Emotionality and Learning Stories: Documenting How We Learn What We Feel

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Abstract

Based on a three-year research project in which outdoor and environmental education were embedded in classroom curricula, this paper considers learning story pedagogy and accompanying emotional elements often found in narratives. We draw on neuroscience research findings that support the importance of emotion in focusing attention and supporting memory. A detailed account of the E4E (Educating for Environment) university/school partnership project includes a description of the resulting documentation over three years. Comparison and analysis of the documentation are followed by four propositions for outdoor and environmental education practitioners' consideration.

Résumé

*Rédigé à partir d'un projet de recherche de trois ans portant sur l'intégration à des programmes scolaires de l'enseignement en plein air et de l'éducation à l'environnement, le présent article examine les récits pédagogiques et les éléments émotionnels souvent connexes en s'appuyant sur la recherche en neuroscience, qui étaye l'importance de l'émotion pour concentrer l'attention et stimuler la mémoire. La description détaillée du projet E4E (*Educating for Environment*), un partenariat entre les écoles et les universités, présente la documentation recueillie sur une période de trois ans. La comparaison et l'analyse des données seront suivies de quatre propositions à soumettre à l'examen des enseignants qui mettent en pratique l'enseignement en plein air et l'éducation à l'environnement.*

Keywords: learning story, emotion and learning, pedagogical documentation, outdoor education, environmental education, bodybrain, neuroscience of learning

Introduction

At the heart of our research lies the belief that outdoor and environmental education should be natural and embedded elements of all school curriculum; we have worked towards that end in a three-year university/school partnership project. Along the way we have made some inspiring discoveries, two of which we share in this writing. The first is the use of the learning story as an effective way to document outdoor and environmental education teaching and learning not only in the primary grades, where learning stories were first formalized (Carter, 2010), but in the junior and intermediate grades as well. The second discovery,

brought into focus by learning stories, is the compelling importance of emotion in the learning process.

This paper begins by examining learning story pedagogy and its emerging use in teacher practice, followed by an outline of the emotional elements often found in narratives. Then we review neuroscience research findings identifying the importance of emotion in focusing attention and supporting memory—both key aspects of the learning process. We provide an account of the E4E (Educating for Environment) university/school partnership project, with resulting documentation over three years. Our comparison and analysis of the documentation is followed by four propositions for consideration by outdoor and environmental education practitioners.

Situating Our Story in the Literature

There are two back-stories that require telling before we can make the connection between environmental education and emotion. The first traces the development of learning stories as a form of pedagogical documentation, connecting storytelling and the bodymind. The second story delves into neurochemicals and the bodybrain functions from which our emotions, and our learning, originate.

Learning Story's Roots

In post-World War II Italy, in the town of Reggio Emilia, a unique approach to early childhood education was launched under the leadership of Loris Malaguzzi (Hewett, 2001). This pedagogy recognizes that children are the architects of their own learning, and are considered "beautiful, powerful, competent, creative, curious and full of potential and ambitious desires" (Hewett, 2001, p. 96). The Reggio-inspired approach, considered to be innovative and child-centered, provides the foundation for rethinking the role of both teacher and learner (Hewett, 2001; Krechevsky, Mardell, Rivard, & Wilson, 2013; Richhart, Church, & Morrison, 2011; Turner & Wilson, 2010). Using project-based learning, the child is encouraged to explore, observe, question, and discuss with their peers and teachers. The teacher takes the positions of *provocateur* to move thinking forward, of guide who encourages exploration, and as collaborator and co-learner (Hewett, 2001). Because the Reggio approach promotes learning as a social-inquiry activity, children are encouraged to describe their thinking and teachers are required to become listeners and observers of their students' learning experiences (Carter, 2010).

Teachers engaging in Reggio-based pedagogy are required to collect rich data sets (observations) that chronicle their students' learning; data might include photos, videos, audio transcripts, student artifacts, and learning stories (Ontario Ministry of Education, 2012; Turner & Wilson, 2010; Wien, 2013). Teachers visually display these artifacts for their students and themselves to

share in reflection, analysis, and discussion of learning (Hewett, 2001; Wien, 2011). "Pedagogical documentation" refers to this process of data collection, display, and analysis, and has become a subject of interest within the education community (Wien, 2011). Viewed as an opportunity to include qualitative and formative data as a way to understand student learning, pedagogical documentation requires a shift in attitude (Carter, 2010; Turner & Wilson, 2010), prompting teachers to reposition themselves in relation to their students "to engage in this reinterpretation of what it means to be a teacher and learner" (Turner & Wilson, 2010, p. 6).

