be imitated or imposed. What develops is neither a collection of treasured "tips" nor a hoard of guarded self-deceptions. Rather what develops is a theory of a more effective teacher-self that is constantly "put to the test" so that richer explanations of ongoing practice will result. (p 68)

Reflective practice is often promoted in the fields of education, health and social care (Brock 2015, 7). Reflection, according to Dewey (1997) is what makes us "human." He explained reflection as "active, persistent and careful consideration of any belief or supposed form of knowledge, and that reflective practice is the action of reflective thought."

As a science educator it is not only important to instill content knowledge in my students but also to educate them to become responsible, scientifically literate individuals who can think critically about the information they are receiving, and to inquire and identify fact from fiction, which would empower them to make important choices and decisions as citizens (Miller 1998). Hanson (2011) showed that educators who engage in critical reflections can evaluate their assumptions, expectations and interpretations of themselves and the children they teach.

For the scope of this paper, I will focus on reflection and its role and importance in science education. I will then describe and discuss three teaching moments with my son, Khafri, followed by three waves of reflections from these moments. I will conclude by discussing how these waves helped support teaching science to my four-year-old son.

# Self-Reflection and Teaching Science in the Early Years

Early childhood educators (ECEs) recognize the significant role they play as teachers during the early years of learning and development of a young child. The College of Early Childhood Educators (CECE) outlines the importance of learning in practice that leads to self-directed learning and professional development (CECE 2017). According to the Ontario Ministry of Education (2007, 19),

> reflective practice refers to the systematic, reflective, collaborative process used by early childhood educators to plan, evaluate, make decisions and create and implement change through consideration of relevant literature, current practice learning environments, observations of children's development, behaviour, social interactions, learning and knowledge of families.

As discussed by Calderhead (1989, 44),

> reflection is viewed as a process of becoming aware of one's context, of the influence of societal and ideological constraints on previously taken-for-granted practices and gaining control over the direction of these influences.

Individual early childhood education (ECE) teachers have unique teaching methods and practise self-reflection daily (Eva To, personal communication, August 2014) to continually evaluate and assess their teaching practice in the classroom. This daily practice helps ground their values and beliefs and helps them understand their practices, behaviour and teaching methods. Ms Eva motivated me to self-reflect with my own teaching and parenting, and I discovered subtle surprising moments with young children that were not surprising to practising ECEs. Through the act of observing, listening and conversing with my four-year-old son, I found that children were not only inquisitive but that their curiosity about their learning environment encourages them to pursue answers that often challenge the educator. Khafri was never satisfied with single answers I gave him, and he seemed to enjoy challenging me with new ideas and new perspectives.

I often used such moments to reflect deeply by being more aware of what my role as a science educator meant. Reflective wave one was my first moment of self-reflective practice, and I describe this moment of discovery with Khafri and his questions about a "blob" on the front cover of a science journal.

## Reflective Wave One

> Khafri was three and a half years old, and he was hungry for knowledge. We read five to eight books together every night before he went to bed. As with any nights, we read stories about animal friendships, a little boy's encounter with a fish and a friendly monster who was afraid of his closet. One night he noticed one of my scientific journals that I had left on my desk. He noticed an interesting image on the cover page. He pointed to the image and asked what the "bubbly" blob was and why I was interested in reading about it. I told him that I used the information from the journal for my research and quickly instructed him to put the

journal back on my desk and to come back to his room for bedtime reading. Khafri was persistent and continued to ask me about the image. He insisted that I tell him about this bubbly blob and how it looked like one of the monsters in his book. I told him that it was a little complicated to explain about the blob. I took the journal from his hand, placed it back on my desk and guided him to his room for bedtime.

Following my evening routine, after Khafri went to bed and fell asleep, I sat at my desk to do my work. This time it felt different; it was as if the image of the blob was "looking" back at me. I stared at the blob for a few moments and I asked myself these questions:

- What was so fascinating about a black and white blob? (The blob was a transmission electron microscopic image of a macrophage, that is, a white blood cell.)
- Where would Khafri's curiosity lead him if I had conversed with him about the blob?
- How can I tell him about this blob so that he would understand it beyond the picture on the journal?
- Why did I think he was not ready for topics that, to me, seemed too complex for his age?

