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Formative Space: Literacy Practices in 21st Century Curriculum Making

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A thesis submitted in partial fulfillment of the requirements for the Doctor of Philosophy degree in Education

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Abstract

Partnerships for 21st Century learning support curricular reforms for global, cross-disciplinary competencies that will leverage and benefit education technologies. However, this research partnership with a literacy program developer occasioned an opportunity to study curriculum making in the 21st century that did not make assumptions about technologies and competencies. The integrated thesis based on this project pushes boundaries on how assessment and curriculum making are conceptualized by exploring broader questions of inquiry and participation through literacy and assessment practices in six junior elementary classrooms in Ontario, Canada, over a two-year period. Chapter 1 provides the background and purpose of the study in inviting teachers to re-design the literacy program with the students and pedagogical resources in their classrooms. Chapter 2 details the methodology of video inquiry, making contributions to narrative, collaborative, multimodal, and sociomaterial approaches to researching practice. Chapter 3 explores the participation of space, time, and material in curriculum making through the concept of spatial topology. Chapter 4 extends this consideration of relational space to literacy and assessment practices. This paper challenges and adds complexity to the discourse on 21st Century learning regarding cross-disciplinary competencies, by showing how closed and open questions in assessment and literacy practices perform disciplinary spaces for making meaning. While Chapters 3 and 4 focus more on intentionality and materiality in curricular design and enactment, Chapter 5 studies the immateriality of affect in curriculum making, and how agencies of the unintended effect emergent practices. The integrated work has implications for curriculum makers to attend to and participate with more than human actors in practices of curriculum making, and the role of inquiry and improvisation in making space for disciplinary practices.

Keywords

Literacy, Assessment, Curriculum, Pedagogy, Practice, Sociomaterial, Video inquiry, Narrative inquiry, 21st Century learning, Google, Elementary education

Summary for Lay Audience

How is learning practiced in elementary education in the 21st century? What forms of assessment and literacies are needed? What participates in curriculum making? These are questions about practice, inquiry, and participation that explore the agency of human and more than human actors in learning through a study of curriculum making in the 21st century. The context for the study was an invitation to educators to re-design the lesson materials and assessment practices in a literacy program. This thesis is the result of work with six, junior elementary classrooms in Ontario, Canada. In order to participate collaboratively in these classrooms, the research was designed to be open-ended and respond to different literature as needed. For this reason, Chapters 3, 4, 5 can be read in more of a “choose your own adventure” style, both topically and theoretically. If you want to learn more about sociomaterial notions of practice, turn to Chapter 3, “Seeing Double,” to see the limits to human agency in curriculum making. This chapter also takes a second look at empathy, “one of those things we’re supposed to be teaching you to be good at” (teacher participant) in the 21st Century Learning narrative. If you are interested in any or all of the following: formative assessment, literacy education, or cross-disciplinary learning, skip ahead to Chapter 4, “Assessment in 21st Century Learning.” Here you will find theories from sociomaterial and posthuman orientations that may challenge the boundaries of these topics when you see them as boundary-making. If you are interested in affect, embodiment, or complexity thinking, you will find ideas to play with in Chapter 5. And if you are hoping to learn more about technology in 21st Century education, this chapter considers how to tend to the “Magic and Monsters” made in practices with Google, contributing a more complex understanding of collaborative learning. Integrating (embodying) this research, the chapters in the thesis can also be read chronologically to tell my story as a researcher using narrative and video inquiries for studying multimodality and sociomateriality in literacy curriculum making, with implications for understanding the entanglement of inquiry with practice.

Co-Authorship Statement

I am responsible for the conceptualization and writing of all chapters in this thesis. Overall 95% of the literature review and the writing is mine. Chapter 2 (Ott, 2020) is an individual methodological contribution based on my work developing video inquiry. However, this program of doctoral research takes place within a broader research study initiated by Dr. Kathy Hibbert with multiple research partners from different institutions. As lead research assistant at Western on this project, I was responsible for updating the ethics application and letters of information and consent following the first study, applying to research in two school boards, recruitment of participants, coordinating the work of other research assistants, and leading data analysis through video inquiry in Chapter 3 (Ott, MacAlpine, & Hibbert, 2018). The participation of Kelly-Anne and Kathy in the data analysis is acknowledged throughout this chapter, but I would like to recognize here Kathy's contribution to writing part of the conclusion. Dr. Hibbert has continued to contribute through her roles as supervisor and principal investigator by providing guiding comments, questions and revisions to Chapter 4 (Ott & Hibbert, 2020) and Chapter 5 (Ott et al., forthcoming). My committee member, Dr. Rachel Heydon, and collaborator, Jenny Kassen, contributed key concepts about monsters to Chapter 5 (Ott et al., forthcoming).

Acknowledgments

I acknowledge, with gratitude and responsibility, that “I” am the result of relationships, and one of the most significant is to this place and all its peoples. My relations of privilege as a settler in London and student at Western University are enacted on traditional lands and through treaty relations with the Anishinaabek, Haudenosaunee, Lūnaapéewak and Attawandaron peoples. I acknowledge historical and ongoing injustices that Indigenous Peoples endure in Canada and accept responsibility as a public educator toward correcting miseducation and renewing respectful relationships with Indigenous communities through my teaching, research and community service.

I further acknowledge that this study was made possible through a Canadian Social Sciences and Humanities Research Council (SSHRC) Partnership Development Grant, and also supported by a Joseph Armand Bombardier Canada Doctoral Scholarship. I am deeply grateful to our partners in this work: QWILL Media and Education, Lois Burdett, members of the researcher team, and the teachers and students who participated in this study. You were all so generous with your time, resources, and insights.

Some of my relations – the most precious to me – are the result of being seen, valued, nurtured, loved. I am here through the loving support of my husband, Dr. Michael Ott, and our children, Cate and Ally. Thank you for making time and space so that I may share with others some of the things you give and teach to me.

To my mother, Dr. Marjorie Cooper, thank you for all you’ve done to help me “notice noticing.” My research in education would never have begun without your loving persistence calling me into the practice. To teachers, friends and colleagues in the Faculty of Education: Rachel, Jill, Jess, Kelly, Mel, Lin, Yin, Amber, Jenny, Naj – what great fun and privilege it has been to learn with and from all of you.

To my supervisor, Dr. Kathy Hibbert, your ability to realize potential in others is something I strive to emulate. Thanks to you, I have a much stronger understanding of how and why this matters. The opportunities you have given me to teach and to research are far more joy than struggle. Thank you for mentoring me. I hope you always will.

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Chapter 1

1 Introduction: Stories in Practice

“There is nothing as theoretical as a good story” (Arthur Bochner, 1997, p. 435).

Initiatives for 21st Century learning call for innovative educational models to foster the digital literacies and participatory culture that are the hallmarks of modern competencies. The challenge lies in how to assess these new forms of learning – they have many moving parts. My program of study asks how assessment can support 21st Century learning by leveraging the ubiquity of video technology to provide both students and teachers with multimodal evidence and participatory forms of feedback. When I was an elementary teacher, I provided visual materials to support my students’ reading. But it wasn’t until I started paying attention to what they were learning through the images, not just the print, that my understanding of their strengths and next steps was enhanced. The methodology of video inquiry I developed in my master’s research was exploratory work developing a framework for teachers to study learning from an asset-oriented perspective and a multimodal data set. The need for teachers to reflect critically on their assessment practices is also forwarded by my conceptualization of assessment as narrative, proposing knowledge about learning is narrated in ways that are mediated by context and power. I set out to explore the affordances of video for doing this kind of work; one of the things I discovered was the affordance of learning collaboratively. But the most pressing question for assessment pedagogy today is how to help students to improve ‘achievement’ by studying their own learning. The implications for my doctoral work are to investigate the affordances of collaborative video inquiry for teacher with teacher, teacher with students, and peer feedback.

Petra Hendry (2009) taught me that all inquiry is narrative; Arthur Frank that stories are actors (2010). Everything we say is a story to make sense of the world, and everything we do plays out the stories that make our worlds. The problems, characterizations, and explanations of a story are theories of action (Latour, 2005). From the excerpt of my SSHRC doctoral scholarship application in 2017 that opens this chapter, you can infer that I was working through a tangle of assessment with achievement; an approach to critical narrative research, a gesture to – what? Theories of literacy, sociomaterialism? And a move toward more multimodal, participatory methodologies. You can see that I

was a teacher of children, that literacy plays a role; that the problem was, I was not paying attention.

A title sets up a story by encapsulating the problem or foreshadowing the conclusion. To improvise on Bochner (1997), maybe there is nothing so theoretical as a good title. The title for my thesis proposal was “Participatory Assessment for 21st Century Learning.” Now in this introduction to the body of work that integrates my thesis, I drop hints about why the title has changed, but I leave the climax for the conclusion. Similarly, I am only dropping hints here about how I conceptualize formative assessment, what I mean by literacy practices, and where I stand on the topic of 21st century learning, because much of the work of theorizing in this study happens through it (Clandinin, 2016; Latour, 2005). But this thesis is in partial fulfillment of a PhD in Curriculum Studies. I do feel compelled to answer this one: “What does assessment have to do with curriculum inquiry?” That was the question a reviewer asked when I submitted a proposal to present part of my doctoral work at a curriculum conference in 2018.

1.1 Assessment narratives

I began to think about assessment as paying attention when I started my Master of Education degree. I didn’t come into graduate studies wanting to be a researcher or a scholar – as a teacher I was ready for more, but not sure of what. I enrolled in the Curriculum Studies program because that’s what teachers do – plan and teach curriculum. Dillon (2009) divides the field into three queries on the nature, elements, and practice of curriculum. It’s always been about practice for me. My first course, ‘Introduction to Curriculum Studies,’ was a rocky trip over the terrain – online and impersonal, I wrote out my resistance to rethinking my practice with a passive-aggressive candor. But I had my first generative moment when we spent time on the relationship of assessment to curriculum through A. V. Kelly’s *The Curriculum*. “The assessment tail will always wag the curriculum dog,” he wryly observed (Kelly, 2009, p. 148). “I’ve come to believe that it’s more important to plan how we are going to assess, than what we are going to teach,” I wrote. My Master’s thesis introduced a methodology of *video inquiry* (Ott, 2016) for

teachers to re-vision their practice formatively, inspired by the philosophy of pedagogical documentation (Forman & Fyfe, 2012) and the pedagogy of multiliteracies (Cope & Kalantzis, 2015). This study asked how studying learning multimodally and collaboratively might change teachers' "assessment narratives" – the stories they tell about learners' strengths, needs, and next steps.

1.2 Curriculum making

I came out of my master's as a practice-based researcher. The goal of a PhD is to produce a philosopher of practice. Early on in my doctoral story, I had something of an existential crisis. What do curriculum scholars do? Michael Connelly and Jean Clandinin offered wisdom to me:

We need to listen closely to teachers and other learners and to the stories of their lives in and out of classrooms. We also need to tell our own stories as we live our own collaborative researcher/teacher lives. Our own work then becomes one of learning to tell and live a new mutually constructed account of inquiry in teaching and learning. What emerges from this mutual relationship are new stories of teachers and learners as curriculum makers, stories that hold new possibilities for both researchers and teachers and for those who read their stories. (Connelly & Clandinin, 1990, p. 12)

The theme of inquiry in curriculum making is one of two "connective tissues" (Ott, 2020) embodying this thesis about formative practice in 21st century literacies. The other is the fact that the results come from an overarching study initiated by my supervisor, Dr. Kathy Hibbert, about multiliteracies in 21st century learning. Designed as a digital sandbox for playing with a cloud curriculum and funded by a SSHRC Partnership Development grant with QWILL Media and Education (Quality Writing in Literacy Learning), this research explores how teachers and students make curriculum in the 21st century as they redesign a literacy program developed in the 20th century by celebrated children's author and teacher Lois Burdett (Burdett, 1997; QWILL, 2014). One of the findings in the pilot study (Ott, MacAlpine, & Hibbert, 2018) was that the assessment rubrics provided in the literacy program did not attend to the depth and breadth of

multiliteracies opportunities in the mentor curriculum (Hibbert, Ott, & Iannacci, 2015), even before the participants made new possibilities.

1.3 Research puzzles

Each findings chapter in this dissertation is designed as a journal article or book chapter that responds to calls for research on 21st Century learning, curriculum making, and formative assessment. As such, each paper stands alone but is also a chapter in the story. Take note of words like *attention* and *attunement*, *noticing* and *narrative* across the papers, and you will see a theoretical argument take shape about how inquiry makes space for practice. Questions matter (Ott & Hibbert, 2020).

The research puzzles in my doctoral proposal were:

- 1) How might students and teachers redesign assessment in participatory ways in the QWILL curriculum?
- 2) What assessment narratives are composed when teachers, students, and activities are assembled?

These questions were framed as emergent puzzles, because the research was designed to be conducted with participants and therefore responsive to their interests and experiences (Clandinin, 2016). Guided by Delandshere's (2002) question about assessment as inquiry, "What does it mean to know?" my research design signaled a fresh way of thinking about formative assessment as research, and a contribution to a sociomaterial understanding of who/what participates in knowing. This purpose was introduced by a literature review of formative assessment summarized in chapter 4, "Assessment in 21st Century Learning" and sharpened by the pilot study, included here as chapter 3, "Seeing Double" because it is germane to my understanding that assessment goes beyond intentionality to materiality. Seeing double in this way is also the story of chapter 2, "Performing Fieldtexts," which describes how the methodology works.

As my research in assessment practices in literacy curriculum making unfolded in participatory ways through approaches to narrative inquiry, video inquiry, and actor

network theory, my guiding question shifted to “How does knowing matter?” On its own, chapter 5: “Magic and Monsters” may seem to have nothing to do with formative assessment, but read as part of the research narrative, it has everything to do with how the final title came to be. Whether I am able to answer my research puzzles or set new ones is the task for the conclusion in Chapter 6. The remainder of this introduction provides a short primer on the participants and theories informing my study, followed by a chronological organization of the chapters.

1.4 Study sandbox

Figure 1 below, “Curriculum Sandbox” paints the study methodology by the numbers. Materialized in this way, without evoking the immaterialities of interest, disinterest, joy, anxiety, passion, sadness, energy, avoidance and play embodying the actors, the spacetime matter of this study is flattened.