An outgrowth of pedagogical documentation is the use of learning stories, that is, narrative representations (in text and images) of learning that has occurred. With their roots in New Zealand's Maori oral traditions (Carter, 2010), learning stories might include a summary of the learning activity, new learnings, photos, images of students' artifacts, quotes, and teachers' observations and questions (Southcott, 2015). As teachers take on the task of compiling and creating the learning story as a way to understand the learning choices of their student (Reisman, 2011), they are enacting their own learning story as well.

Southcott (2015) writes that "the learning in learning stories is twofold: teachers come to understand how their own thinking is being shaped at the same time as they learn about children's thinking. It becomes a learning story nested within a learning story" (p. 35). As stated by Wien (2011) and Woodhouse (2011), learning stories as narratives suggest a storyline, a plot, and a relationality, rather than the straightforward transmission of information from teacher to student. The learning story must provide rich and interconnected data that will lead to reflection and further discussion. A learning story should be a display that can be viewed, analyzed, and theorized, and potentially elicit emotional responses. Intentional and focused learning story discussions between teachers and students are invaluable in revealing the thinking/learning process of the student (Wien, 2011; Woodhouse, 2011), providing formative assessment of student progress (Reisman, 2011), informing the role of the teacher in the learning process (Pride, 2014), identifying emotional responses to learning (Carter, 2010), and strengthening relationships between teacher and student (ibid).

It is a common misconception that learning stories are only useful in the early years of education, since most research and writing has been done at that level. However, there is increasing interest in using learning stories in higher grades, as illustrated by the following examples: Pride (2014) documents the use of learning stories to understand giftedness in a high school science program, Picken (2012) describes development of Year 9 social studies conceptual understanding, and Wai Kei Li (2014) explores post-secondary students' English learning experiences and identity construction. Learning stories used in higher grades offer different opportunities for students and teachers to consider and document learning—an area that would benefit from further research.

Lastly, it would be inaccurate to present learning stories without acknowledging criticisms of the pedagogy. In his critique of the use of learning stories for

purposes of assessment, Blaiklock (2008) identifies as problematic the subjective nature of learning stories as constructed by teachers based on minimal data. He also questions whether learning stories take focus away from the development and assessment of knowledge and skills. Blaiklock's commentary should serve to remind that learning stories are complementary to other assessment forms, and not intended to replace them. Additionally, concern has been expressed over the ethics of using photos of students in public displays (Tarr, 2011). The importance of informed (parental) consent cannot be overstated in this regard, and the practice of taking photos that capture learning but do not necessarily identify individual children should be considered.

The Emotionality of Stories

Stories can offer a glimpse of the emotions that underlie learning. Carter (2010) urges teachers to seek perspectives beyond the checklist of a student's learning skills, and respond to the child as a person. In the second of five steps to creating learning stories, Carter advocates for a humanistic approach: "Describe what the child does and says from your perspective as someone who cares and is listening closely to discover what is happening….[Be] present with your heart" (p. 41).

Krechevsky et. al. (2013) also recognize the potential emotionality of the learning story process: "The selection of what to share often entails emotional considerations; for example, whether one wants viewers to experience wonder, surprise, or other feelings" (p. 59). Woodhouse (2011) makes a strong case for the importance of storytelling as a means to connect with students at a deeper personal level, claiming that storytelling humanizes teaching:

> Feelings, hopes, and desires comprise the deep emotional currents from which spring sensory awareness and the intellectual capacity to utilize ideas.…[W]e need to connect the ideas we teach to the flowing stream of emotions at the core of our students' experience in order for them to appreciate their meaning. (p. 217)

Jickling (2009) delves into the relationship between emotion, the bodily senses, and the stories that we tell to describe our lives and our learning. He reflects on his experience of a trip in Canada's north, paddling a northern river in the presence of wildfires, and wandering the forest and mountain paths. As city life fades, he recognizes the landscape with a "know-it-in-your-bones kind of knowledge" (p. 166), giving credence to the connection between the sensuous experiences of the body and emotion:

> First, at its very core, the learning experience was felt—understood in a bodily and sensuous way. In the end it was also an emotional learning experience. It cannot be disproved or falsified. It just was. .... [T]he telling of this story resists separations of mind and body, and mind and landscape. (p. 167)

However, Jickling does not suggest that we abandon logical and rational ways of knowing (such as scientific research or logical reasoning); emotional understanding alone is not enough to understand the world. Rather, he suggests that "experiential-emotional understanding adds flesh and life to the bones so often polished smooth and white by analytical thought" (p. 168).

Quite possibly this is why learning stories are so compelling for educators —they tap into the intuitive notion that learning is a marvellous and complex human experience comprising multiple facets of the learner: the rational, the emotional, and the sensory. These are the elements of the bodybrain connection.