These questions led me to ponder about my role as an educator and as a scientist, and reflecting on my encounter with Khafri led me to discover that his curiosity was very much like mine. Khafri was becoming an educator and a scientist. According to Vieten (2009), curiosity is one of the most powerful forms of love and respect one can show for their child. Truly wanting to know more about a child's perspectives, where their thoughts come from, what they like and do not like and asking why, are the most intimate communications caregivers and educators can convey to a child. As an educator, "moments when a student wants to know are marked with excitement and what teachers call a 'teachable moment'" (p 122). Teachers know when they ignite curiosity, a student will seek to understand. "The energy of wanting to know can overcome hesitation, doubt, comfort, and fuel motivation to energize into action" (Romano and Simonyi 2002). Similarly, as a scientist, curiosity drives motivation and dedication to maintain resiliency that leads to scientific discovery and progress. My son's curiosity about the blob on the front of the journal was my teachable moment to reflect on the type of educator I needed to be to support and fuel the curiosity of science in young children, like my son.

# Peer Reflection and Teaching Science in the Early Years

In addition to self-reflection, peer reflection creates a space for sharing and discussion of teachable moments. Peer reflection gives "[i]nsights into personal practice that are gained both from the act of observing as well as from being observed [by others]" (Martin and Double 2006, 161). According to Martin and Double (2006), peer observation and reflection can occur through three phases: (a) the pre-observation meeting, (b) observation and (c) feedback meeting.

The pre-observation meeting enables the observed person to brief the observer on the specific nature of the event to be shared, and the observer must be clear about the teaching program [and] learning intentions for that particular session and the teaching strategies to be adopted (Martin and Double 2006). During the observation period, the observer is involved in the experience without being drawn into dialogue of intellectual debate, and to be effective, the observations must be of both the teacher and the students (p 163). The observation period represents a psychological phenomenon that when a person is being observed performing a familiar task, the observer can be inclined to take on the role of an expert irrespective of their actual level of competence (p 164), and thus it is important to be aware of overextending this role during the observation period. The observer's awareness can be as "useful as a formative process [to] recognize strengths and suggesting possible areas for attention or alternative approaches, rather than simply judging" (Gibbs 1995, 149). In the final phase, the feedback meeting provides a space for collaborative reflection. Reflective questions are asked without judgment, and the observer is reminded that they are in a safe learning space. This collaborative reflection through conversation helps the observed to align what they do each day and use the information they gather to make informed decisions with making and being more aware of their teaching and learning moments with the students.

Reflective wave two describes my observations with my peers who are early childhood education teachers. In this wave, I describe observations I made of two teachers, who dealt with challenging situations in the classroom differently. In this teachable moment, I was the observer, not from the perspective of an expert but from the perspective of a learner.

## Reflective Wave Two

Teacher one: I was volunteering in a preschool in the city of Richmond, British Columbia. The school was attended by 10 children between the ages of three and four-and-a-half years old. Eva To is an ECE teacher, and she frequently and routinely used reflective practice to help understand her classroom practice and shape the learning environment for the children. For the past three weeks, she introduced the children to dinosaurs. She talked about life cycles and the animals' eating behaviour, and explained extinction. Ms Eva observed her children's excitement about dinosaurs,

and they often imagined their bodies as dinosaurs. Some children used their voices to imitate what they thought dinosaurs sounded like in the past. Other children acted out the animals' feeding behaviour. One child in the group often played the role of tyrannosaurus rex (T Rex) during storytelling and singalongs. He stood up to make loud stomping noises during storytelling and snapping noises during singalong. Some children expressed to Ms Eva that they were angry because they could not hear the story and because they feared that he would accidently stomp on their leg.