Methodology: A Curriculum Sandbox

1 curriculum

2 school years

6 classrooms

7 teachers

50 hours of class time

100 students

500 fieldtexts

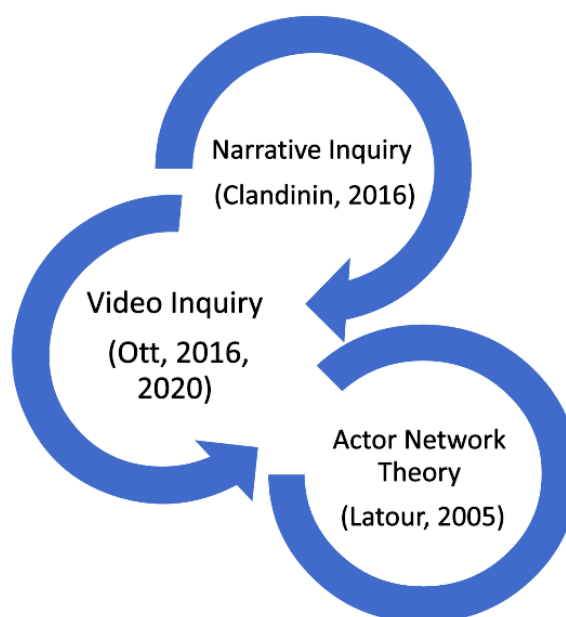


Figure 1: Curriculum Sandbox

The story of the curriculum we played with – a literacy program based on the mentor text of Shakespeare’s play, “A Midsummer Night’s Dream” is a significant actor in all the curriculum enactments, although one I backstage to foreground new improvisations. Playful, relational work in classroom curriculum making assembled this sandbox, and I am one of the 7 teachers. The ethics of conducting and reporting research apply not only to my research with educational communities on assessment puzzles, but to assessment as inquiry in general, and go far beyond the masking of identities and postures of reflexivity.

Participatory research seeks to break down insider/outsider dichotomies by treating the researcher as one of many participants, co-creating and disseminating knowledge in a range of ways, depending on needs and interests. In narrative inquiry, this work is called relational ethics:

As narrative inquirers, we become part of participants’ lives and they part of ours. Therefore, our lives – and who we are and are becoming, on our and their landscapes – are also under study...Relational ethics live at the very heart, perhaps are the very heart, of our work as narrative inquirers. (Clandinin, 2016, p. 30)

The ethics of participation in practice is one of the inquiries traced diffractively through this study. While we had institutional research ethics board consent from both Western University and the school boards in which the research was conducted that included consent forms for teachers and parent consent/child assent forms for students (ages 9-12), as an emergent and relational approach to research consent was an ongoing process of negotiation through every research encounter (Ott, 2020). Complicit in this work is an ensemble of onto-epistemological stances which might be described as posthumanism (Barad, 2003), complexity thinking (Davis & Sumara, 2006), and sociomaterial approaches to research (Latour, 2005; Mol, 2002). These methodological orientations afford attention to the complex improvisation of space, time, and matter through practice, and the agency of more than human actors in practice making:

These perspectives share insights about the indeterminacy of knowledge, and the instability of definitions of who counts and what matters, which add much needed complexity and critique to the 21st century learning discourse seeking to

respond to or profit from an indeterminate and unstable world. The terms perform, enact, and assemble can be interpreted synonymously in [this study] but if it is helpful to think with distinctions, ‘perform’ suggests the continual making of practice, ‘enact’ reminds us that there can be multiple versions of a practice, and ‘assemble’ draws attention to the agency of more than social actors in practice making... Mol and Latour’s work in actor network theory has also been influential to researchers in education for thinking about the ways different assemblages enact different relational spaces.

‘Relational space’ in this type of work is not only a social metaphor for ways people can relate to one another, as in the teacher-student relationship. More than social, relational space in a topographical, spacetime sense refers to the way that space is made through relations between actors (Mol & Law, 1994). Picture a spider web instead of a circle, or a folded map bringing the far near. (Ott & Hibbert, 2020, p. 3)

1.5 Organization of the thesis

Chapters 2 to 5 were more or less written in the order they appear. Chapter 2 tells the arc of the research story that played out from Chapter 3 to 5. Please note that the published chapters have copyright permission to use author versions of the accepted manuscripts for dissertation. With a few minor tweaks, Chapter 4 is reprinted as is. The publisher style guide required writing “in the objective third person,” but I was able to make some exceptions for the narrative inquiries. Chapter 2 is longer than what made the editor’s cut, because, to borrow an idea from one of the participants in Chapter 3, this is “the story of how I wanted it.” We do a dance with our reviewers too. Chapter 3 is an article published in a European journal, and the editors required that “students” be changed to “pupils” in every case. I joked with my co-author Kelly MacAlpine that every time I read “pupil” now I feel like I am being poked in the eye. It is reprinted here as the author version with the original wording. However, it may be that poking readers in the eye is not such a bad provocation, in a chapter about perspective in a thesis that raises questions about participation in assessment. The word “pupil” in both senses of its use is a metaphor for the phenomenon that when you look in someone’s eye, you see a tiny, doll-like figure (from the Latin *pupa*, doll – Merriam-Webster, n.d.). We are in the eyes of our beholders.

1.5.1 Chapter 2

Performing fieldtexts (Ott, 2020) begins with the question: “What am I tuning into, and what am I missing?” and ends with “what are *we* tuning into?” I describe how my ensemble of multimodal materials and questions about the social and material actors in curriculum making danced in ensemble with other participants, performing fieldtexts. Written for a book on fieldnote practices in education research, this chapter is a contribution to narrative inquiry because it teases out the material affordances of different kinds of text-making. It also extends my work on video inquiry by describing how it can be used for re-membling, re-visioning, and envisioning practice.

1.5.2 Chapter 3

Seeing double: Design and enactment in a lesson on perspective-taking (Ott, MacAlpine, & Hibbert, 2018) tells the story of three enactments of a key lesson in the QWILL curriculum about seeing a situation through another’s eyes. Although not about formative assessment directly, this paper introduced key concepts about the topology of curriculum making and the influence of “silent actors” such as graphic organizers, success criteria, rubrics, and assumptions about literacy achievement as not only players in, but directors of literacy practices. The question about how assemblages of students, teachers, and materials compose assessment narratives came through this work, because we saw that purposes and practices of assessment could not be overlooked in curriculum making.

1.5.3 Chapter 4

Assessment in 21st century learning: Improvisation and inquiry (Ott & Hibbert, 2020) invited teachers to play with literacy and assessment practices in the QWILL Curriculum. The question explored in this chapter is what produced these formative pedagogies, and how they made space for inferential, iterative, resonant and fluid literacy practices. This chapter contributes to a handbook of formative assessment in education by offering a more complex understanding of assessment as formative pedagogy, and a frame of

reference for understanding the kinds of inquiry work embedded in literacy practices that can help to organize cross-disciplinary 21st century learning.

1.5.4 Chapter 5

Magic and monsters: Collaborating with Google in 21st century literacies (forthcoming) is my response to two prompts by my committee member, Dr. Rachel Heydon. After I explored materiality in chapter 4, Rachel asked me to consider how immaterialities (Burnett et al., 2014) also matter in assessment and curriculum making. Then, when I told her I was writing a paper to help teachers participate formatively in the kinds of collaborative practices with Google Docs I observed in the study, she mused, “are we collaborating with a monster?” Chapters 1 and 5 are bookends to the study, with that subtle shift in emphasis to how knowing matters. These chapters draw attention to ways in which fields, texts, researchers, teachers, students, technologies, and other intended and unintended consequences are entangled with and emerge from the im/materiality of inquiry.

1.5.5 Chapter 6

The conclusion to my thesis situates the papers in the different research conversations they contribute to, highlighting theoretical concepts developed through the study and demonstrating implications for further research. My integrated program of research goes beyond literacies and beyond assessments to trace the complexities of inquiry in emerging practices.

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Chapter 2

2 Performing Fieldtexts

This chapter stories my experience developing a methodology for making fieldnotes using approaches to narrative inquiry and video inquiry. I discuss how I composed texts using smartphone videos and handwritten notes in elementary classrooms over a two-year period. This multimodal ensemble allowed me to document a rich diversity of meaning making in curricular practice. My smartphone became an assistive technology for following participants' mobile and multisensory actions. However, as this research narrative illustrates, texts are not only design choices about how to compose data in the field. The negotiations of presence and inquiry woven as connective tissues between human and material participants in a research ensemble perform field and text together as embodied entanglements. I offer possibilities for caring for a body of inquiry by seeing with participants to re-member, re-vision, and envision fieldtexts.

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2.1 Introduction

November 9, 2016
Classroom 1, Observation 1

When to take notes and when to use video? How to decide what to record and when to stop? How to get best quality for study? I seem to be getting a sense of 'narrative chunks' as the lesson plays out. Why and how? What am I tuning into, and what am I missing?

I asked these questions in the first fieldnote I wrote as part of a narrative inquiry about curriculum making as a sociomaterial practice, a study exploring the doings of teachers, students, and materials (Ott, MacAlpine, & Hibbert, 2018). The field work in

this study included making written notes and smartphone video recordings of classroom activities and discussions about the curriculum with teachers and students.

Fieldnotes have a rich disciplinary association with being an anthropologist (Jackson, 2016). But researchers in education tend to select methods suited to our questions, a pragmatic approach that can open us to critiques about unconsciously adopting blind spots from disciplinary modes of inquiry. The anxious tone in my fieldnote is about more than the worry of getting the right kind of data for a research study, it is about the question of fieldnotes as gaze. What kinds of questions can we answer by sensing multimodally? And how do our perceptions intervene in the world?

Part of the work of this research narrative is to envision possibilities for using a smartphone in field research. But this is not simply a chapter about how to make multimodal fieldnotes, or what questions they might answer. This story is an exploration of how research performs the field through questions. My first fieldnote marks the beginnings of an inquiry theorizing my fieldnotes as entangled, embodied performances of field with text. To frame this inquiry, I briefly introduce my methodological resources for meaning making: Narrative inquiry and sociomateriality.

2.2 Narrative inquiry

Teachers are more than curriculum takers (Clandinin & Connelly, 1992). My research in curriculum making is situated in narrative inquiry, a methodology developed through research in curriculum as storied experience by Michael Connelly and Jean Clandinin (1990). Narrative inquiry shares an affinity with ethnographic approaches for spending an extended time researching experience; it also aligns with methodologies taking an ethical stance on research that seeks to be with and for participants (Clandinin & Connelly, 2000).

Narrative inquiry has distinct traditions about what fieldnotes are and the work they do. Here, fieldnotes are expanded as field texts to emphasize that field data is composed (Clandinin & Connelly, 2000). Researchers story experience into texts, whether through written notes, recorded sounds and images, or collected artifacts (Connelly & Clandinin, 1990). Field texts are compositional arrangements, made relationally through negotiations of presence with participants, and made again as meanings of texts are re-storied while researcher and participants inquire with and through them (Clandinin, 2016; Clandinin & Murphy, 2009). However, while narrative inquiry offers rich insights into what it means to compose and inquire about field texts with participants, it provides little guidance as to how different modalities of texts change our ways of knowing. And the focus on human relations in narrative research more generally risks making assumptions about participation that overlook the agency of other kinds of actors in meaning making (McKenzie & Bieler, 2016).

2.3 Questions of Materiality

My research in curriculum making is also situated in a broader project about curriculum making as sociomaterial practice. Methodologies with sociomaterial orientations seek to answer questions that are overlooked by research that focuses only on social actors and relationships (Fenwick & Edwards, 2013). While diverse in disciplinary and theoretical focus, theorists exploring material agency and relations use verbs such as assemble (Latour, 2005), enact (Mol, 2002), and perform (Barad, 2003) to emphasize that what comes to be described as social, as material, and as practice are not givens but continual makings. To theorize my practice in making fieldnotes, I bring Barad's thinking on performative relations (2003, 2007, 2012) into conversation with Clandinin's (2016) relational approach to composing field texts as the chapter progresses.

2.4 Entering the story

An authentic research narrative (Clandinin, 2016) has the problems, ambiguities, and emotional resonances that allow readers to imaginatively enter an experience and find

opportunities for seeing and doing things differently. Starting with the questions posed in my first note, I story this chapter as three movements of an unfolding methodology, a re-search of my study. In the first movement, I describe my approach to video inquiry (Ott, 2016), using smartphone video recording as an assistive research technology. However, the advantages of composing texts through different research modalities also come with constraints, not only on ways of knowing, but on ways of relating. As my inquiry progressed over time and through different classrooms, I became increasingly aware of the ways that fields and texts are entangled with questions. The second movement illustrates how the relations between human and material participants and inquiries are the connective tissues embodying field and text. This movement explores how inquiry performs field with text. From this point forward, I refer to field and text as becoming together: fieldtext. In the final movement, the story continues from making to analyzing fieldtexts. I present some of the difficulties foreshadowed by my final question, “what am I tuning into, and what am I missing?” to consider response-abilities (Barad, 2007) for performing fieldtexts.

2.4.1 Movement 1: Assistive research technology

How might different recording modalities assist in making fieldnotes? Anthropologist Jane Burrell (2016) described the affordance of incorporating layers of meaning through images in her approach to cross-referencing fieldnotes, “I found they integrated within their frames great quantities of detail that were not reflected in the [written] fieldnotes” (p. 142). Research in multimodality has explored how different modes for communication design meaning (Bezemer & Kress, 2008), change meaning as one mode is translated into another (Cowan & Kress, 2017), and expand ensembles for meaning making (Mckee & Heydon, 2015).

In my master’s research, I began exploring how video recordings could attune teachers to the multimodality of learning (Ott, 2016). In education settings, assistive technologies work best when they are simple, accessible, and unobtrusive in use (Peterson & Murray, 2006). I asked teachers to record short videos of learning activities they had questions

about, using familiar personal or classroom technologies, such as smartphones and tablet devices. We then studied these recordings together through multiple viewings, at first by tuning out the sound (Rowe, 2012) to attend to the silent agencies of non-verbal communication and material resources for meaning making. One of the unanticipated findings was that we sometimes saw actors we did not expect to see pressing into view. Video inquiry can assist the study of layers of modality and a wider frame of reference (Ott, 2016).

The multimodality and accessibility of smartphone video recordings has advantages for composing fieldtexts, as the following vignette from my first classroom observation illustrates:

As I began observing in classrooms for my doctoral work, I planned to write fieldnotes along with recording images and conversations of the teachers and students innovating with the curriculum. There was just one problem. I could write about what was being said, or what was being done. I tried solving this dilemma by placing an audio recorder on a table to record a small group discussion while I took notes. Then the teacher called me over to show me something about a curricular material she wanted to change. As I frantically scribbled in my notebook, she pointed to different parts of a graphic organizer for a writing activity, showing how she would redesign the size and order of the boxes to “give more weight” to the thinking. I held up my hand for a pause: “hold on for a minute – can you do that again?” Raising an eyebrow, she asked, “why don’t you just take a video?” And there was my smartphone in my pocket, ready to assist.