The Neurochemistry of Emotion

Sophisticated technologies are allowing neuroscientists to confirm what many educators have always intuited: the mind is not separate from the body—they are two sides of a single coin. Learning happens when our minds are in step with our bodies; we build our understanding from multiple sensory inputs, not only our cognitive inputs. In a summary of how brain research might impact the work of teachers, McGeehan (2001) presents three key findings: "1) emotion is the gatekeeper to learning; 2) intelligence is a function of experience; and 3) the brain stores most effectively what is meaningful from the learner's perspective" (p. 8). The first of those findings is of particular interest here.

The work of Pert (1997), detailed in her book *Molecules of Emotion: Why You Feel the Way You Feel*, was groundbreaking with regard to the bodybrain connection. Pert showed that neural communications occurred not only in the brain but throughout the body; she redefines the body as "the unconscious mind" (p. 114). Neural communication is accomplished by a host of brain molecules (peptides, hormones, protein ligands, etc.) that move much further than the closest neural synapse, out through the extracellular fluids, to target receptors throughout the body. Neuropeptides are linked to our five senses, which are inextricably linked to emotions such as fear, pleasure, and pain. "Think of the brain as a machine for not merely filtering and storing this sensory input but for associating it with other events or stimuli occurring simultaneously at any synapse or receptor along the way—that is, learning" (Pert, 1997, p. 142). Thus, we do in fact "think" and "learn" with our bodies.

Both Pert (1997) and Sylvester (1995) stress the importance of emotion in learning because it focuses attention and underpins memory. Sylvester (1995) asserts that: "Emotion and attention are the principal preliminary processes that our body/brain uses in its efforts to survive (and even thrive) in the face of continual challenges" (p. 71). The stronger the emotions and the more sensory inputs associated with a learning event, the more powerful and long-term the memory will be (Cahill & McGaugh, 1995; Talmi et al., 2008). Thereby, through our senses, emotion is linked to learning. Every learning experience is accompanied by emotion, whether it is acknowledged or not; our emotional responses guide our decisions (conscious or subconscious) regarding what to remember

and what to forget. Positive emotions that elicit a sense of well-being, such as happiness, seem to support broader attention focusing and cognition, whereas emotions such as anger or frustration tend to decrease cognition (Fredrickson & Branigan, 2005). During focused attention, the bodybrain becomes more alert to sensory inputs, such that emotion and attention seem to work together to establish memory (Talmi et al., 2008).

Unfortunately, emotion is not comfortably embedded in curricula (Sylvester, 1995), nor does it lend itself to current requirements for assessment and accountability. As Sylvester points out: "By separating emotion from logic and reason in the classroom, we've simplified school management and evaluation" (p. 75). But in so doing, we effectively handicap the complex and powerful bodybrain through which lasting learning occurs. Perhaps this is the legacy of Western dualism, with its positive/negative, good/evil contrasts: to separate the mind from the body, to value rationality above emotion. Themes of separation seem to pervade education, particularly in the higher grades where intellect is prized in the separated disciplines. Possibly then, a learning story, with its basis in sensory experience eliciting a range of emotions (all of which impact learning), recounting what has been remembered/learned by the brain as well as the body can serve to reunite emotion with rationality in the classroom.

The E4E Story

We came to our understandings of learning stories through an outdoor and environmental education research project titled E4E (Educating for Environment), in which we partnered with our local public school board to plan and deliver outdoor and environmental education teaching and learning in local schools.

The E4E Project

We believe that outdoor and environmental education in formal schooling should not be consigned to one event, such as a field trip, since this conveys the impression of an optional add-on to the curriculum. One of the intentions of the E4E project was to work with the most recent Ontario Ministry of Education policies/documents, which position outdoor and environmental education as an integral component of formal curriculum in all grades and subject areas (Ontario Ministry of Education, 2007, 2009). The E4E project aimed to facilitate and explore a collaboration that would embed outdoor and environmental education within regular school curricula over more than one day, with an emphasis on outdoor, inquiry-based learning. Our work with learning stories and the emotionality of outdoor and environmental education, which we report on here, were only two aspects of the larger project.

Each year for three years, during the month of May (2013-2015), we hired four newly minted teachers from our School of Education, who had some

interest and experience with outdoor and environmental education, to work as facilitators in the E4E project. Our local school board liaison opened discussion with interested staff at one K-8 school each year. Teachers from the selected school met with E4E facilitators to collaborate on ideas that would bring a focus to outdoor and environmental issues without straying too far from the curricular topics that needed to be "covered." Throughout the month facilitators visited the classrooms to meet and co-develop multi-day lessons with the teachers, develop relationships with the students, and offer outdoor and environmental education learning opportunities in partnership with the teachers. Each class made at least one trip to the university, where facilitators provided an array of learning opportunities, both indoors and out.[1] At the end of the month, the learning that had taken place within each class of students was shared in a "Celebration of Learning" school assembly. With direction from the researchers, a final report was created by the facilitators.