Ms Eva approached him in a gentle way, led him to another area in the classroom and talked to him about how other children were upset and uncomfortable when he made loud noises and forceful movements with his body. She used slow hand movements to hold his hands while talking to him and spoke in a direct but gentle tone. She attentively used her eyes during her conversation to reassure him that he is still loved in the classroom. She sat with him and encouraged him to watch how the other children played. When he was ready, he joined the group and played T Rex, but with more calmness and awareness of his friends.

The following teachable moment is an observation of a teacher in a different city in British Columbia. In July and August of 2015, the district principal invited me to teach science to Grade 5 students at an elementary school. Though I do not hold a teaching certificate, I have developed and taught science lessons to elementary and secondary students. In addition, I work closely with the teacher to ensure that my science lessons complement her curriculum. The science class is an extension of the science curriculum and is offered in the summer term (June–July) for about six weeks. Teachers are assigned to different schools to teach the summer program, and the students who attend the summer session are not ones the teachers usually teach during the school year.

Teacher two: I was invited to coteach the class with an elementary schoolteacher. My role was to create scientific activities that provided opportunities for the students to learn about collaboration and teamwork. Examples of some activities I designed taught the students about force and motion, bacteriology, cell biology and the application of the scientific method. There were 15 students in the class, and classes were scheduled from 9 AM to 1:30 PM. When I was finished conducting my activities with the students, I stayed until the end of class to observe the students and the teacher. On most days, I observed the teacher's frustrations with the students. She often complained about some of the students and about her disinterest in teaching science. During all science sessions that I was part of, the teacher picked chapters from a science textbook and selected a few students to read sections of the chapter aloud to the class. The teacher often selected David (name changed to protect identity of child) to read one or two paragraphs from the chapter. During all my observation periods, David always said, "No," or "Why me?" or "I don't want to," or "Mary (name changed to protect identity of child) can do it." Reading sessions were often paired with writing sessions where the students were given time to read sections in the textbook then asked to answer questions from that section. In one writing session, David chatted with his friends and seemed uninterested in the writing exercise. The teacher approached me and quietly asked, "Can you please go and sit with him and get him to start writing his report? He hasn't written anything. I can't deal with him right now," as she expressed her frustrations. I replied, "Yes, sure." I walked toward his desk and sat down next to him. I noticed he wrote the first part of a sentence then stopped. I asked him if he needed help with identifying the correct sections to read to find the answer. He didn't answer me and instead looked around the classroom at his friends, the teacher and back at me. I asked him again about what help he needs for the questions. He stayed silent, glanced at me then back down to his hands while fidgeting with a pencil eraser. I persisted and asked, "Can I see what you wrote?" He shrugged, still looking down at the eraser. I read what he wrote and very quickly noticed the sentence was similar to primary level. I also noticed when I was reading the sentence that he was glancing back and forth to his friends and the teacher. I decided to close the book, pushed the piece of paper aside and attempted to get his attention. "David," I said. He glanced at me briefly. "David, can I ask you a question? You don't have to answer if you feel uncomfortable, OK? I want to help you," I said. He glanced and nodded slightly, while staring at his hands and the eraser with which he was fidgeting. "David, do you find reading and writing a little challenging?" I asked. He shrugged, glanced at me, turned his head back down to his hands and quietly said, "Yes, I have ADHD [attention deficit hyperactivity disorder] and OCPD [obsessive compulsive personality disorder], and I don't like being in this room with everyone." Immediately, I glanced at the teacher and I felt sympathy, anger, frustration and helplessness, all in the same moment.

The experiences at the preschool and the elementary school showed me how teachers respond to different situations in the classroom. These moments gave me insights into how situations can pivot almost immediately and how each teacher's dispositions on their practice can affect their teaching and their students' learning.