Reviewing the data from this observation with the research team in the curriculum development project, we noticed two things. First, the video had the teacher’s voice about “more weight” on record. Using the approach of tuning out the sound for video inquiry, we were also able to focus on the silent actors of the other curriculum materials and the use of time in the lesson. By taking a layered approach to attending to these actors through multiple viewings, we saw how materials and time make spatial weight that is productive for generating depth of thinking in writing (Ott, MacAlpine, & Hibbert, 2018). But we also had the audio recorder data, and so we were able to contrast the cacophony of background classroom noise on the audio recording with the clarity of sound in the

video. One of the team members pointed out the higher quality sound filter on my phone. I remembered the affordances of accessible video recordings from my study of video inquiry and added noise filtering to the list.

As my doctoral work moved into the study of curriculum making, I soon discovered that the scratchiest of jot notes could not keep up with the complexity of what I was seeing and hearing, but a video recording would allow me to revisit both modalities. The mobility of smartphone video recording also enabled me to see the (im)mobility of material actors and follow their potential agency in assembling practices (Latour, 2005). I used my smartphone as an assistive research technology to extend my sensory capacities to see, hear, and follow action as I studied curriculum making in different classrooms. It also seemed that the smartphone was no more obtrusive or unwieldy than a notebook and pen. That doesn't mean accessibility is free from accountability.

Issues of framing and positionality are hardwired in research, from the perspectival technologies of the recording device to the researcher (Haraway, 1988). Turning to the next movement, I take up the question: "When to take notes and when to use video?" by first sharing a vignette based on my classroom observations. I use this vignette along with illustrations to explore how interests in composing texts that were sensitive to classroom practice performed the connective tissues that embody these fieldtexts.

2.4.2 Movement 2: Connective tissue

I began each classroom observation on the margins, positioned by the teacher at the front giving direction to the class, pushed to the edges of the room by the students watching from their desks. I took notes of the date and time, the opening remarks of the teacher, and drew rough maps of the arrangement of desks and technologies in the room, if it was the first time, or if I noticed any changes. I learned to open my senses to the experience, to become aware of what was happening with the teachers, with the students, and with myself. What experiences were unfolding? Sometimes, at the beginning, I would take a few quick pictures of other materials on the borders of the room. What would be their role in the curriculum making? Although the pictures could only display the actors, not reveal their action, I always felt shy about recording video of the students right away. Even on the margins, it felt more obtrusive, with my hand

holding up my smartphone for all to see. In one classroom, early on, a student turned around, noticed me recording, and frowned. I quickly put my phone down and hid in my notebook. Which is not to say that my notebook was a camouflage. On more than one occasion students asked what I was writing about them in my journal.

My notes were private encodings, while the video recordings appeared to enfold a public spectacle. Still, visual research risks revealing placed identities and meanings in ways that anonymity in writing can conceal. The study ethics protocol included a menu of options for the use of visual observations (Mitchell, 2011), and some families did not consent to having their child's image in my fieldtexts. Some teachers tried to solve this problem for me by choosing seating arrangements and activity groupings ahead of time, but there was never a perfect solution due to the constant ebb and flow of life in the classroom. From transitions between groupings to movements to bring materials into action, nothing stays in place in a classroom for long. Many times, my answer to "when to take video" was to *not* take video – putting the camera down to record a note instead, as I did when the student frowned at me or when I needed to move out of the way or into a better position.

Narrative inquiry emphasizes not only that data be composed in many textual modes, but that these compositions emerge through the different experiences of researcher and participant coming into relation (Clandinin, 2016). Here, text is both a design consideration and a negotiation of presence. Drawing on the physical performance metaphor of dance and recalling how a friend called my field notebook "the connective tissue" (Amber White, personal communication, 2018), I offer the metaphor of connective tissue to weave these considerations into my understanding of the embodied entanglement of fieldtexts.

As a narrative inquirer, I observed practices of curriculum making with narrative relations: problems, actions, resolutions. Sometimes, as the vignette demonstrates, I put my smartphone down and picked up my notebook to solve a tension between my purposes for being in the classroom and those of the teacher and students. I also noticed

that wherever I was positioned, the teachers took a stand on the opposite side of the room. Front, back, and side to side, we danced a set of relations and produced an inquiry field. I also danced with the students. I would circle in as they began an activity, warming them up to my presence and sensing through the openness of their eyes and shoulders whether they wanted me to listen in or move away, before I began recording with the smartphone. Some of my fieldtexts are conversations video-recorded with the students and teachers, as I asked questions about the meaning they were making with the curriculum materials. Sometimes students approached me, wanting to show me their work. My smartphone and notebook were extensions of my hand, my eyes, my ears, my interests, and my feelings. Yet the texts I composed are also embodiments of the teachers' and students' interests and desires moving in and out of my gaze.

Emotions are productive materially, forming bodies through desire and avoidance (Ahmed, 2014). It is these kinds of human negotiation of presence, sometimes spoken but often felt, that Clandinin suggests create not just field texts but the field itself: "In narrative inquiry we negotiate with participants a relational space for inquiry, a relational space we call the field" (Clandinin, 2016, p.10). However, during each classroom observation, I also took a "nomadic" approach (Sørensen, 2009, p. 24), forcing my gaze away from the narrative action to attend to the silent actors of materials, space, and time (Ott, MacAlpine, & Hibbert, 2018). Decentering human agency to study materiality requires conscious work to disrupt familiar ways of being (Sørensen, 2009). Because I was sensitive to material agency, I noticed that the spatial arrangements of classroom resources such as desks, computers, and digital whiteboards positioned where the students, the teacher, and I could be in relation to these materials and to each other. As we worked with and around them, these materials also negotiated the embodiment of fieldtexts.

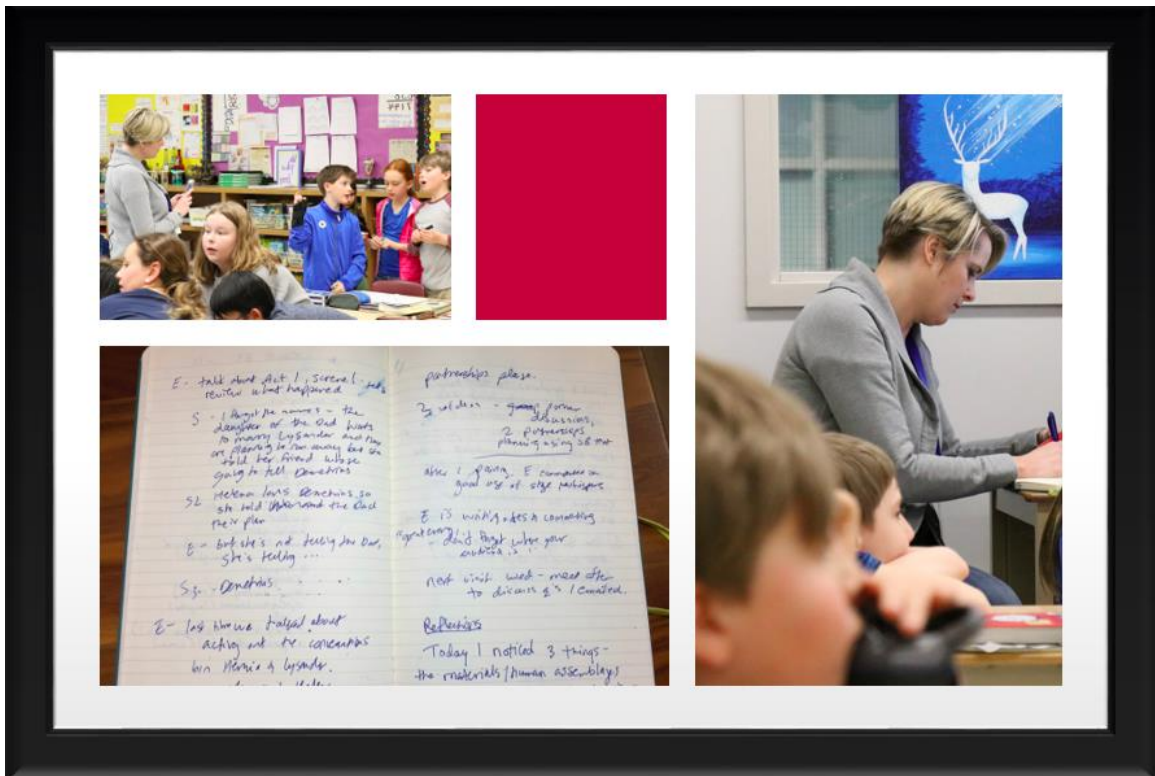


Figure 2: Connective Tissue

Figure 2 traces some of these embodiments of inquiry. The journal with jot notes sits between photos of my dance between taking video and taking notes. The notebook is central because I didn't just write notes when I couldn't record video. There were times when I wanted to slow down, to engage in writing as inquiry (Richardson & St Pierre, 2005) by taking note of what I was noticing and questioning. I also wanted to keep a record of the contents of the video recordings, knowing that would be important for how I tagged the texts when I archived them digitally. My handwritten journal of descriptions, reflections, and questions formed a connective tissue of inquiry between my video recordings and digital analytic tools.

The ensembles of notes and videos composing the study fieldtexts are woven together through flows of inquiry, including choices in how to attend, with which human and material participants, and where, embodying the fieldtext inquiry space.

These fieldtexts are also not always my compositions, arranged as they were by

movements with, around, and sometimes against both human and non-human agencies. My ensemble of fieldtexts was performed in ensemble, danced into a body of inquiry. Ensembles for knowing perform what can be known – entangling matter with meaning (Barad, 2003).

For physicist-philosopher Karen Barad (2007), entanglement is more than a metaphor for complex interplays of relations, it is a term for the sensory experimentations through which space/time/matter is performed. Barad draws on her understanding of quantum mechanics to demonstrate that matter is materialized through practices for making known, that require setting boundary conditions on observer and observed. Change the observational arrangements, and seeming stable constructs of time, space, and matter can be reconfigured in ways that demonstrate how spacetime/matter become together, entangled with practice (Barad, 2007).

My story of connective tissue demonstrates how my smartphone and notebook were extensions of my senses and experimentations and danced a set of relations between other materials, bodies, and interests that performed field with text with inquiry as embodied fieldtext. This knowing/becoming together carries deep responsibilities for ethical practice: “in a breathtakingly intimate sense, touching, sensing, is what matter does, or rather, what matter is: matter is condensations of response-ability. Each of ‘us’ is constituted in response-ability” (Barad, 2012, p. 215).

Anthropologists describe fieldnotes as evocative (Jackson, 2016). The multiple modes of experience embodied in the textual ensemble of smartphone videos and notes assist me to recall the sensations of my research as I move into analysis. What are my ongoing response-abilities to this knowing together? In narrative inquiry, texts are more than evocative. Clandinin (2016) wrote that as participants and researchers in a narrative inquiry meet in the midst of their experiences, “[they] begin to shape time, places, and spaces where we come together and negotiate ways of being together and ways of giving accounts of our work together” (p. 44). Texts in narrative inquiry should function ethically as provocations, starting points for questions about the shared experiences that

produce a field of inquiry and questions about how to story these findings into new experiences. In Movement III, I share examples of re-storying my fieldtexts to discuss response-abilities for performing findings through re-membering, re-visioning, and envisioning. I begin this movement with the story of Joy.

2.4.3 Movement 3: Re-storying

During my first visit to this classroom, I walked around and commented positively on the students' writing. Afterwards, the teacher told me that she noticed one student who "glowed" after I noticed her. On my next visit, the student, who I call Joy, gifted me one of her drawings about the play they were learning about in the curriculum. Each time I came back, Joy had something new for me. One day the class was working with individual laptops on a shared, multimodal text. It seemed to me that Joy was watching her partner but unable to contribute to the print/visual assemblage on her own computer because she struggled to keep up with the composition. I moved in to help her read some of the words appearing on her screen. But I sensed Joy distancing herself. There was no gift that day. The next week, she brought me a list of the character's names she had copied from the play. As I wondered about this and shared my thinking with Joy's teacher, I understood that I was placing my concerns about literacy onto others.

2.4.3.1 Re-membering

This movement engages with the question in my first fieldnote: "what am I tuning into, and what am I missing?" Narrative inquirers judiciously invite their tensions and uncertainties into the relational field with participants in what Clandinin described as interim texts (2016). We attend to difficulties and blind spots as the starting points for possible understandings. As we revisit our research experiences in the interim phase with participants, we have opportunities to re-member – to imagine and embody ethical possibilities for being together, while we are still together.

Marilyn Huber (2008) recognized the tension she felt when her meanings did not align with her participants as a necessary "dis-positioning" (see Clandinin, 2016, p. 77). The dis-positioning I sensed in Joy prompted me to re-member my understanding of literacy. Another act of re-membering through this story is the work of making things visible.

When we attend with participants to “the composed gaps and silences” in our texts (Clandinin, 2016, p. 46), to the moments of difficulty and uncertainty that spark awareness that in tuning in to one thing, we may have missed another, we are able to envision more possibilities. Inquiring with Joy’s teacher into the reasons for her silence allowed me to see how Joy was repositioning her embodied relation to me as a literate student.

2.4.3.2 Re-visioning

In another example of inquiry with Joy’s teacher, she wondered how her students were collaborating in a drama activity. We decided to use video inquiry and she made short recordings on her iPad of the student groupings at work. Re-viewing these together, she described the communicative resources she saw Joy using: “look at how she is using her eyes and positioning her body to focus on her group and engage their ideas.” The multimodal record of Joy’s group talking and moving together afforded a richer analysis when this teacher revisited the experience, an analysis amplified as we discussed ways she might use this understanding of collaboration formatively. Our shared uncertainties and tentative interpretations performed an inquiry space about how to extend Joy’s strengths as a learner. Again, it was the experience of wondering together that opened our borders to performing a new fieldtext.