However, to assume that each of the three years was essentially the same experience for all would be erroneous. Over the three years, our partnership with each of the schools' teachers and students shed new light on our evolving understanding of documentation and the emotionality we encountered. Our personal insights into the strength and utility of learning stories became transformative over those years. Following is a brief description of each of the three schools' E4E projects, with particular attention given to the elements that demonstrate our evolving appreciation and proficiency with learning stories and their potential to document emotion.

Year 1: E4E at Two Rivers School.[2] Two Rivers School is a rural K-8 school (approximately 130 students) in a small community considered economically depressed due to the decline of the logging industry in northern Ontario. The teacher complement is largely transient, leading to a wavering sense of "school community" or social capital (Steele & Scott, 2014). Two Rivers School was chosen to participate in the first E4E iteration to support the school as a community.

In that first year, rather than working closely with the teachers to embed environmental education in ongoing learning, and faced with a number of organizational obstacles (discussed in more detail in Steele & Scott, 2014), the facilitators provided outdoor and environmental education activities that were, in many cases, extraneous to the curriculum. In our view this was a default to a traditional outdoor and environmental education delivery; unfortunately, the notion that environmental education could and should be integral to the curriculum was not borne out as well as we had hoped. And although we had had conversations about innovative approaches to pedagogical documentation, the final report prepared by our facilitators (under our guidance) reflected a traditional delivery of outdoor and environmental education. Remaining well within our comfort zone, we encouraged our facilitators to report the learning activities that they had developed in a recognizable, teacher-focused resource document. Figure 1 is an excerpt detailing an activity presented to primary-level students.

While the document provides detailed information on how to prepare and teach the lesson, it does not provide information on how well the students performed the activity or how they felt about it.

Environmental Artist

Grade: Kindergarten - Early Learning, 1, 2, and 3

Objective: Explore and discover different patterns, shapes and textures in the environment.

Subjects: Science, Visual Art

Location: Outdoors, Indoors

Resources and Materials: Paper, Paint in Pie Plates

Time: 20 minutes outside; 30 minutes inside

Begin this experience with: Does nature contain or create art? What are some of the different types of patterns, shapes and textures? Can we use pieces of nature to create art?

Part A: Outdoors - Collecting Objects

Allow students to explore a predetermined area outside, and collect items found in nature.

Ensure students have collected a variety of items (sticks, leaves, pine needles, rocks, flowers, etc.).

Part B: Classroom - Creating Art Pieces

Students will sit with their own piece of paper or in groups, and dab their piece of nature in the paint.

Students will make a print of the object on their paper.

Students can try other objects with different colours.

Reflection Questions

What objects made smooth prints?

What objects made bumpy ones?

Taking it Further: Tree Rubbings

Objective: Explore and discover different patterns, shapes and textures in the environment, using different methods to show these patterns.
Subject: Science, Visual Arts
Location: Outdoors in a Wooded Location
Resources and Materials: Paper, Crayons

After exploring their environment looking for different textures, students will place their paper flat on a tree trunk. Students will then run their crayons back and forth quickly on the paper, making a rubbing of the pattern underneath. Have students try out different objects, for example a leaf or a rock.

Expectations (Early Learning - Kindergarten Ontario Documents)
Science:

Demonstrate an awareness of local natural habitats through exploration and observation

Demonstrate and awareness of the natural and human-made environment through hands-on investigations, observations, questioning, and sharing of their findings.

Sort and classify groups of living and non-living things in their own way

Participants in envionementally friendly activities in the classroom and the school yard

Visual Arts:

Explore a variey of tools, materials, and processes of their own choice to create visual art forms in familiar and new way

Figure 1. Excerpt from a Year 1 report

It would be unfair to participants to leave unacknowledged the many moments of wonder and excitement experienced as we/they wandered through the forest on exploratory hikes, practiced orienteering skills, and built "beaver" dams. However, in reviewing the evidence provided by the final report, we realized that none of the emotions experienced by the students, teachers, or facilitators had been captured. As leaders of the project, we felt a certain dissatisfaction that we had not succeeded in our intentions, neither in embedding outdoor and environmental education in the "regular" curriculum nor in adequately documenting the learning that had taken place. We recognize now that we were lacking in an understanding of documentation; we needed to develop skills in the learning story process.

Year 2: E4E at Creekside School. In the second year of the E4E project we partnered with Creekside School, again a small rural K-8 school (approximately 90 students) in a tiny hamlet, to which almost all students were bussed. Similar to Two Rivers School, the catchment area of Creekside School is also considered economically depressed, but Creekside School had a more permanent and coherent teaching staff that, despite their out-of-town location, were well-informed and progressive in their pedagogies, and very pleased to be collaborating with us.