Following Martin and Double's (2006) practice of collaborative reflection, I conversed with Ms Eva and the Grade 5 teacher about the two moments. We discussed

the challenges of teaching students with different abilities, how teachers felt that day, their confidence in teaching science and their professional relationship with students. For both teachers, science is not their expertise and is not a subject of interest, thus teaching the subject becomes tedious, frustrating and, sometimes, intimidating. These feelings can significantly influence how science is demonstrated and taught to the students and thus, how the students perceive science. For example, teacher two expressed, "It's so good that you're [author] teaching the science part. I was not looking forward to teaching science because I would have had to prepare so much" (teacher two, personal communication, July 2015) to me during one of her classes. Teacher two further shared that most of her science activities came from Google searches, Pinterest and conversations with colleagues. Science activities conducted in the classroom without clear objectives or intentions become disconnected from theoretical concepts and thus, potentially affect students' interest in science. These conversations helped me recognize moments of frustrations in my own teaching practice and how I have reacted. In contrast to teacher two's frustration, mine stemmed from the lack of depth to how science is taught in the classroom. I designed my science programs to reflect each scientific concept as accurately as possible and in some cases at the detriment of imagination and creativity from the students. However, through observing and reflecting with teacher one and teacher two, I began to understand that the practice of teaching science has to mirror the students' response and interest to create meaningful and in-depth scientific discussion.

I began to empathize with the Grade 5 teacher, rather than critically judging her reaction toward David. My conversation with her made me realize that teaching science can be frustrating and upsetting when students lack passion or interest in the subject. Frustration can lead to a feeling of futility when trying to support students in their learning with any subject.

In contrast to teacher two, Ms Eva frequently documented her reflections about her students and their interactions with each other and with her to help shape her classroom projects and curriculum. In her reflections and conversations with her peers, she conveys her unique frustrations about teaching students science as more of entertainment. In Ms Eva's vignette, students' enthusiasm to become T Rex disrupted the lesson with one child's disruptive behaviour. Ms Eva's observation, response and action calmed the child to continue the lesson. Her practice showed me why it was important to form a trusting relationship with each student to allow optimal learning to occur for both the teacher and student.

Observing and conversing with Ms Eva and the Grade 5 teacher showed me the importance of patience and curiosity that helped shaped how I teach science to young children and to take the time and space to notice how children represent their learning about science.

# Reflection Through Children's Work

McCormick (2004) shows that systematic thinking and reflective thought help teachers grow intellectually and gain the ability to reason and take multiple perspectives, to be creative and to adopt new teaching practices. As my journey of discovery and learning progresses through understanding myself and teaching practices of my peers, I arrive to my third reflective wave—reflection through children's work. The US National Board for Professional Teaching Standards recommends the use of children's work to assess teaching (National Association for the Education of Young Children 1996). In general, educators often use two methods: observing and reflecting through children in action, and through the children's work. These methods were pioneered by the Reggio Emilia Approach, an educational philosophy focused on preschool education developed by Loris Malaguzzi and the parents of the villages around Reggio Emilia in Italy during the 1940s. The approach is based on the principles of respect, responsibility and community through exploration and discovery based on the interest of the children through self-guided curriculums (Edwards, Gandini and Forman 1998). By documenting their daily activities and interactions, educators reflect on their teaching methods and knowledge to inform and guide curriculum development for the child.

My observations of Ms Eva led me to notice how important it was to notice subtleties with each child's behaviour but also with their work in the classroom. For the scope of this paper, work refers to children's representation of their learning and can include drawings, paintings, songs sung, role play, conversations with peers and the educator, child conferencing, and others. Attention to subtleties in a child's drawing, the words used to describe events that are happening around them and how they interact with their friends provides many teachable moments for the educator. I began by reflecting through my own children, particularly my son Khafri and noticing the subtleties in his interactions with his friends and through his drawings. In reflective wave three, I describe a teachable moment with Khafri and our exploration of volcanic landscape in Hawaii through conversations and drawings.