Coded relations (Edwards, 2015) between the software and hardware of my smartphone, computer, and institutional digital archive, also see with me in ways that re-materialize the fieldtexts. Using Onedrive, a suite of software applications bundled in Microsoft Office 365, I can upload data, stream videos, and transcribe or describe the contents in Word or Excel documents within the same platform. Our research team chose Onedrive because it works within our institution’s sanctioned and technologically supported policies for secure data storage, allowing shared access to team members from other research sites, both in Canada and internationally. But this archive does not allow us to tag the data with multiple codes by different users. To work around this, I split the screen between thumbnail images and a Word document and give brief descriptors of the

data using my journaled notes so that I could later add these to a shared coding spreadsheet. This digital fieldtext is a new embodiment of the classroom inquiry space for others – it is the field re-visioned, a fieldtext that has travelled some way from the original participants in the inquiry and has still farther to go.

The travel metaphor is a familiar and problematic trope for research, particularly for field work (Fine, 1994). Relations materialize fields. Burkholder, Makramella, Abdou, Khoja, and Khan (2015) outlined four sets of relations at work in participatory visual research: participants and society, researcher and participants, participants in community, and power to disseminate. In my inquiries of curriculum making, schools and classrooms involved societal and community relations with tight boundaries (Who gets in? Who gets a voice?). I often felt powerless, even as a former insider-teacher, working as outsider-researcher trying to negotiate entries to these borders. Then again, the teachers often had expectations that they owed me something: “Are you getting what you want?” And the students wondered what I was taking away: “What are you writing about us?” and “What will you do with those videos?”

2.4.3.3 Envisioning

It is my last day observing in this classroom. The class has just performed their adaptation of the play featured in the researched curriculum. In a bold stroke of curriculum making, this teacher translated the curriculum materials from a print-based set of literacy practices into one that was drama-based. I ask the students for their perspectives on how the curriculum should be re-designed. The students agree, “It’s so much more fun when it’s acted.” What words fail to express is the feeling in the room. I have a picture from today, which I don’t have permission to share, of students watching their play with their arms wrapped around each other. What kinds of curriculum making practices might such a multimodal fieldtext envision?

In this fieldtext, I negotiate presence and inquiry with participants as one way to reveal different facets of vision. Composing texts with multimodal ensembles offers another way to refract rich layers of meaning for inquiry. Multimodal fieldtexts are instruments for tuning in to seeing, hearing, and feeling experience. But instruments do not just tune

us in, they produce the noise – field and text are the entangled, embodied performances of inquiry. I have learned to consider “what am I tuning into” a reminder to act in sensitivity with the participants performing fieldtexts. In answer to the final question of my first fieldnote: “what am I missing,” I re-member that it not my privilege or possibility to carry away every experience in research. Instead, I care for the responsibility that I embody some of these fieldtexts in new relations.

2.5 Conclusion

The questions in my first fieldnote about how to observe—and through which modalities—led me to orchestrate narrative inquiry and video inquiry into a relational methodology for performing fieldtexts. In this chapter, I drew on Clandinin and Connelly’s (2000) work to explore how the composition of multimodal texts provides a rich research ensemble for hearing, seeing, and sensing the sociomateriality of experience.

As the story began, I showed how smartphone video recording can be an assistive research technology by amplifying meaning and affording a nomadic performance of attention, providing access to multiple modes, actors and vantage points. A video records the things we intend to see, some things we don’t intend, and things we may not pay attention to. Backgrounded actors may press into view, disrupting our gaze and expanding opportunities for meaning making. The re-visioning afforded by video inquiry, a layered and collaborative attention to the multimodality of making meaning, provides a richer attunement to experience. Tuning out the sound in a video recording, for example, helps tune us in to other resources for meaning.

In the second movement, I illustrated how I put a multimodal ensemble of notebook and smartphone to work as assistive technologies in making fieldnotes. The smartphone extended my sensory capacities to see, hear, and follow the textures and contours of curriculum making in multiple classrooms. My notebook punctuated these mobile engagements, slowing me down to think with writing. But my stories also demonstrated

why we must not assume in field research that any kind of record of social practice records a public spectacle.

Through Clandinin's (2016) work on narrative inquiry, I became aware of how the field is performed relationally. I signaled this shift in thinking by introducing dance and connective tissue metaphors. I turned to Barad's (2003, 2007, 2012) work on the performativity of inquiry to understand how questions, observations, and instruments are entangled with space/time/matter—the practice of knowing materializes meaning. This means that apparent boundaries to what is public knowledge are not pre-formed. Knowing is performed (Barad, 2003). Field research is the opening of borders to make discoveries in which the field, the text, the participants, and the researcher are performed together. We dance a set of relations I describe as the connective tissues that embody inquiry. The meanings in this study are materialized by the connective tissues between what I observed and how I recorded those observations. For example, sometimes I was a researcher with pen and notebook making notes on conversations with teachers and students, while other times I was a researcher with a smartphone moving with and around other material bodies. Sometimes I made compositional choices, deciding when to inquire with notes and when to use video, and sometimes the questions, interests, and movements of other human and material participants, in Barad's (2012) sensory theory of mattering, made me.

Fieldtexts are the effects of these connective tissues, the entangled, performed, embodiments of inquiry. This tells us what fieldtexts can be. Entanglements are no more, or less, than “our connections and responsibilities to one another” (Barad, 2007, xi). So how should we care for a body of inquiry, which is knowing together? What are we tuning into, and what are we missing? These are complex questions about making fieldtexts, and I offered readers a story of research as a way to engage this problem through my experience of trying to work it out. The vignettes and discussion in this chapter are thought experiments about what fieldtexts do – how texts extend our sensory capacities, how field and text are performed together through

inquiry, making sense, how to be care-ful with embodied fieldtexts. As the story ended, I shared ways to enact care as fieldtexts are storied into new performances. Re-visioning by seeing with human and more than human assistive technologies can perform fieldtexts in multiple and multisensory ways, affording us more facets of expression along with opportunities to listen closely to composed gaps and silences. Remembering with participants in narrative inquiry allows us to reconstitute relationships in ways that might envision and embody more just possibilities.

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Chapter 3

3 Seeing Double: Design and Enactments of a Lesson on Perspective-Taking

This narrative inquiry of a lesson intended to develop perspective-taking links an understanding of teachers as curriculum makers with a sociomaterial attunement to the ways that materials, forms, and time are also actors in performing curriculum. We offer a close reading of three enactments of the same lesson in junior elementary classrooms and discuss ways that these instances of curriculum making expanded or diminished opportunities for students to communicate shifts in perspective through personal narrative writing. Reading diffractively, we also consider our participation in these enactments through our positions as teachers and researchers in literacy education and curriculum studies. We find temporal, spatial, and material resources, including schedules, technologies, and forms of assessment, to play key roles in shaping relations in curriculum making.

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3.1 Introduction

Curriculum making can be understood to mean activity at the state level in developing curriculum policy and national programmatic standards (Sivesind & Westbury, 2016). However, the field of curriculum studies acknowledges many translations of curriculum making when tracing policy text to classroom context, whether analysts adopt a systemic approach to study state, administrative or classroom levels of curriculum making (Deng, 2010), a poststructural understanding of the circulation of power through education discourses (Ball, 2015), or our preferred perspective, a sociomaterial attunement to how different agencies assemble curriculum (Fenwick & Edwards, 2013; Fenwick, Edwards &

Sawchuk, 2011). Our understanding of the classroom-based enactment of curriculum is also strongly influenced by Connelly and Clandinin's (1990; 1992) influential work toward a narrative understanding of curriculum making. In this body of work, curriculum is defined primarily as a life course (Pinar, 1975), rather than focusing on its more common notion of a program of study (Clandinin & Connelly, 1992), which opens possibilities to study curriculum making as a shared composition of experience between teachers and students.

Curriculum making at any level is made more complex as advances in technologies and new media revolutionize how educators and students participate in education. Initiatives for 21st Century learning, led by the Organization for Economic Co-operation and Development (OECD, n.d.), call for innovative educational models to foster the digital literacies and participatory culture that are the hallmarks of modern competencies. In 2012, education and business leaders in Canada asked: "What if we could harness the digital tools of today's world to provide higher quality learning experiences and opportunities for our children?" (Canadians for 21st Century Learning, p. 3). In a broad, multi-site study, we respond critically to this call through the context of a programmatic literacy curriculum, investigating the ways teachers and students make curriculum through 21st century technologies and practices. We also consider how these practices 'make' them.

Following Fenwick and Edwards (2013), we ask, 'How is pedagogy effected sociomaterially?' and 'What forms of knowledge are both possible and responsible to students in these assemblages?' To answer these questions, we partnered with QWILL Media and Education, Inc. (QWILL, 2014) on the research and development of a digitized literacy program for junior elementary students (ages 9 – 12). QWILL educator and author Lois Burdett developed a set of teaching and assessment materials designed to work with interactive whiteboards, based on her 1997 adaptation for children of William Shakespeare's play, *A Midsummer Night's Dream*. The goal of the QWILL program is to

afford a rich ‘thinking’ curriculum, through an immersive experience in the themes of the play and in-depth exploration of the writer’s craft (QWILL, 2014).

In this paper, we offer a close reading of three classroom enactments of one of the lessons from QWILL, “Seeing it My Way,” which is intended to foster the development of empathy through perspective-taking in personal narrative writing. We analyze the ways that empathy is performed in double — simulated and achieved, through the design and enactments of the lesson. Perhaps it is no coincidence that, because we are studying a curriculum based on a play, we see curriculum making as a production. What surprised us in this study was that, even though we as designers – teachers and researchers – tinkered with the script, there were other, behind the scenes directors. First, we provide background to unpack the assumptions, distinctions and connections around our use of the terms design, enactment, empathy, and perspective-taking. Then, we discuss how collecting and analyzing video field texts, using narrative inquiry and actor network theory (ANT) methods and perspectives, allowed us to ‘see double’, raising new questions about the topology of curriculum making.

3.2 Curriculum making as design and enactment

In even the most progressive of educational schemes, the teacher as director sets the tone for the story. However, earlier work highlighted the diminishment of teacher agency in curriculum making through the neoliberal production of ‘purchased pedagogies’ (Hibbert & Iannacci, 2005). We began this project optimistically looking to the updated framework to the pedagogy of multiliteracies, learning by design (Kalantzis & Cope, 2010; Cope & Kalantzis, 2015), to foster new agencies for teaching in this era of new learning. In their recent work, Cope and Kalantzis (2015) outlined a set of knowledge processes: experiencing the known, experiencing the new, analyzing knowledge, and applying knowledge. Teachers are positioned as curriculum designers, organizing learning around the four knowledge processes in the learning by design framework. We considered the affordances for designing learning using the QWILL curriculum through this lens (Hibbert, 2015; Hibbert, Ott, & Iannacci, 2015).

However, we have also been sensitized through the material turn in education research (Dalhberg & Moss, 2010) to see material as more than a factor in human activity, but also as an actor in producing activity (Latour, 2005) – how we see through materials, move around them, act with them, and are positioned by them. Our analysis of curriculum making in this study is guided by Mulcahy’s (2012) notion of double vision: “A sociomaterial account of learning allows one to see double: see the human and the non-human at once without trying to strip either away” (p. 125). Here, we use the terms enactment and design to mean double: that human actors in curriculum making may have designs for meaning and material, yet become designed in the enactment of meaning-making with material. Sociomaterial analyses, in foregrounding the spatial/temporal/materiality of relations, tend to highlight unseen actors, and unintended relations (Fenwick, Edwards & Sawchuck, 2011).

3.3 Empathy and perspective-taking

This research is a study of the enactments of a lesson designed to support the development of empathy through perspective-taking in narrative writing. The curriculum developer, as an elementary teacher, is attuned to the discourse on empathy in education, a lay discourse (Hodges & Klein, 2001) that assumes: 1) empathy is pro-social behaviour, and pro-social behaviour is badly needed in today’s world; 2) empathy is the practice of seeing things from another point of view; and 3) as empathy becomes conflated with perspective-taking, teachers are encouraged to develop this skill in students. This discourse on empathy has been critiqued in the literature for assuming that the ability to see alternate perspectives will always be used for good ends (Hodges & Klein, 2001), or, for ignoring evidence that empathy is a trait that some of us will be better at than others (Chopik, O’Brien & Konrath, 2017; Ickes, Gesn & Graham, 2000; Ruby & Decety, 2001). However, even reviewers of this literature admit that there is evidence to support the assertion that perspective-taking can be learned (Chopik, O’Brien & Konrath, 2017).

What we do in this study is focus not so much on the content of the lesson but its enactments, and the roles of the space/time/matter actors in these productions. The

findings presented are intended to promote critical thinking about more general applications to curriculum making. However, content matters, and lesson content has impact, leaving what Barad (2003, p. 873) calls “marks on bodies” that we must be accountable for. And empathy has costs (Hodges & Klein, 2001). Our findings account for the costs of empathy observed in the “Seeing it My Way” lesson. Lessons are designed to have effects, but if the constructs are not well understood, or the lesson has design flaws, there may be unintended consequences. We view QWILL’s program as a mentor curriculum, providing rich sets of texts and materials to teachers and students (Calkins, Hartman, & White, 2005). Our methodology, however, sees teachers as curriculum makers, and our work with teachers as inquiry into the possibilities and impossibilities of working in this space of seeing double.

3.4 Methodology: Research as story

The methods and perspectives we employed created a toolkit that allowed us to see double: to study the complexity of curriculum-making as both design and enactment. Ethnomethods of narrative inquiry (Clandinin, 2016) and actor-network theory (ANT – Latour, 2005) were combined to study three junior elementary classrooms in Ontario, Canada, using the QWILL curriculum throughout the school year. Ethnographic methods common to both approaches require include notetaking, mapping, audio-video recordings, collection of artifacts, questioning, discussion, and experimentation in the testing of ideas over an extended period of time. Analysis of the data builds upon Ott’s (2016) methodology of video inquiry, a form of collaborative inquiry that attends through multiple viewings to materiality and multimodal communication in audiovisual data through the processes of tuning out and tuning in.

3.4.1 Video inquiry

Video inquiry is inspired by the practice of pedagogical documentation (Rinaldi, 2012), which seeks to make learning visible for collaborative study. Rowe (2012) argues that research has traditionally over-relied on the analysis of transcribed audio recordings,

when there is a wealth of multimodal data available for study through other technologies. Tuning out the audio on a first viewing foregrounds the visual, gestural, and material data. Making the data ‘strange’ in this way also raises questions about the actions under review, which can challenge preconceptions. Tuning in once more to the audio, and discussing findings collaboratively, affords moments of re-visioning, from interpretation to justification of findings.