As one might expect, their transparent and supportive approach was key to a facilitator/teacher collaboration that resulted in multiple outdoor and environmental education student learning opportunities embedded in the daily curriculum, as opposed to moulding the curriculum to fit with the activity. Moreover, we (facilitators and researchers) benefited from the expertise in pedagogical documentation of the Early Learning Kindergarten teacher in the school. Always armed with an iPad, her practice was to record, through photos and videos, the activities and thinking of her students. The data she collected was then used in various ways: (a) to display/replay the images to her students as a way to generate and focus discussions about their learning; (b) for purposes of individual student assessment; and, (c) to share with parents to demonstrate their child's learning. As stated earlier, these are among the fundamental elements of learning stories, and having their use modeled with proficiency provided the impetus for our first attempt at writing our own learning stories. Together with our facilitators, we created the final document for the Creekside School project, and it demonstrates a significant departure from the traditional resource format of the first document.

Figure 2 is an excerpt from the second document; it illustrates the move towards a focus on student/teacher narratives. Implicit in the listing of activities is the assumption that the reader/educator is able to construct similar learning opportunities for their own students without detailed lesson plans. Rather than a "how-to" manual, the document created in our second year *tells* the stories, in text and pictures, of the learning that took place; it presents the teaching and learning, but with emphasis on the outcomes. Again, as we looked back, despite the obvious emotional reactions of participants during their outdoor and

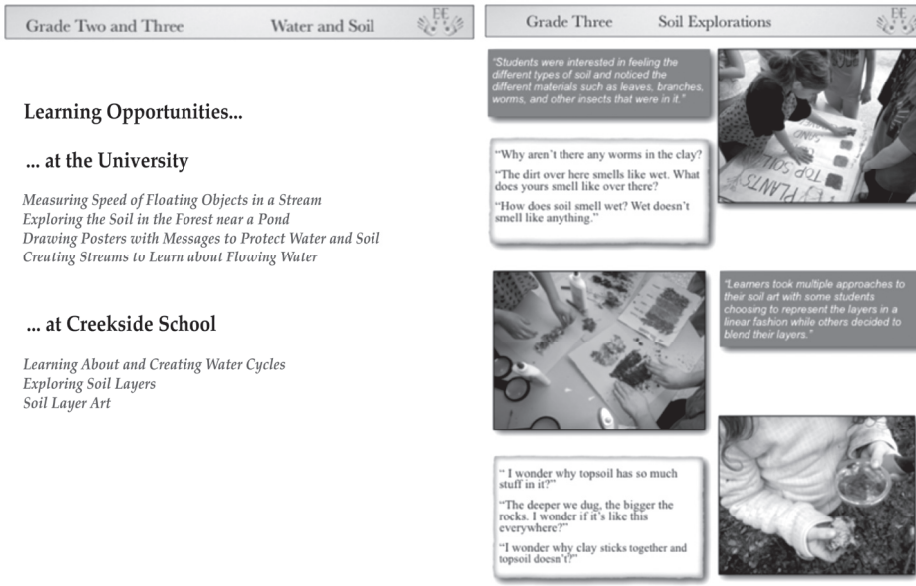

Figure 2. Excerpt from a Year 2 report, outlining learning opportunities

environmental education activities throughout the month, the emotionality of their learning was still not captured by our learning stories. Although we were very pleased with the direction of the project overall, and with our first formal foray into documenting our work through learning stories, we knew there was more to be explored.

Year 3: E4E at Sunnyside School. The third year of the E4E school project found us at Sunnyside School, a K-6 school on the edge of town. Because quite a few teachers were already addressing elements of environmental education in their programs, it was felt that the E4E project would enhance this pedagogical direction; indeed the teachers were happy to enter into the collaboration. At Sunnyside School we worked with only Grades 3-6, constituting four classes totalling approximately 100 students.

In this third iteration of the project, the onus for pedagogical documentation fell to us (facilitators and researchers), since none of the four teachers had used this data collection strategy. Certainly our previous two years had taught us a great deal about the creation and use of learning stories, and it was in our third year that we felt a certain confidence in this documentation strategy. During the introduction of the project the facilitators were introduced to the concept of learning stories, the collection of data, how to analyze, and finally how to display the story. Throughout the month, facilitators were encouraged and supported