## Reflective Wave Three

When Khafri was three years old, we placed him in the care of Simon Fraser University's Reggio Emilia inspired child care program. Educators provided sensorial materials in the classroom and walks around

the campus. Educators also guided the children to inquire through art, music and drama. He came home with many stories and drawings. One evening, I picked up Khafri from his class, and as we were exiting the classroom I noticed his drawing on the wall (Figure 1). The scribbles, swirls and smudges were his interpretation of his time spent with his friends and with me. He remembered the time we were trying to make footprints (Figure 1, bottom left-hand corner) in muddy patches on trails in the lush forest of Burnaby Mountain. He also drew about his time of jumping in puddles (Figure 1, box in the centre), which he interprets as holes with friends. Five months after that drawing, we went on a family trip to Hawaii. We hiked on Maui's volcanic landscape and took time to observe unique lava formations in the valley. On one of our hikes, Khafri turned to me and asked, "Mum, where are the trails to walk on? How can we make footprints? Where are the trees?" We talked about how landscapes are different between Burnaby Mountain and Maui. We felt the volcanic formations with our hands, picked up volcanic rocks and observed how they were different from stones, and about how

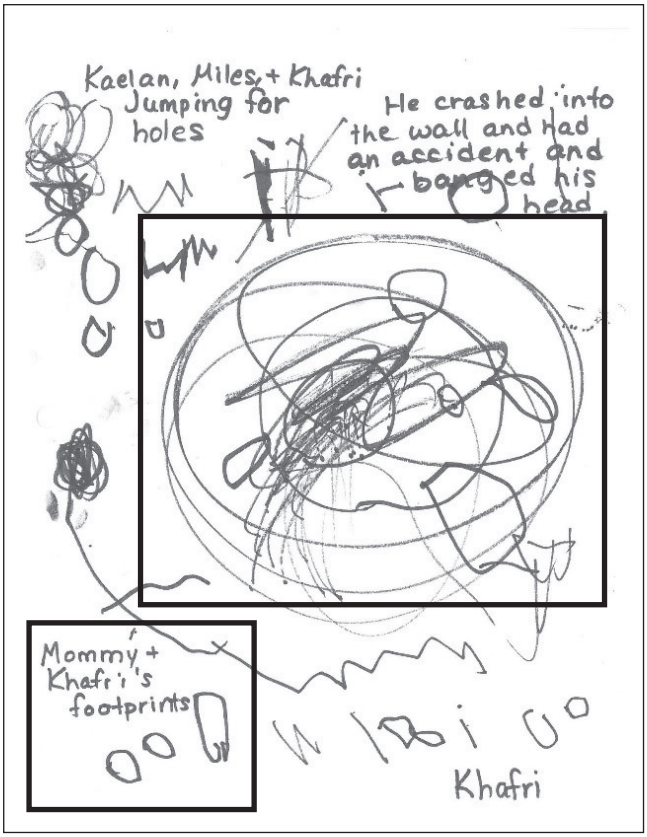


FIGURE 1: Outlined in a box in the bottom left-hand corner is an example of his memory of our trail exploration, and the swirls (box in the centre) represent the lush forest of Burnaby Mountain.

there were no trees in the valley. Khafri asked about how he could make footprints on the arid landscape. Furthermore, he asked, "Mummy, can we put some trees here?" and "Can we pour water to make footprints?" A few weeks after we came home from Hawaii, Khafri started preschool. Each student kept a weekly journal about what they did during the weekend. Khafri often drew about different activities our family did on the weekend. These journals were shown to parents about once a month. I use these journals to reflect and learn about how he represented our conversations and time together. Figure 2 is a page from Khafri's journal where he drew a volcano and two trees; a reflection of his thoughts and interactions with an arid landscape such as the volcanic site.