3.4.2 Narrative inquiry

Narrative inquiry is a methodology for studying experience and generating research findings through collaborative work with participants (Clandinin, 2016). Clandinin and Connelly (2000) developed an approach to data as text and composition when they began using narrative inquiry to study curriculum-making. “Field texts” are any artifacts gathered in the inquiry, including material of interest in the setting and observations recorded by the researcher in any mode. These recordings and gatherings are compositions because the researcher makes choices to produce them – data is designed. Field texts become “interim research texts” when the researcher begins to question her story (Clandinin, 2016).

In this study, we used video to record field texts, which were then used as interim texts with the teachers, and inquiry texts when we further developed our analysis into findings. Research texts in narrative inquiry are storied findings. Authentic research narratives are not cover stories (Clandinin and Connelly, 2000). Rather, they reflect the complexities, tensions, and different story lines common to experience. Resonant, authentic research texts allow audiences to see themselves in the stories, to wonder about them, and to invite new forms of experience (Connelly and Clandinin, 1990, Clandinin & Murphy, 2009, Clandinin, 2016).

Another critical aspect in establishing the trustworthiness of a narrative inquiry is to identify the author(s) as participant(s) in the study (Clandinin, 2016, p. 30). We cannot represent an authentic narrative inquiry without situating who “we” are. Our ways of

seeing are produced by our identities as educators and researchers: by the problems we define, the ways we interact, and our choices in what to attend to. Kathy Hibbert worked as an elementary and secondary teacher and curriculum developer for a school board in Ontario, Canada for many years. As the director of Western University's Interdisciplinary Centre for Research in Curriculum as a Social Practice, she has wide-ranging interests in multiliteracies pedagogies, sociomaterial methodologies, and narrative inquiry. Mary Ott, also an elementary teacher, now focuses her doctoral work on how assessment might be reimagined through multimodal, participatory, and narrative frameworks. Kelly-Ann MacAlpine brings an early childhood education background, positioning her as a relative 'outsider' in elementary school settings.

The focus of narrative inquiry, and critical narrative research in general, is to understand narrations of experience as the stories that can be told, as situated in the broader social discourses telling the story (Iannacci, 2007). What is absent from this analysis, however, is an awareness that it is not only the social, but also the material and environmental that compose experience (McKenzie & Bieler, 2016).

3.4.3 Following the actors: Actor network theory

In recent years onto-epistemological perspectives exploring the agency of space/matter/time in producing reality are being adopted to study educational phenomena (Fenwick & Edwards, 2013; Fenwick, Edwards & Sawchuk, 2011; Mulcahy, 2012; Sørensen, 2009). These approaches have been broadly characterized as sociomaterial, and are considered methodologies in that they encapsulate more an approach to inquiry that considers the social an effect of material-in-relation, than a defined set of questions or theories (Law 1999; Sørensen, 2009). Actor network theory (ANT) is one such approach for "following the actors" to understand how they assemble; that is, how actions are invited or excluded to form relations (Latour, 2005, p. 12). We do not approach this study as a classic actor-network analysis, however. Borrowing from the mathematics of topology, Mol and Law (1994) introduced the concept of social topology to actor network theory. In topology, space can be folded, stretched, and squeezed. Mathematically, shapes

that appear to be different can in fact have the same set of relations: a circle and a triangle are topologically identical (Decuyper & Simons, 2016). In social topology, actors that seem far apart geographically might be viewed as folded together through other relations, described through spatial metaphors such as networks, regions, or fluids (Mol & Law, 1994; Law, 1999; Latour, 2005; Sørensen, 2009).

The key insight in working with ANT as methodology is to not decide, at the outset of an inquiry, which actors to follow, which analytical concepts to apply, or how to apply them. The purpose in following the actors is to question who the actors might be, then generate questions about their actions and relations throughout the study. Only then can we consider how these questions might be answered - and if new theories are needed (Latour, 2005; Sørensen, 2009). Our use of social topology as an analytic device was suggested by questions we had about our experiences with the teachers, students and materials in this study. Here, we offer a new way of thinking topologically about curriculum making, by considering the shaping and dimensional effects of technologies, forms, and time.

Finally, a perhaps less well-known aspect of ANT methodology is to present a research text that puts the spotlight on the action. One of Latour's quality criterion for an ANT study is to ask, "Are the concepts of the actors allowed to be stronger than that of the analysts, or is it the analyst who is doing all the talking?" (Latour, 2005, p. 29). We invite readers to 'follow' our research story, presented as three enactments of one lesson that played out in our research sites as we – teachers, students, and researchers worked with this lesson. Each story is presented chronologically, an 'act' in the play as it unfolded, one research site at a time. To prepare for the discussion, we encourage readers to interpret the research as a play with the following questions in mind: Who are the actors in these curriculum making performances? And: Who or what is directing the action? We begin with the original script – the lesson design in QWILL.

3.5 The lesson design: “Seeing it my way”

Lois Burdett saw potential in the study of Shakespeare in the elementary grades to provide rich language, not only for learning the craft of writing, but for having something to write about – using Shakespeare’s plays and her adaptations as springboards for thinking deeply about the human condition. “Seeing it My Way” is a lesson intended to help students develop perspective-taking by considering this famous exchange:

Hermia – I would my father looked but with my eyes.

Theseus – Rather, your eyes must with his judgement look.

(A Midsummer Night’s Dream, Act 1, Scene 1)

The lesson begins with the teacher opening a file on an interactive whiteboard of a student’s drawing of Hermia and Theseus onstage displaying the quote. Students are invited to role play the parts of Hermia and Theseus, followed by a class discussion about the meaning of “judgement,” and what it means to “look but with my eyes.” Students are reminded through anchor charts on digital projectable files how to construct a ‘noteworthy’ narrative paragraph. Three samples of progressive student writing are available to collectively assess for their narrative qualities. In the samples, the text expands as the writer gradually adds details to a story about a child who is upset when her father turns down a request to rescue a sick horse. Each version includes more description of the context and how she felt. In the third and ‘best’ example, the writer includes the thoughts and feelings of the father: “For the first time I understood his feelings, for I was now seeing through my Dad’s eyes.” Self-portraits of the student illustrate each piece of writing, showing a change in facial expression from frowning to smiling. Students are now assigned the task of writing about a time when they wished someone would see things their way. In addition to the digital projectables, materials include printable graphic organizers, an assessment rubric, and a lined page for publishing the narrative paragraph. Each of these materials is titled “Seeing it My Way” in bold font. The graphic organizer and page for writing both contain the same prompt at the top: “In your narrative paragraph, write about a time when you wished a friend (or

your father, or mother, or someone else) ‘looked but with [your] eyes.’ Be sure to share your feelings as you tell your story.”

3.6 Act 1

The classroom is dark. The students’ gaze is drawn to the glowing figures of Hermia and Theseus, onstage, on the digital whiteboard. Mary is positioned at the back of the class, her video camera trained on the whiteboard, but ready to track the movements of the teacher, Rachel¹, and her 20 grade 5 students. They are seated in groups of 4 to 6 students, desks drawn together. The camera used captures a narrow field of vision, but affords the agility to move quickly as the action unfolds; to zoom in on patterns of student activity, to approach the scene from different angles, and to ask questions of Rachel and her students as they work. Rachel is positioned by the computer and whiteboard at the front of the class and remains there to advance and direct attention to the projectable files for most of this 90 minute language period. She leads the class through the lesson as described in QWILL’s Teacher Guide. Mary is impressed by the depth of discussion on the meanings of “judgement” and “point of view.” One student says, “Judgement means opinion, but strictly.” Rachel accepts this answer, “a strict opinion, I like that,” but here she goes off script to probe the class:

If I give you a judgement on your work, if I give it a grade – there’s a word that describes what I did – (hands shoot up, S – decided?) Yeah, I *decide*, I make a decision...So we know Hermia wishes [Egeus] could see things from her point of view, but (pointing to the word ‘Rather’ on screen) when we know *rather*, that means doing the opposite – what advice is Theseus trying to give her? Does she have to agree with her father’s judgement, or just accept it?

Rachel walks to a table at the side of the room and picks up a stack of papers.

¹ names of teachers and students are pseudonyms

So, what we're going to be exploring today, you're going to be writing about this topic...I know you've all had experience with this, I know you have a connection, where your parents have made a decision, or a judgement, (pause) and you *hate* it, and you're like, Oh! Why can't you understand from my point of view? (The students laugh and nod). All right, while I'm getting the next screen set up, you talk in your groups about a time when you wish your parents could see things from your point of view.

After 10 seconds of vigorous group discussion, Rachel refocuses the class, using another question prompt from QWILL designed to get the students thinking about empathy by first considering how they feel when a teacher doesn't see things their way, then how it might sometimes be useful to see things from the teacher's point of view. For this prompt, Rachel gives the example of a supply teacher. She is met with blank stares and silence. Finally, a student offers, "you could see how nobody's listening and you could see how this must suck." Rachel jumps on this:

There it is, so when you say, this must 'suck' for someone else, does anyone know what you are showing? It's one of those feeling, caring words we're supposed to be teaching you to be good at?

The students don't respond so Rachel starts spelling it out and making letter shapes with her body: E-M-P-A-T-H-Y. "What have we got?" The students chime in, "empathy!" Now Rachel is leading the students rapidly through the series of whiteboard anchor files on the elements of a 'noteworthy' narrative paragraph, moving forward and back through the writing samples about the father/daughter problem with the sick horse to analyze which one is "ok, better, best." Then she flips through the stapled pages of the writing organizer, rubric, and publishing page, pointing to features, telling the students to just begin with the planning today, and sets them to task by reading the prompt at the top of the page aloud. As the students begin working on their jot notes in the "Who, Where, When, What" boxes of the graphic organizer, Rachel and Mary begin circulating, watching. Rachel notices a problem and calls Mary over to show her how the boxes in the organizer are all of equal size, affording equal weight. She tells Mary she would redesign the "what" box twice as big, by moving the "where" and "when" boxes into one: "they are really about the story setting – they shouldn't all get equal play."

3.6.1 Act 1, Scene 2

Two weeks have passed, and Mary goes back to Rachel's classroom to pick up the completed writing samples. She is expecting to collect multiple samples of writing from each student that show a progression in their stories to take on more than one point of view, as the writing models on the projectable whiteboard files illustrated. To her surprise, she finds that the students have written one story from one perspective – their own. Rachel points out that the other materials provided by QWILL – the writing prompt and the assessment rubric, only ask for one story, and the focus of evaluation in the rubric is on the qualities of a narrative: "clearly and in an engaging way tells about an event and describes people, places, and/or things." As Rachel and Mary reflect on the writing produced by this lesson, Rachel points to the title of 'Seeing it My Way' on both the writing prompt and rubric, then pats the rubric and says: "There's not really anything in here about point of view. This is all marking the narrative aspect of it, not about the perspective or the empathy, it doesn't show up in here." Rachel has already described how she would begin to re-design the lesson by changing the writing organizer to give the narrative guts of the story "more weight." Looking back now, she adds that the story about the sick horse "went kind of dark," and says next time she would begin with a shared piece of writing, so she could control the tone of the story and model with the class how to shift to include other points of view.

At the end of act 1, we are introduced to the actors of technologies and forms. The configuration of the computer and the interactive whiteboard at the front of the classroom pinned Rachel to the front of the classroom and the students to a fixed gaze directed at the screen for most of the language period. The forms of the graphic organizer and the narrative writing rubric shaped what the students could write and directed what final content they would include, a story about 'seeing it my way,' despite the design of the lesson to incorporate another perspective into their personal narratives. Rachel alerted us to the fact that the assessment rubric was blocking the desired perspective-taking epistemology of the lesson, to experience and analyze the new, by keeping the focus on "the narrative aspect of it." The epistemic effect of the lesson was to account for the

known. At this point we suspected that the assessment rubric was more than an actor, but a director of the enactment of the lesson. While we remained interested in following the effects of technology, true to an ANT methodology, we decided to experiment with what we could control, a redesign of the writing organizer and assessment forms of the lesson, and a redirection of some of the content, to emphasize perspective-taking.

3.7 Act 2

Mary has been invited by a grade 4 teacher in a different school board to teach the “Seeing it My Way” lesson, by introducing some changes to the script based on the ending to Act 1. In this school board, teachers are encouraged to use Google Docs² for student writing to facilitate formative assessment by peers and teachers. In consultation with the research team, Mary and the teacher, Janice decide to elicit three samples of writing from each student by introducing pre and post lesson writing prompts, followed by individualized feedback through writing conferences (Calkins, Hartman & White, 2005). The writing prompt remains the same, to write about a time when someone did not see things your way; but the focus of the lesson places more emphasis on incorporating more details about the context and characters’ points of view, “to make it a better story.” The materials also change; the page for handwriting the story with the prompt on top is replaced by a prompt in Google Classroom that the students are able to open on their laptops. The students had approximately twenty minutes to begin their stories two days prior to Mary’s visit.

While Mary teaches the lesson, the students seem engaged by the opportunities to role-play the parts played by Theseus and Hermia, and to talk in small groups at their

² *Google Docs*, a tool within *Google Classroom*, is a digital document sharing and collaboration tool that allows multiple people to author, edit and format a Microsoft Word document at the same time.
<https://www.google.com/docs/about/>

worktables about what they wrote about in their first stories. When they are assigned to work on these stories some more, though, not everyone is happy to comply. Mary wondered if the difference in relations, in the students not wanting to ‘perform’ for an unknown teacher, meant they would invest less effort in this piece. Looking at the pre-post samples after the lesson, however, it seems that the students did in many cases make efforts to incorporate more context and detail into their narratives. But the evidence of a shift in point of view was not there. One student, who did appear engaged throughout the lesson and writing period, produced a version 2 that began: “This is the story of how *I* wanted it.” Using the affordances of font and images in Google Docs, she emphasised her point with italics and happy face emojis. Reviewing video footage of the lesson interactions and the writing samples later, Kelly-Ann wondered if the smiling face of the girl in the ‘best’ writing model on the whiteboard silently communicated to the students that their stories needed to have happy endings.

One piece of writing stood out to us, however. It did not have a happy ending, and it would not be evaluated well on its narrative elements: the story did not have a clear beginning, middle and end, it lacked details and interesting word choices, and it demonstrated no mastery of writing conventions. Yet it astounded us with its raw grasp of the lesson content. This author wrote about how it makes her sad when her father yells at her because she can’t read the simple, kindergarten level texts she is assigned for homework. She wrote that she understands her father loves her, but she hopes that one day, when she is older, she can choose to live only with her mother. This girl, one of the lowest literacy achievers in her class, according to Janice, connected with Hermia’s story. Hermia is a silent actor in this lesson too. As Rachel signaled to her students, Hermia isn’t afforded the opportunity to understand her father’s point of view, she has to accept it.