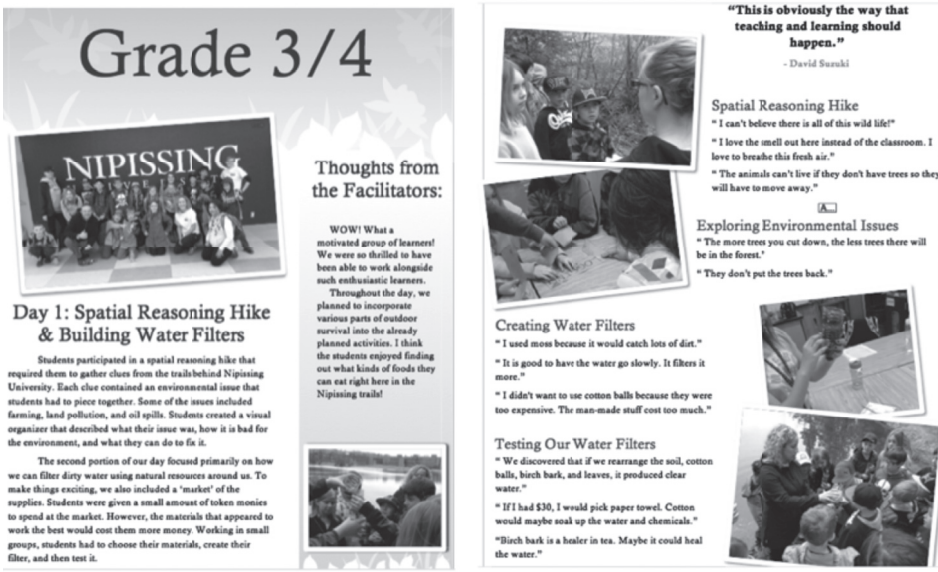

Figure 3. Excerpt from a Year 3 report: A sample learning story

in having a camera or iPad always at hand to observe and record the students' learning moments. This request was met with some resistance, not because the facilitators did not believe this form of documentation to be a useful strategy, but because it was new to them. And it was another task to contend with, in addition to designing and implementing activities. However, we had come to understand that to simultaneously fill the roles of both facilitator/teacher and observer/recorder was a tall order, and its mastery required patient persistence; the dual focus demands concentration and mindfulness. Our role was to continue to remind them and encourage the development of those skills.

The facilitators were tasked with reviewing all of the photos and videos collected, transcribing conversations, and reflecting on their experiences as educators. With guidance and editing from us, they created their own learning stories, which formed the basis of the reporting document for the E4E project at Sunnyside School. Figure 3 is a sample learning story from the compiled document.

As the sample demonstrates, the learning activities are briefly outlined, with the facilitators sharing their thoughts on the time spent with students. Photos and quotes focus on the inquiries undertaken by students, and record the salient thinking during the activities. Without prompting, the facilitators make reference to the emotional responses of both the students and themselves. This was a departure from the prior two reports, tapping the potential of learning stories to document the emotionality of learning and make room for both affective and cognitive representations of learning.

Analysis and Discussion

There are layers of discovery, acquisition of knowledge and skills, and emotional responses embedded in the three years of the E4E projects—learning stories nested within learning stories. The children in the classrooms, their teachers, the facilitators, and we ourselves have all created our own internal narratives of what was experienced, felt, and held in memory. The memories are different and the same; the learning goes down many pathways, some parallel and others unique; the sensory and sensuous memories rouse a myriad of feelings and emotions. We could not possibly hope to capture the entirety of that rich and diverse teaching, learning, and feeling. By way of final reports, we are confined to offering only a glimpse of what actually transpired, hoping that readers find moments of resonance as they ponder the stories.

As demonstrated by Figures 1, 2, and 3, for each year of the E4E project a final document was created as a summary of learning as we observed it. We recognize that since all but two of the facilitators were different in each year of the project, any changes in the structure and content of final documents are a reflection of our influence on, and work with, the facilitators. In a sense, the final documents encapsulate our learning, as project leaders, about learning stories and emotions over three years.

Comparative Analysis of the Data from Three Documents

Pedagogical documentation can be simultaneously considered a form of pedagogy and a research method in the ethnographic tradition (Wien, 2011). Data is collected by the teacher researcher in the form of text and pictorial representations, called "field texts" by Clandinin and Connelly (1998). The teacher/researcher then decides which observations provide the richest description (Denzin, 1994) to create a montage (Denzin & Lincoln, 2000) that tells the story of the students' learning, and that is suitable for further discussion and analysis (Wien, 2011).

As a way to make sense of the evolution in our understanding of documentation of learning, and how emotionality is connected to learning, we chose to view the final reports as evidence or data. To that end, in order to aid in analysis of the reports, we identified what the literature indicated are key characteristics of learning stories. Based on the various descriptions of learning stories, their genesis, and their literary and visual structures, we established the following criteria:

(a) the *intention* of the learning story is to document learning and to elicit further discussion (Hewett, 2001; Wien, 2011);

(b) the learning story is constructed of data including *photos, videos, audio transcripts, student artifacts* and *activity summaries* (Ontario Ministry of Education, 2012; Turner & Wilson, 2010; Wien, 2013);

(c) learning stories should be *displayable,* akin to a poster—with attention

paid to *visual elements* such as focal points, readability, white space, use of colour, etc. (Wien, 2011), and

(d) learning stories should provide evidence of *emotional responses*, and also elicit emotional responses during subsequent discussion (Wien, 2011).