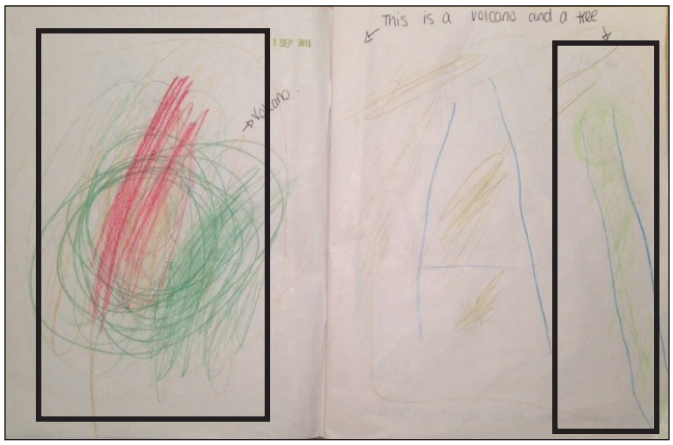


FIGURE 2: This is an example of his memory of our trip to Hawaii's volcanic landscape (box on the left). The tree is indicated by a box on the right.

These teachable moments led me to ask:

- What makes Khafri connect between two different landscapes and his experiences with different activities such as making footprints?
- What observations did Khafri make to help him notice and compare the different types of landscapes?
- How can I enhance and inform my teaching philosophies through observing his work and listening to his questions?

Rich and extensive observation and documentation of children's work is the core of the Reggio Emilia Approach to educating preschoolers because this allows teachers to understand the children better and to evaluate the teachers' own work, thus promoting professional growth, and facilitating communication and exchange of ideas among educators to make children aware that their effort is valued. Documentation helps to create an archive that traces the history of the school and of the pleasure and process of learning by many children and their teachers (Helm, Beneke and Steinheimer 1998, 6).

Children between the ages of three to six years old use symbolic thought to form mental images to allow them to form relationships and anticipate and remember objects, people and events. They mentally use symbols to represent each situation prior to advance development of language (Copple 2003). Children provided with many opportunities to relate and to act on people, objects and events develop internal control of thought and thus form relationships and connections between two different or similar ideas (Vygotsky 1966; Vygotsky 1978).

Educators who often examine and observe the learning processes of individual children will be able to make a change in their perspectives of teaching and planning. Reflecting on children's work informs educators to develop thoughtful approaches to curriculum development and become a more responsive educator (McCormick 2004). Critical reflection from children's behaviour and through their work both affects and shapes the educators' teaching philosophies and knowledge.

# Conclusion

As I conclude this paper, I have chosen to represent my reflections as ocean waves. Waves build on each other to shape the land around and under them. My waves of reflection continually build each other to shape my teaching practice and the relationship I have with my students and my son. My waves of reflection do not hit my shores of knowledge and practice. Instead it is a *becoming* process that is continual and perpetual to inform and shape my teaching practice.

Becoming a "reflective practitioner" (Schön 1983) is not a simple task, and the process is fluid and dynamic. Becoming reflective is a lifelong process, which evolves over time and requires continuous reflection and constant revisiting of events throughout an educator's career (Schowetter et al 2002). My waves of reflection through self, my peers, children and their work have encouraged me to re-evaluate my role and contributions as a science educator. Each wave, encounter and experience with teachers, students and the classroom as described in this paper represent a fluid thinking and rethinking of before, during and after. My realization to change how I teach science sparked from teaching my son about his immune system and this spark of curiosity and misalignment of my son's content knowledge, and his application of science started my journey into understanding the similarities and differences in teaching science as a scientist. It is important for the reader to note that my claim warrants an importance of scientific content toward an understanding of application, relevance and significance to oneself and to society. In addition to content knowledge, scientifically literate students who think about science from the cultural and societal perspective to inform and shape their worldviews have a deeper understanding and thus feel a greater responsibility for learning about science. As a scientist, my content knowledge and understanding of science is deep and as a science educator, I am beginning to acquire a deeper understanding of pedagogy, curriculum and practice. The reflections, experiences and encounters described in this paper are moments (among other numerous encounters) of creating the awareness of how teaching science in a laboratory and a classroom is different. However, as a scientist and science educator, I *do* and *teach* science to contribute to the development of scientifically literate students who think and do science responsibly. "The hope for a positive 'spill-over' effect from the learning of science [beyond content] to the improvement of society and culture" (Matthews 2009, 700) depends on how science is taught in the classroom, and much of it depends on the interactions and relationships formed between the educator and the students and the learning environment. The interactions and relationships can be shaped through reflection of one's teaching practice.