The difference in power relations between understanding another’s perspective, and having it forced upon you, remained an open question in all three lesson enactments. Perhaps that is why many of Janice’s students, when pushed to consider the other’s point

of view, were reluctant to relinquish the opportunity to write the “story of how *I* wanted it.” The student who couldn’t read or write a story that would measure up to the achievement defined by the rubric for narrative writing, however, bypassed the drive to simulate a performance of story-writing, or a performance of perspective taking. Instead, Hermia’s story for this student became a “stimulation” (Hargreaves, Earl, & Schmidt, 2002, p. 90), to identify with Hermia’s struggles and write about her own. In her story, we see performance in its ontological sense, as becoming (Barad, 2003) — not a simulation of perspective, but an achievement of it.

3.8 Act 3

At the conclusion of Act 2, although we tinkered with the lesson plan by introducing a pre-and post-lesson writing prompt, and although some of the material the students had available to them changed, we found with very few exceptions that the students continued to focus on their own perspective in their second writing sample. We hoped to continue observing this class, to study the feedback that Janice might give to these students to introduce a shift in perspective, but she needed to withdraw from the study. In the meantime, we were meeting with a third teacher about studying the QWILL program in her class, so we described what we had noticed so far and told her that we were interested in how she might redesign the lesson.

3.8.1 Act 3, Scene 2

In Acts 1 and 2, the action played out in a 100-minute language instruction block. Both Rachel and Janice were using the QWILL program two to three times per week as part of their literacy program. Sharon teaches a grade 5 French Immersion class, so she is using the QWILL program for her daily 40-minute English period. Act 3 begins with Sharon introducing the lesson in the same way, with the characters of Hermia and Theseus projected on the whiteboard. Sharon leads the class through a discussion of the meaning of the quote and elicits a variety of examples about situations where a student might need to look “through a teacher’s eyes,” or a teacher seeing something through a student’s

eyes. So far, the lesson is playing out as scripted. But it is the end of the day, so Sharon dismisses her class and asks if we can talk. She says:

I've looked over this lesson, and there's a problem with it. It's about writing a better narrative, not about making a *genuine shift* in perspective. I think in order to do this well, they need to write two stories, one from their point of view, and then another from the contrasting point of view. I also noticed in their discussions today that they are struggling to really look through my eyes – they can identify that I might feel sad or angry about a situation, but not *why* I feel that way.

Over the next 4 periods, Sharon has the students create a different organizer on a large sheet of paper to plan and write three stories: two stories about the same situation from contrasting points of view, and then a shared story. Before each writing session, she builds more modeling, discussion, and role play into the lesson.

On our final day of observation, the second writing sample is on the whiteboard. Sharon invites a few pairs of students to role play the dialogue between the girl, Lindsay, and her father. In this exchange, we know they do not agree on what to do about the sick horse, but not why the father does not want to rescue it. Sharon wants the students to fill in the blanks. One student role playing the father says, "We can't keep the horse, we don't have enough money." Sharon picks up on this point and emphasizes, "Now we get a little better information about the Dad's perspective, right?" and advances the whiteboard slide to the third writing model. Sharon reads aloud the dialogue in this paragraph between Lindsay and her father and then says:

Just like the conversations we role played, where two people's perspectives were included in a dialogue...in this paragraph, we see two people's perspectives, their ideas, being shared. And in the end – what does Lindsay say in the end? (Student) "She knows that her Dad really cares about Lindsay and doesn't want her to be sad when the horse dies?"

Sharon is pleased and assigns the third story to the class, reminding them to integrate the different perspectives from their first two stories into this final draft, using dialogue. As the students write, Sharon reflects with Mary at the back of the class.

Sharon: Ella actually had a beautifully eloquent answer, talking about things that weren't necessarily in the paragraph, she was taking a step beyond and saying that the girl realizes how much her Dad loves her, and how much he cares about her because he doesn't want her to go through this. So that's a step further, right?

Mary: That's right, it doesn't actually say, "I love you and this is why," but – she made that inference.

Sharon: Yes. She was able to take that and extend beyond. And that's true understanding. That's a true understanding of what empathy is, and perspective, so that's kind of neat.

Mary: Well, it's right back to the beginning, of the first lesson, where you said, they get the surface level of *how* somebody feels, but not *why*.

Sharon: Yeah, so that's a huge breakthrough.

Mary: And I don't think that if you had just gone, boom, boom [meaning running through the lesson, the writing models, and a rush to writing in a 100-minute period] that they would have got there.

3.9 Discussion

In this section, we discuss how relations between materials, space, and time gave dimension and shape to the classroom enactments of this lesson on perspective-taking, which produced similar effects in the first 2 'acts,' despite the tinkering of the human actors. Expectations and directions play a powerful role in a mentor curriculum. What signs did we – the teachers and the research team in Acts 1 and 2, fail to see?

Rachel had already pointed out to us in Act 1 how the forms of the graphic organizer and writing prompt gave less weight to the problems in the students' stories and less space to work it out, leading to superficial content. The writing prompt and graphic organizer also explicitly told students to tell a story 'seeing it my way,' despite the focus and examples in the lesson on developing two points of view. Tuning out the sound in video inquiry to attend to other modal resources helped the research team notice other material, spatial, and temporal action in the classrooms and trace the epistemic effects on the students and teachers. We observed that the material resources positioned the teachers and students in space/time and gave weight to their meaning-making. We noticed, for example, the silent

actor of Lindsay, the author of the writing models displayed on the whiteboard, changing her expression from sad to happy as her narrative changed, and wondered if her smiling face sent a message to the students that the best story would have a happy ending. Kelly-Ann's attention was drawn to how showing the three writing models in rapid succession might communicate a message about levels of writing, even though we took out the problematic rubric, graphic organizer, and lined page for a good copy in Act 2. We saw that in the 100-minute lessons in the first two acts, the teacher was positioned by the computer-driven whiteboard to be front and center, advancing the slides and directing the discussion, while the students were pinned to their seats, eyes directed to the screen. Although both Rachel and Mary built in break-out moments for student to student talk and movement, there was much more teacher talk than student interaction. Kathy commented on the pacing of the lesson, how it felt like a "rush to writing." Tuning out the sound allowed us to 'see' ways that spatial and temporal relations enact curriculum. In the third enactment, Sharon discerned the epistemic nature of the lesson: "It's about writing a better narrative, not about making a genuine shift in perspective," and redesigned the form of the lesson so that the construction of two "contrasting narratives" could come together in a shared story.

Tuning in to the audio and video data, we listened and watched for ways that the teachers designed and enacted curriculum with – and without their students. Kathy observed Rachel "going through the motions" to spell out 'empathy' and wondered if her use of sarcasm might communicate to her students that they were also about to go through the motions of seeming to care. Kelly-Ann saw that Mary used gaze and body language to "close the space" between her position at the front of the class, and a student sharing her story, creating a spotlight effect on this interaction for the whole class to observe. Mary commented that both she and Rachel felt exhausted at the end of the 100-minute block by the physical and mental effort of performing and directing the lesson. She also noticed that Sharon had the time to reflect and adapt, after a 40-minute period, based on how her students were responding: they could tell how she felt, but not why. In contrast with Mary and Rachel's performances, Sharon's was much more restrained, yet seemed more

attuned to her students. Sharon commented that “it only takes one of them to see” for the group’s understanding to shift, when a student answered a question in what Sharon described as a “breakthrough moment.” A genuine movement towards perspective-taking took shape in Act 3. The difference between performance as ‘going through the motions’ and ‘being in relation’ is what we noticed here. The space between design and enactment in curriculum making, intention and consequence, is reduced when we are closer to knowing our students, nearer to understanding all the social and material relations that bring us into being.

Why did the epistemology of the lesson not take a different shape until Act 3 of this lesson production? We thought we were redesigning the lesson in Act 2 by taking out the problematic organizer and rubric, which we felt put the weight of the thinking in the wrong places, in order to place more focus in the instruction on how to demonstrate multiple perspectives by writing a better narrative that included context and emotions. But we did not change the order of the slides, the general outline of the lesson, the writing prompt, or the amount of time for the lesson. The lesson as a form overall did not change, and most of the material actors remained – the production was intact. Further, even though we moved to replace the rubric with formative feedback, it seems we were still drawing students’ attention to levels of writing: low, medium, and high. Kelly-Ann, who was watching the lesson, noticed: “it felt like they were looking for differences in the screens in terms of what was going to count according to low, medium and high – but had moved away from the language of empathy or persuasion or point of view. It seems to remind the students that what matters is the achievement criteria.” As both Rachel and Sharon in Acts 1 and 3 showed us, this lesson in the end was never really about achieving a “genuine shift in perspective,” it was about how to achieve a good evaluation.

Curriculum scholar A.V. Kelly (2009) argues that “the forms of assessment and evaluation that are chosen will become the received curriculum” (p. 149). Although Kelly is referring to forms as different purposes of assessment, we extend our understanding of forms to also include the materials we use to assess, and the molds that

we put learning in. An attunement to materiality alerted us in this study to the direction that the assessment forms in this lesson were placing on its epistemic effects. We discerned by following this actor that assessment went beyond the rubric to the writing models and success criteria displayed on the whiteboard, projecting a performance of perspective-taking for students to simulate. However, we still had questions about the different enactments when we accounted for differences in the use of time and the effects of silent actors.

We understand that the human and material relations that enact curriculum mean that the same lesson design plays out similarly or differently between classroom productions. We find the relational metaphor of topology useful to explain this phenomenon in our study. Topology “focuses on whether and how the form of a figure (that is, the relations between its different points) is retained if it is bent, squeezed, etc., and whether and how shapes that in the end look completely different relate towards each other” (Decuyper & Simons, p. 374). In Acts 1 and 2, the form of the writing did not change because the relations between the actors, and the script they were following, were squeezed but did not essentially change. The spatial-temporalities afforded by the 100-minute period and the lesson materials projected on the screen positioned the teachers and students to act in ways that Hargreaves, Earl and Schmidt (2002) describe as simulations of learning rather than stimulations to learn. The shaping effect of time produced the form of “a rush to writing.” The design of space for writing, whether boxes on a page or fonts on a computer screen, gave dimension to some forms of meaning-making over others. Additionally, there were silent actors who were unaccounted for: Hermia and her desperate plea, Lindsay and her smiling face, and the students watching the teacher perform. These actors also produced “the story of how *I* wanted it.”

In the third enactment, Sharon did not stretch or squeeze the form of the lesson, she broke it. Instead of asking her students to follow Lindsay and write one story, three ways, she led them, through role play and reflection over a period of five days, to write three distinct stories. In the framework of learning by design, we can say that the epistemology

of the learning shifted in each story from experiencing the known, to experiencing the new, to critically applying new knowledge; the hardest shift to make (Cope and Kalantzis, 2015). Sharon had the insight that in order to truly ‘see’ the other, her students needed time and space to ‘become’ the other. We might say that empathy is the embodiment of another’s story.

3.10 Conclusion

This paper has reframed and expanded thinking about curriculum making. Curriculum making is a social practice governed by rules, and dependent upon institutions, educators and materials to come into existence. Adopting a sociomaterial approach in this study has shaped ways of seeing the routinized use of certain technologies, materials, and forms of assessment in various classroom contexts.

A ‘practice’ ... is a routinized type of behaviour which consists of several elements, interconnected to one another: forms of bodily activities, forms of mental activities, ‘things’ and their use, a background knowledge in the form of understanding, know how, states of emotion and motivational knowledge. A practice ... forms so to speak a ‘block’ whose existence necessarily depends on the existence and specific interconnectedness of these elements, and which cannot be reduced to any one of these single elements. (Reckwitz, 2002, pp. 249–250)

Practice is thus an assemblage of actors, and a sociomaterial approach to studying the practice of curriculum making directs our gaze in ways that allow us to deepen our attention to hidden actors: the unobservable, the unseen and the unvoiced. We set out in this study to explicitly “see double”: to observe the ways that teachers and materials are both designers of curriculum and enacted through curriculum making. However, our approach led us to see in more complex ways than these. The attention to social topology not only helped us to delineate and foreground acts of curriculum making as shaped through spatial, temporal, and material relations, but it also refracted back upon ourselves as researchers. We were prompted through this approach to question the role that our own methods, choices, selections and gaze played in forming what we saw.

Our research became a curriculum making inquiry that actively raised tensions, contradictions, and possibilities. Working collaboratively with methods of narrative, video and actor-network inquiries afforded multiple opportunities to question and re-vision the action under study. Teachers as curriculum designers can be intentional about organizing time/space/matter in a lesson to create epistemic effects but must also be prepared to see double: to discern when and how these materialities also design and enact curriculum. It might seem, from our study, that time was the most malleable form to work with. We experimented with how we used time within 100 or 40 minute blocks: where to invest it, how to pace activity and reflection. We suggest that the 40-minute blocks in Act 3 worked better for prolonging engagement with the learning goal of developing perspective-taking through narrative writing. It might seem that the 100-minute block of time assigned by QWILL is an arbitrary number, that Sharon's 40-minute period was her wise choice. However, in Ontario, these periods of time are recommended daily blocks for first and second language instruction (Ontario Literacy and Numeracy Secretariat, 2007; Ontario Ministry of Education, 2016). Time periods form routinized "practice blocks" (Reckwitz, 2002) that are more difficult to reshape when they are mapped onto larger topologies of school schedules and administrative policies.

Furthermore, we cannot ignore our ontological commitments (Clandinin & Murphy, 2009), as researchers with insider/outsider perspectives on classroom activity, in the curriculum making we participated in through periods of observation, experimentation, and reflection. Without us, would Sharon have taken the lesson apart in her otherwise busy day? Why did Rachel feel that empathy "is something we are supposed to be teaching you to be good at?" What made Kelly-Anne more sensitized to the effects of standard achievement levels than the elementary teachers in the study? Noticing how the actors of writing rubrics and achievement levels produced relations more likely to simulate empathy, than stimulations to achieve a different perspective, we are left wondering if everything we value in curriculum should be evaluated. Teachers make curriculum with students through the demands of student diversities, available and required material/technologies, school schedules, their own concerns, mandated programs

of study, and societal expectations. We must pause to consider what is possible and responsible to both teachers and students in these assemblages.