Figures 1, 2, and 3 were chosen as samples of learning stories created over the three-year project because (a) they are suitable representations of each of the documents from which they were taken, and (b) for the purpose of comparison, they all address the activities undertaken at the primary grade level. We applied the criteria for learning stories to the Figures from each year; our analysis is presented in Table 1.

Table 1 *Comparison of Final Reports*

	Intention	**Forms of Data**	**Visual Elements**	**Evidence of Emotional Response(s)**
Year 1	Detailed lesson plan to enable reproduction by providing instructions and additional resources	Lesson plan format: objectives, grade level, resources, time management, and instructions for activities	Black text in boxes, no photos, crowded on to one page to create a "lesson-at-a-glance." The format is akin to a number of respected outdoor and environmental education activity resources, such as *Environmental Education in the Schools* (Braus & Wood, 1993), and *Project Wild: K-12 Curriculum & Activity Guide* (Project WILD & Council for Environmental Education, 2004)	No evidence of learning or of emotions
Year 2	Learning story format with the intention of displaying student learning	Activities are titled and partially summarized; quotes (taken from audio transcripts and notes); photos (of activities and artifacts) support the text	Two-page spread per grade; colourful text and significant white space; colour photos. Blue boxes display student quotes; green boxes denote facilitators' comments	Photos hint at wonder and curiosity among students, but emotions are not mentioned in text. Quotes are of a thinking/knowledge acquisition/inquiry nature
Year 3	Learning story format with the intention of displaying student learning and facilitator responses to learning	Activities are summarized in narrative form; student quotes (from audio transcripts) and supporting photos (of activities and artifacts) are organized by activity; facilitators' comments are included	Two-page spread per grade: colourful text and photos; less white space than in Year 2; visual interest through placement and background graphics	Emotional reactions are evident in student quotes and facilitator comments. "*Wow! … thrilled…*"; "*I love…*".

Analysis Summary

Over a three-year period, the final reports demonstrate an evolution of our valuing and thinking about what is useful and important in the documentation of learning. What began as a black-and-white lesson plan with utility for teachers morphed into a colourful narrative/photo presentation that is useful in engendering further conversations among students, teachers, and facilitators; we came to appreciate the importance of attending to the learning moments and the emotions that spurred them. This transformation in our thinking is mirrored in what we perceive as a blossoming of the accompanying reports over three years. The focus of the report changes from a resource targeting teachers to a report wherein all participants in the experience are included. The colourful, visually interesting pages draw the reader into the learning experiences; the voices give the reader insights into the nature of the learning, and emotions are valued and presented as part of the learning experience. In short, the reporting document has evolved from lesson plans into learning stories.

We asked ourselves: how well do the learning stories presented in our third-year document measure up to their identified and agreed-upon characteristics? In line with Southcott's (2015) criteria, our third-year learning story summarizes the learning experiences of the students through their quotes and photos, as well as teachers' comments and observations, although teacher questions are lacking, as are actual student artifacts. The facilitator narratives in our document suggest a "storyline" of activities, as the facilitators developed relationships (Wien, 2011; Woodhouse, 2011) with both the students and their teachers at Sunnyside School. Wien's (2011) requirement that the learning story be displayable and in a visually pleasing and informative format is met. The pages of the document can stand alone as interesting and informative posters for display and discussion. Lastly, the stories accomplish Wien's (2011) call for emotionality. We see this as a crucial point: it is not remarkable on its own that the student said, "I love to breathe this fresh air" (though we are delighted that they did), and many students voiced similar emotional responses to their E4E experiences. The importance lies in valuing the statement as a pivotal learning element, and therefore including it in the report. The document page demonstrates emotional responses from both the students during the learning experiences and the facilitators as they reflected on their work; missing is data that captures the emotional responses of other readers/discussants of the document.

We realize that our documentation of learning still has some gaps, and there is yet room for a richer narrative. Indeed, we wonder about the ability and utility of having students, rather than their teachers, creating their own learning stories. With instruction, facilitation, and practice, students could provide a valuable documentation of their learning that would inform both themselves and their teachers.