In his paper *The Idea of Nature* (1945), Oxford philosopher R G Collingwood wrote,

> A man who has never reflected on the principles of his work has not achieved a grown-up man's attitude towards it; a scientist who has never philosophized about his science can never be more than a second-hand, imitative, journeyman scientist. (p 2)

Each wave of reflection is supported through teaching and life experiences to bring critical thought to one's teaching practice and, ultimately, one's teaching philosophy.

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The Alberta Teachers' Association (ATA) requires consent to publish personal information about an individual. Personal information is defined as anything that identifies an individual in the context of the collection: for example, a photograph and/or captions, an audio or video file, and artwork.

Some schools obtain blanket consent under *FOIP*, the *Freedom of Information and Protection of Privacy Act*. However, the *Personal Information Protection Act* (*PIPA*) and *FOIP* are not interchangeable. They fulfill different legislative goals. *PIPA* is the private sector act that governs the Association's collection, use and disclosure of personal information.

If you can use the image or information to identify a person in context (for example, a specific school or a specific event), then it is personal information and you need consent to collect, use or disclose (publish) it.

Minors cannot provide consent and must have a parent or guardian sign a consent form. Consent forms must be provided to the Document Production editorial staff at Barnett House together with the personal information to be published.

Refer all questions regarding the ATA's collection, use and disclosure of personal information to the ATA privacy officer.

Notify the ATA privacy officer immediately of any incident that involves the loss of or unauthorized use or disclosure of personal information, by calling Barnett House at 780-447-9400 or 1-800-232-7208.

Maggie Shane, the ATA's privacy officer, is your resource for privacy compliance support.

780-447-9429 (direct)

780-699-9311 (cell, available any time)

## Consent for Collection, Use and Disclosure of Personal Information

Name: _____ (*Please print*)

☐ I am giving consent for myself.

☐ I am giving consent for my child/children or ward(s), identified below:

Name(s): _____ (*Please print*)

By signing below, I am consenting to The Alberta Teachers' Association collecting, using and disclosing personal information identifying me or my child/children or ward(s) in print and/or online publications and on websites available to the public, including social media. By way of example, personal information may include, but is not limited to, name, photographs, audio/video recordings, artwork, writings or quotations.

I understand that copies of digital publications may come to be housed on servers outside Canada.

I understand that I may vary or withdraw this consent at any time. I understand that the Association's privacy officer is available to answer any questions I may have regarding the collection, use and disclosure of these records. The privacy officer can be reached at 780-447-9429 or 1-800-232-7208.

Signed: _____

Print name: _____ Today's date: _____

For more information on the ATA's privacy policy, visit **www.teachers.ab.ca**.

The Alberta Teachers' Association

OP-DP-64 2021 03

# Council Notes

## Constitutional Objective

The objective of the Early Childhood Education Council of the Alberta Teachers' Association is to improve practice in early childhood education by increasing members' knowledge and understanding of this specialty.

## Membership

Total membership of the council is currently 2,444.

## Conference and Other Programs

The council organizes an annual conference for its members on early childhood education. Attendance at annual meetings over the last several years has averaged 600.

Several regional organizations of the council carry on programs for members in their areas. The council supports these regionals. It also occasionally offers workshops and other activities in areas where regionals have not been organized.

## Publications

The Early Childhood Education Council publishes a newsletter (*Issues, Events and Ideas)* and a journal (*Early Childhood Education).* Members of the council receive these publications as part of their membership. Nonmembers wishing to receive copies of these publications may obtain them by paying the subscription rate of $30 (Canadian funds) annually and writing to the Early Childhood Education Council, ATA, Barnett House, 11010 142 Street NW, Edmonton, AB T5N 2R1.

## Website

The council maintains an Internet site at www.ecec-ata.com.

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Personal information regarding any person named in this document is for the sole purpose of professional consultation between members of the Alberta Teachers' Association.

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