Ingold (2013) suggests that storytelling is the education of attention. Our research play in three acts might be read as a redemptive story, a familiar genre in education literature telling how an intervention saved students (Toohey et al., 2015). It might also be read as an evaluation of the original lesson design; alternatively, as a study of what got lost in translation as curriculum making shifted from text to context. But our concern has been how shifting forms of space, time, and material are also storytellers, silent directors of human attention, and intention. And in an era where we look to digital educational tools to salvage learner attention and foster creativity but continue to operate in frameworks that pre-specify products and measure performances, we ask how these forms shape our learning relationships. Recalling Hermia, and the student who empathized with the conflict with her father, Kelly-Ann questioned: “There is an authority to the teacher, and the ‘smartboard,’ and the materials. But surely students are the authors of their own stories. Where does that show up?”

Decuyper and Simons (2016) conclude that spatial arrangements direct flows of attention and power. How might we change the topology of the relations in the ‘Seeing it My Way’ lesson to position students, and our social imperative to develop empathy, center-stage? Teachers could begin with critical literacy, and closely examine the point Rachel touched on in Act 1, about the silent – and silencing – enactment of power: “Does Hermia have to understand her Father’s point of view, or just accept it?” As we saw in Act 3, teachers can break out of routinized forms of practice when they work to re-form the epistemic effects of material in a lesson design.

But we return to Connelly and Clandinin’s (1990) theorization of curriculum making as a shared storying of experience. As Rachel commented, Lindsay’s story “went kind of dark” – stories about conflict often do. We must ask ourselves how teachers and students *live* these stories (Connelly & Clandinin, 1990). Empathy and perspective taking are not just “what we’re supposed to be teaching you.” Hodges and Klein (2001) observe that

highly empathic people sometimes open themselves to abuse. Some of the students authored 'safe stories' about the pet they didn't get, or the hair cut they didn't want. However, many of the students wrote about troubles with their friends and family. In one enactment, we overheard students whispering about what they would or would not divulge. One child asked aloud, with concern, if these stories would be shared. Another asked her teacher privately if she should write about a certain issue. Knowing the family situation well, the teacher advised this student to talk to her mother about it instead. Empathy and true understanding can only be simulated in one-off lessons – it takes many forms of time and space for teachers and students to live these stories as they make curriculum together.

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Chapter 4

4 Assessment in 21st Century Learning: Improvisation and Inquiry

This chapter contributes a complex understanding of how formative assessment can support the practice of 21st century literacies. The study is situated in discourses of assessment for learning and 21st century learning in Ontario, Canada. Vignettes from narrative inquiries with four, junior elementary teachers explore different enactments of a literacy program, drawing on perspectives of teachers as curriculum makers and sociomaterial theories on practice and relational space. Findings present a conceptual framework of how practices for convergence or divergence in teacher improvisation and inquiry enact inferential, iterative, resonant, or fluid formative spaces for learning.

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4.1 Introduction

The practice of literacy education is highly complex now that digital and social media have multiplied resources for meaning making in multimodal, multilinear, multi-player ways (Rowse, 2016). As if that were not enough, the narrative driving 21st century learning reform goes something like this: Much of what kids learn today will be irrelevant by 2050 (Harari, 2018). What literacies are needed in the fluid world of the 21st century? And what practices of assessment will support what we don't yet know?

Formative assessment aspires to be assessment *for* learning when teachers have a pedagogy of seeking out data to provide feedback to students and to plan instruction (James, 2017). Assessment for learning promised to improve achievement by using real-time evidence about rich learning opportunities, an educational holy grail offered as an alternative to the impoverishing effects of externally sourced, standardized assessments

(William, 2017). In this approach to formative pedagogy, questions are a key source of data for teachers (Black & William, 2009; Heritage & Popham, 2013). However, assessment cannot be for learning if it is asking the wrong kinds of questions. As Delandshere (2002) points out, the first question to pose when seeking an answer to “what do students know?” is what it means to learn.

Thought leaders of the 21st century learning movement suggest that in an era of mass technological change and social disruption, students must develop cross-disciplinary competencies through inquiry-based learning so they can work critically, creatively, and collaboratively to solve complex problems (Fullan & Langworthy, 2013; OECD, n.d.). But the kinds of problems that matter, and what it means to be critical, to be creative, to work collaboratively, and to engage in inquiry, are open to question. For example, arts educator Margaret Latta and colleagues (Latta, Hanson, Ragoonaden, Briggs, & Middleton, 2017) studied how teachers enact cross-disciplinary learning in an education system undergoing 21st century reform. In this work, the authors define critical thinking as a competency for thinking creatively and rigorously. They discuss the need for open-ended inquiries allowing space and time for indeterminacy so that new forms of learning may emerge. The Organisation for Economic Development (OECD), on the other hand, has developed an assessment of collaborative problem-solving that engages students with artificial intelligence to solve a science problem in a scripted computer simulation (Griffin, McGraw & Care, 2012; OECD, 2017).

But from the standpoint of literacy education, teachers may wonder if the shift to the language of 21st century competencies is either an addendum to or a simplification of their already cross-disciplinary work. After all, in this study’s context of Ontario, Canada, the Language curriculum acknowledges that inquiry is at the core of all communication, and tasks teachers with developing competencies in literacy that will allow learners to work across subject disciplines (Ontario, 2006). Rather than beginning with assumptions about 21st century learning, then, this research seeks a better understanding of how

elementary teachers practice the complexities of literacy teaching and formative assessment in the 21st century.

The best way to understand how something works is to watch it being made. This project views teachers as curriculum makers, a commitment that will be explored further in the section on methodology. Four elementary teachers were provided online access to a literacy curriculum in development and asked to make changes in ways that made sense with the students, pedagogical influences, and technological resources in their classrooms. Drawing on vignettes and transcriptions of classroom activities and discussions, this chapter conceptualizes how the formative use of convergent and divergent questions makes different relational spaces for literacy practices. Metaphors of orchestration and improvisation from relevant literature on dialogic inquiry and teacher expertise are explored to illustrate these relationships. First, though, perspectives employed in this chapter on inquiry, practice, and relational space are introduced that can help educators engage with complexity.

4.2 Closed and open questions

Assessment *for* learning takes place within assumptions *about* learning. If these assumptions are not well understood, formative assessment will not improve learning, and may make things worse (Bennett, 2011; Wiliam, 2017; Shepard, Penuel, & Pelligrino, 2018). It is essential to ask what kinds of learning we value and how to recognize and foster these practices. Educators must also recognize that assumptions about learning are often in tension with each other. Even teachers who value formative assessment differ in their assessment mindsets (DeLuca, Coombs, & LaPointe-McEwan, 2019). For one thing, the growth mindset intended by formative assessment can be ambushed by the performance mindset of summative assessment (Pryor & Torrance, 1997). Standardized assessment pushes against innovative practice (Reznick & Shantz, 2017). Assessments developed out of classroom contexts rarely provide information that is useful in classroom contexts (Black & Wiliam, 1998). But when classroom assessment is situated within a regime of accountability assessment, effort goes to the measure with

the highest stakes (Delandshere, 2002; Reznick & Shantz, 2017). Most thinking about assessment stops here, picking sides in longstanding debates about assessment purposes. This is a problem, because the problem goes much deeper. Questions matter.

We can ask closed or open questions about learning. Pryor and Torrance (1997) describe this phenomenon as a matter of convergence or divergence. Asking, did my students do x? is a closed, yes/no question performing work converging to a standard. Asking the more open-ended question, what did my students do? enacts ongoing inquiry that could go in many directions. It matters HOW we ask what it means to know, because convergent and divergent questions perform different ways of knowing and being.

4.3 Knowledge as the practice of inquiry

The understanding that what we know is produced by the questions and apparatus of inquiry has been developed through studies in the philosophy and practice of science. The theoretical perspectives on inquiry and practice taken in this study draw on insights from Karen Barad, Ann Marie Mol, and Bruno Latour, scholars with influence(s) in diverse fields such as science and technology studies, feminist philosophy of science, queer theory, posthumanism, and actor network theory. What they have in common is the use of verbs such as *perform*, *enact*, and *assemble* to highlight the ongoing making of knowing through practice.

Barad (2007) draws on diffraction experiments in physics demonstrating how light performs as a wave or a particle, depending on experimental design, to theorize that the practice of inquiry performs matter. Some experiments also show that space and time are malleable relations performed with and even able to shape-shift matter. Accordingly, Barad describes phenomena as in a state of constant becoming, entangled with inquiry, a situated (but not necessarily localized) performance of *spacetime-mattering*. Educators can look at diffraction patterns in their practice to study how different questions perform different competencies, how the force of certain measures has effects on learning long after or a long way from their site of co-production, and how the spacetime-matter of

learners might become differently. Because it's not just particles that become differently under different conditions. Mol (2002) studies medical practice, demonstrating in a classic study of different ways of assessing one disease, that multiple versions of the disease are enacted with material consequences in patient bodies. It is not much of a stretch to suggest that teachers can learn from the implications of assessment in other professions. Latour (2005) describes practice as an *assemblage* to highlight the different kinds of work, or relations, done by agencies of space, time and material in assembling practice. Educators can ask questions about what participates in learning and what kinds of relations maintain a practice.

These perspectives share insights about the indeterminacy of knowledge, and the instability of definitions of who counts and what matters, which add much needed complexity and critique to the 21st century learning discourse seeking to respond to or profit from an indeterminate and unstable world. The terms perform, enact, and assemble can be interpreted synonymously in this chapter. But if it is helpful to think with distinctions, perform suggests the continual making of practice, enact reminds us that there can be multiple versions of a practice, and assemble draws attention to the agency of more than social actors in practice making.

4.4 Relational space

Mol and Latour's work in actor network theory has also been influential to researchers in education for thinking about the ways different assemblages enact different relational spaces. "Relational space" in this type of work is not only a social metaphor for ways people can relate to one another, as in the teacher-student relationship. More than social, relational space in a topographical, spacetime sense refers to the way that space is made through relations between actors (Mol & Law, 1994). Picture a spider web instead of a circle, or a folded map bringing the far near. Taking these sociomaterial insights about relational space, practice, and inquiry together, Pryor and Crossouard (2010) discuss the implications for designing relational spaces for convergent and divergent forms of learning:

Knowledge constantly has to be brought into being... it is not just a question of how a series of procedures or activities are sequenced. Pedagogic design in this sense is about enabling relational spaces, considering their temporal, spatial and social dimensions. (pp. 272-273)

Note the debate about sequencing learning activities in this quote. The idea of designing learning progressions is not a necessary feature of assessment for learning, but it is a pervasive one in the literature on formative assessment authored by experts in educational measurement (see Bennett, 2011 and Shepard, Penuel, & Pelligrino, 2018 for examples and debates). A planned progression of learning makes measuring the impact of formative assessment much simpler. Feedback can be scripted, larger effect sizes materialized, and the appearance of growth neatly visualized. But learning progressions have affordances for learning too. For example, when teachers are faced with the contingency of inquiry-based learning in mathematics, they can learn to anticipate responses in problem-solving to orchestrate a productive sequence of formative experiences (Smith & Stein, 2018). This study enters the conversation about learning design in assessment for learning by analyzing the formative relational spaces enacted through different pedagogies when teachers are offered an orchestrated score for literacy learning and invited to improvise.

4.5 Methodology

In order to understand how and why and with what the teachers made changes to the literacy program, the first author researched in these classrooms using methodologies of narrative inquiry (Clandinin, 2016) and actor network theory (Latour, 2005).

4.5.1 Field texts

Narrative inquiry (Clandinin, 2016) is an approach to researching experience that pursues meaning making with participants. As the researcher composes field texts such as notes, images, artifacts, and audio or visual recordings, they select texts that raise questions to share with participants in order to develop understandings about their meaning. However, material resources, spatial arrangements, and periods of time are also participants whose

roles should not be overlooked in understanding the relations that enact pedagogies (Ott, MacAlpine, & Hibbert, 2018). Actor network theory was also employed in this study as a methodology (Latour, 2005) for tracing the agency of space, time, and material in assembling practice. The first author used smartphone video recording as an accessible and relatively unobtrusive means of moving about the classrooms to document unfolding interactions between the teachers, students, and materials in use.

4.5.2 The literacy program

The Quality Writing in Literacy Learning (QWILL) curriculum is a set of digital resources formatted for use with an interactive whiteboard (IWB) and designed for junior elementary learners (8 to 12-year-olds; in Ontario students in grade five are generally age 10). The program materials include a projectable text of author Lois Burdett's (1997) adaptation for children of Shakespeare's play, "A Midsummer Night's Dream" and a teacher guide with activity suggestions and discussion questions about the characters, plot, and themes in the play (QWILL, 2014). The main literacy activities in this curriculum are shared reading (a whole class activity for reading and learning from a shared, mentor text), and oral and written responses (through group discussion and individual writing). This chapter focuses on the teachers' practices of formative assessment during collective activities such as shared reading and discussion, because the contingency of working formatively during group inquiry is often overlooked by the focus on providing feedback to students in assessment for learning (Black, 2015; Black & Wiliam, 2009).

QWILL was designed by Burdett based on her experiences as an elementary teacher in the 1990s, and the program developers recognized that this version of the program would need updates for the technological and pedagogical resources of classrooms today. This research study is part of a partnership development project between QWILL Media and Education Inc. and Western University to study literacy practices in 21st century learning. As part of this agreement, Western and the research team have no financial stake in the

program. Our interest is in what can be learned by studying teachers as curriculum makers.

4.5.3 Pedagogical narratives in curriculum making

The stories teachers live and tell about what they notice about learning and what they plan to do about it enact their curriculum making (Clandinin & Connelly, 1992). Clandinin (2016) discusses how she came to understand curriculum making as a confluence of meaning-making composed of school stories, which are the institutional milieu of meaning making that direct activity in classrooms, and teachers' and students' personal stories to live by. Similarly, Priestley, Biesta, and Robinson (2013) describe teacher agency in curriculum making as an interaction of personal and professional narratives of experience with the social, cultural and material ecology of school. In this study, rather than bracketing milieu from personal sources of curriculum making, or considering them as outside factors, we use the term *pedagogical narrative* to encompass all resources for meaning making, including assessment practices, which situate a teacher's approach to teaching and learning. Expectations in Ontario's language, science, and math curricula, professional development in inquiry-based learning (Campbell et al., 2018), and Ontario's framework for assessment and evaluation (2010) are sources of pedagogical narratives in this study. These programmatic and policy frameworks are resources for meaning the teachers lived and spoke about in the work of re-making teaching and assessment in the QWILL program. Importantly, the discussion in this chapter on orchestration and improvisation in pedagogy came about because these metaphors were key resources for meaning making for some of the teachers.