As with many innovative ideas in pedagogy, a cautionary note is in order. We asked ourselves, "Do learning stories really tell the whole story?" and, "Do

teachers really have time to carefully and mindfully attend to individual students to document and create learning stories for, and with, them?" The answer to both questions is "probably not." As Jickling (2009) points out, narrative provides depth and detail to traditional forms of documentation and assessment; in other words, learning stories are complementary in creating a detailed picture of student learning. Unfortunately, despite the benefits they bring to assessment, our experience is that learning stories are currently under-utilized in both classrooms and outdoor and environmental education. Numerous accounts of teacher work, as well as our own experiences in both outdoor and environmental education and the classroom, suggest that learning story pedagogy will be seen as cumbersome and time-consuming, offering a questionable (qualitative rather than quantitative) outcome. Professional development and special project opportunities such as the E4E school projects are ideal venues for educators to explore how they might put learning stories to good use with their students.

Lastly, it is important to recognize that not all of the emotions elicited during the E4E learning experiences were positive. Certainly, there were moments when the rain and wind became chilling, the quiet sit-spot was uncomfortable, and mosquitoes had to be swatted. For some students, these circumstances create anxiety or discomfort that detracts from the learning experience. Unpleasant emotions were not captured in the documentation, but perhaps should be addressed as they are as significant as positive emotions in the learning process (Fredrickson & Branigan, 2005).

Conclusion

Our work in the E4E school projects has been a wonderful three-year learning journey, during which time our thinking about documenting outdoor and environmental education has seen considerable transformation. Moreover, as we consider the emotionality inherent in outdoor and environmental education, it is appropriate to acknowledge the emotions that accompanied and drove our work. Were we to write our own learning story of the project, we would no doubt, through our text and photos, embed emotions like: *joy*, at joining Kindergarten students as they explored textures in nature; *discontent* over our initial inability to understand and utilize pedagogical documentation; *tension and anxiety* as the logistics and human elements of the project presented difficulties; and perhaps *pride* in the third year, when many of the goals for the project, including the creation of rich learning stories, were realized. We understand that these emotions, and many others, were an integral part of our learning journey – emotions without which we would not have moved forward.

Thus, based in our learning experiences as project leaders, we offer the following four propositions for consideration for those undertaking outdoor and environmental education activities:

(a) *The learning story approach to pedagogy and assessment is ideally suited*

to demonstrating the strong connections between emotions and learning. The emotions associated with learning are cumbersome to include in assessment strategies commonly used by educators, such as tests and checklists. Jickling (2009) advocates for "learning that is embodied, emotional, personal and that doesn't fit into traditional evaluation schemes" (p. 170); we believe that learning stories have the capacity to document "embodied, emotional, personal" learning.

(b) *The learning story approach takes time, practice, and commitment*. Educators know the value of all three requisite elements for internalizing particular knowledges and skill sets. After three years in the E4E project, we continue to see possibilities for improvement in the construction and use of learning stories.

(c) *Knowledge acquisition and emotional responses are a package deal*. Emotions do not stand in the way of learning but strengthen and support it; this is consistently confirmed through outdoor and environmental education experiences, and corroborated by the neurosciences. We need to value emotions, ranging from joy and wonder to frustration and sadness, as integral parts of the teaching and learning package.

(d) *Outdoor and environmental education educators need to take the perspective that they should assist learners to navigate their emotional responses as a way of supporting learning and teaching*. Traditional education approaches place educators in the role of directing students to navigate the construction of their cognitive knowledge and its application. We need to include the perspective that educators must attend to student emotion as a critical element required for learning. Educators must become aware of the importance of emotion in focusing attention and establishing memory.

As researchers, we see a number of directions that our work with the emotionality of learning stories might take us: prioritizing emotion over cognition in learning stories, analyzing the emotionality intrinsic to discussions between students and teachers as they reflect on their learning stories, and exploring the utility of learning stories as methods of assessment.

We began this paper by declaring that "at the heart of our research lies the belief that outdoor and environmental education should be natural and embedded elements of all school curricula." This remains entirely true, but we realize that we must recognize the profound influence of emotions on learning, particularly the sensuous and sensory experiences particular to outdoor and environmental education. As outdoor and environmental educators, our pedagogies can be enriched and strengthened as we acknowledge the emotionality inherent in learning experiences, both for our students and for ourselves.

Notes

1 Over the three years, a wide variety of outdoor and environmental education learning opportunities were designed and implemented by the E4E facilitators and teachers, but it is not within the purview of this paper to describe these in

detail. Rather, to give a sense of the activities, we briefly describe "Building a Beaver Dam," undertaken by Grade 5-6 students: After visiting and observing an actual beaver dam and lodge, the students were taken to a nearby stream and tasked with building an effective dam, using only nearby natural materials. They explored how twigs, branches, leaves, and mud might be positioned to hold back the stream, and in so doing, became aware of the tremendous skill of beavers at work. The activity was followed up by discussion, writing, and drawing.

2 All schools have been given pseudonyms.

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