4.5.4 Participants

Four, grade five teachers in two schools and assenting students in their classrooms joined the study in January 2018. Although not a sampling decision in the study design, it happened that both schools were French immersion public elementary schools from a southwestern Ontario school district. Ontario's Ministry of Education funds and regulates French immersion schools with the same policies and accountability measures as regular

schools, with the exception that French is the language of instruction, and English is taught as a subject (Ontario, 2013). The teachers used the QWILL materials as part of their English language program approximately 100 minutes per week. Over a five-month period, the first author observed 40 hours of instruction across the four classrooms, and made over 500 field texts including video recordings, photos, and field notes about the lesson discussions and activities. The first author and teachers posed questions to each other about what they noticed during the lessons and in reflections after class with some of the field texts. The teachers provided insight into the instructional changes and decisions they made while using QWILL, both planned in advance and emerging formatively throughout the lesson.

The four teachers were female, white, mid-career teachers, typical for French immersion schools in this area. Known to each other by working in the same school or through professional development opportunities, they joined the study in snowball fashion. Each teacher's reasons for participating and ways of enacting the QWILL program were shaped by their different resources for meaning making about teaching language and literacy, reasons that will be explored further through the pedagogical narrative in each teacher's case. However, one resource they did share is the programmatic curriculum for language and literacy teaching in Ontario. For example, expectations for oral and reading comprehension in grade five include that students will learn to extend their ideas by making connections within and across texts, and that they can demonstrate comprehension by using evidence in texts to identify themes, summarize ideas, make inferences, and support arguments (Ontario, 2006, pp 97-98). Studying the same expectations for literacy enacted in different ways allowed the first author to observe pedagogies of formative assessment that created different relational spaces for literacy practices to emerge. These relational spaces are presented as cases of improvisation and inquiry in literacy curriculum making.

4.6 Cases of inquiry and improvisation

In this section on findings, vignettes and transcripts from classroom interactions and inquiry texts with the teachers are in italics. In transcriptions, the teachers are labeled as (T1, T2...) and the researcher is (R). Students are numbered (S1, S2...) to show turn-taking in discussions. While this chapter is formatted to follow style guidelines for writing in the third person, it is important to show in this section that narrative inquiry *is* personal. Researcher and participants are I, she, we, making meaning together. Each case begins with a brief summary of what can be learned about formative assessment through the inquiry with this teacher, followed by a descriptive vignette and further reflection on their pedagogical narrative.

4.6.1 Teacher 1: Improvisation for extending literacies

Teacher 1 used the orchestrated learning designs for print literacies in QWILL as a springboard for making a drama curriculum. The first point to highlight in this case is that the focus on improvisation in this study was inspired by teacher 1's practice of teaching improv skills as a way of extending language learning. It led the researcher to study other forms of improvisation across curriculum enactments. The next is that this teacher's pedagogical narrative about the "no-judgement zone" has implications for thinking about the kinds of feedback that create a divergent relational space for connecting ideas and contributing new ones in literacy practices. Finally, this case invites a more complex consideration of the way that assumptions about learning perform assessment intention and attention, than more formulaic discussions of formative and summative assessment can offer.

Teacher 1 is eager to participate in the research study because the QWILL literacy program is based on 'A Midsummer Night's Dream', and she has a background in theatre. She is intrigued by the idea of introducing her junior elementary students to Shakespeare. After she has reviewed the curriculum materials and lessons with the focus on writing, she decides to redesign the lessons to use in her drama program. Each drama period begins with a warm-up improv game. Desks are pushed against the walls and

everyone stands in a large circle. Today teacher 4 begins with a prop, an old straw broom. “This is not a broom,” she says, “it’s a microphone!” – and she pretends to sing into the broom before handing it to the next person. As each student takes a turn with the broom, it becomes a magic wand, a beard, a lollipop, a guitar. Sometimes a particularly apt transformation elicits laughter from the other students and an appreciative comment from the teacher. These reactions spur the next students to achieve a similar response. After everyone has had a turn, the teacher projects the QWILL adaptation of Shakespeare’s text on the classroom IWB and reads it dramatically for the students. It’s the part in Act 1, Scene 1 where Egeus, his daughter Hermia, and her two lovers argue before Duke Theseus about who she has the right to marry. Egeus has chosen Demetrius, but Hermia is in love with Lysander. In the QWILL lesson for this part of the story, students are to choose one of these characters and write letters to another character explaining their point of view. Today, teacher 1 asks the students to pair up and gives them a couple of minutes to choose two characters and plan a 30 second dialogue that will show their relationship and perspectives. While the pairs perform their dialogues for the class, she makes notes. A few days later, we meet to discuss my observations in her class so far.

R - One of the things I’m noticing in the French immersion classrooms using this program is that because it’s English, and English is the second language of instruction, is this interesting dynamic – and you can tell me if this is true for you or not - that this program is a bit of a ‘play space’ to build some richer connections that feed back into the French program and other subjects – it’s almost like this extra thing that you get to play around in but you don’t have to – is it right to say you don’t have to worry about it so much?

T1 -Yes, that’s it – because it’s a program that’s already been set out, so what I could worry about is, how am I going to take this and make it my own? To make it my own, I have to put the drama into it because that’s my passion. In terms of assessment, I do look at participation, when they do the partner acting, and I give them a quick scenario, I give

them a grade based on participation and also effort - can they become the character, take on that role. That's true of most drama assessments, what I would look for is can they develop a character and then keep the character going.

R - So I also asked you the other day about formative assessment – if you have places that you build that in?

T1- when we do the drama game warm up, that's my formative. I'll say things to them like "you did this really well, or that makes total sense, or that's great, or, really – I didn't see it that way" – kind of a reaction, it's not even a criticism, it's more of a response – none of them 'pass' when we do the warm up game, but sometimes when we're doing the readings or more formal acting, they'll pass [on their turn], so it's kind of interesting to see how they do when they see it as a game, or as a time when they are being judged...one of the major elements that I want to teach in a year, is that self-confidence piece.

R - And does that feed into the confidence to speak in French?

T1 - absolutely, the more confident you are in your first language, the more confidence you have to get up and be a performer in the second – we're just going to throw you up there, give us what you've got for 30 seconds – that's a no-judgement zone, and they are aware of that.

“Teaching confidence through improvisation in a no-judgement zone” is at the core of teacher 1’s pedagogical narrative. This pedagogy includes her personal interest in making a drama curriculum from the resources available in QWILL, her rationale for the learning experiences she plans, and her approach to assessment. Because teacher 1 believes that learning to improvise is important for building confidence in language, and she has noticed that students are more willing to improvise when they do not feel they are being formally evaluated, the formative assessment she provides is experienced as audience appreciation. Her pedagogical narrative about improvisation creates a relational space she calls “the no-judgement zone” for confidence to emerge. Her experience of freedom in

having a space to teach through her passion, which I called a “play space”, can also be called a space for improvisation. The invitation to improvise with literacy curriculum created room for teacher 1 to expand opportunities for students to build confidence through improvisation – a competency she believes supports oral literacy skills in first and second languages.

Praise is not supposed to be effective in formative assessment. Feedback that is not specific does not help students understand what they did well or how to improve (William, 2011). Praise can also make students believe that performance is valued over growth, leading them to avoid taking risks in learning that would push them further (Dweck, 2014). However, teachers are not just and not always teaching individuals. Teacher 1 is creating relational space for audience reflective practice through the improv game, in which she is part of a group appreciating a performance for its own sake. This crowd-sourced form of feedback is motivating to the group and distributed to the group. “They know that” the purpose of the game is to create a space for enjoying performance, more than evaluating performance.

This case also reveals how formative assessment can be conceptualized as acts of intention and attention, woven into the fabric of a teacher’s pedagogy. For teacher 1, assumptions about the relationship of improvisation to learning a language perform the way she notices participation, and the value (evaluation) she places on effort in creating and sustaining a role in drama. Teacher 1’s pedagogical approach to drama is more than an orchestrated sequence of learning activities in which moments of feedback and evaluation are added at scripted interludes, although she does plan some formative and summative assessment experiences. Her assumptions about learning enact what and how she notices.

4.6.2 Teacher 2: Improvisation with material

The vignette in this case demonstrates how teachers can use formative assessment during a lesson to improvise a new learning material This is the kind of contingent response

Black and Wiliam (2009) have in mind when they discuss the importance of classroom talk as data to make in the moment changes. The ability to work flexibly and responsively within a lesson structure is also widely regarded as a sign of teacher expertise (Sawyer, 2011). However, this case offers additional insight into two overlooked areas in the literatures on formative assessment and teacher expertise: first, the agency of materials and time as participants in pedagogy, and second, how a different source of meaning making about literacy education enacts relational space for a convergent kind of formative assessment.

Teacher 2 found out about the QWILL research study through her grade five colleagues. She is interested in what the orchestrated lesson plans and rich mentor text in the QWILL program can add to her pedagogical approach to literacy. Today's lesson is one of a series in QWILL called "Quoting the Bard," in which students engage with key themes in 'A Midsummer Night's Dream' through well-known quotes from Shakespeare's text. Teacher 2 has asked student volunteers to voice the characters as the class participates in shared reading, but they stumble over some of the vocabulary. She makes a snap decision: "Do you find it a little bit hard to understand...are there any words there - actually, I'm going to read Oberon's part first and then ask you to talk with your elbow partner about what those words mean." While the students discuss in pairs, teacher 2 quickly selects a screen snipping tool on the IWB, captures an area of text from the shared reading, pastes it into a Microsoft Word document, enlarges the text, and highlights several words in yellow. This takes just over a minute. Then she asks the students to put what Oberon is saying into their own words, using the context.

This case highlights the agency of technologies and time in lesson improvisation. The ability to capture, enlarge, and highlight material on the IWB afforded teacher 2 the opportunity to almost instantly create a new learning resource to clarify and extend her students' engagement with the text. The technology participated with her pedagogical strategy of using partner talk, performing time to make these changes. But what performed the need to improvise? Teacher 2's case also demonstrates the formative

assessment strategies of *sampling* and *inference* in managing the complexity of collective learning. However, impressive as this assemblage of teacher expertise with technological actors was in improvising a quick change in the lesson, I had questions about whether this approach to sampling and inference led to the best instructional decision.

Did teacher 2 have other experiences with this group of students to support her assumption that they needed more experiences with using context to support reading comprehension? How did she decide this was learning the whole class could benefit from, when perhaps time could be better spent with small groups or individuals on this literacy practice? I wondered if this formative moment of pedagogy was what Clandinin (2016) would call a school story, played out through teacher 2's pedagogical narrative. After another day of observation, I explored this idea with her further:

R - When you were going around today, everyone was contributing an idea, and I was wondering if you were picking up on that – because I know that finding evidence in the text is important to you.

T2 - Yes, finding evidence and themes, we work on that a lot.

R - There was a moment too at the beginning where you posed a question, and they didn't get it, and you said, "I want to answer that, but I think I'm going to wait."

T2 - I wanted to see if they would get it themselves from the context as we continued [the shared reading]).

R - Do you feel like they did?

T2 - I do, because I could hear little gasps, like, "Oh..." when I read that part. And I did repeat those two lines two or three times before continuing on. I think they got it, I wouldn't say all of them, but a good chunk.

The inquiry with teacher 2 uncovers the value she places on the literacy practice of “finding evidence and themes, we work on that a lot.” This pedagogical narrative performs the convergent formative assessment strategy of continual sampling for understanding that allows her to say: “I wouldn’t say all of them, but a good chunk.” It may be that teacher 2 has ample evidence from many other learning activities to support her inferences about group comprehension and vocabulary knowledge. However, the role of assumptions in what is valued in learning, the speed afforded by the agency of technology, and the relative silence of most of the students in this vignette raise questions for teachers to consider such as: What literacy practices are produced by what I attend to and attend with? And: Are my inferences coming from what I intend to happen, or what is actually happening?’ These formative assessment inquiries take longer to consider.

4.6.3 Teacher 3: Experimental inquiry

Teacher 3 has recent experience as an instructional coach. The school district has been focused on improving math scores on the province’s accountability test, and teachers are supported by instructional coaches, who in turn participate in professional learning communities about inquiry-based learning in math. Teacher 3 met one of the teachers who was using the QWILL program in a pilot phase of the study while she was coaching in that school. This year she returned to classroom teaching, invigorated with ideas about learning through inquiry and eager to participate in the research study. In contrast to teacher 2, this case explores how a more divergent, experimental approach to formative assessment performs a more fluid relational space for multiple literacy practices to emerge.

Teacher 3 and the students read aloud two exemplars of letter writing in a QWILL lesson where students write letters to Oberon giving him advice about how to resolve his conflict with Titania, and one of them has no punctuation. One of the goals of the lesson is to discern the value of writing conventions. Inspired by the looks of confusion as they try to read without punctuation marks, she improvises by leading the students in a moment to act out the feeling of confusion. This activity reminds teacher 3 of a novel by James Joyce

with no punctuation, and the students are curious about this. Once the students get to work on their letters, a boy comes to ask me if I know why James Joyce wanted to write a book with no punctuation. I say I don't know, but he can probably find audio clips online of Joyce reading aloud from the book, so we can at least find out what he wanted it to sound like. He goes back to his friends and tells them what he found out. Another student who has a computer for writing tries to look up audio of James Joyce reading from 'Finnegan's Wake.' After class Teacher 2 and I talk about the boy's question and she is impressed with his line of inquiry: "he's a student with D's and R's in language [failing grades] but what else do I know about him as a learner when I'm thinking about his report card?" I raise the question of how teachers can notice and use these unexpected moments formatively when they are supposed to be assessing standard literacy expectations, and she agrees it is a complex situation: "There's different levels of assessment – there's the concrete, and then so much more that's going on." Later we find time to sit down and talk about it more.

T3 – 'Formative assessment' I connect to the word 'experience.' Because I find that some students have an opportunity to show what they've learned if they feel like their thinking is valued and that they have a reason in class to think! ... So how is the learning being orchestrated in the classroom, so that the student develops a critical view of themselves and what's going on in the classroom? My assessment is, how does that student engage with the environment that I'm trying to create constantly – I don't even have a recipe for it, it depends on the topic... What are the overarching ideas in the curriculum, what are the students giving you and how are you able to capitalize on what they are giving you to fill those expectations.

R - That's what I'm curious about, when you have so much going on [during activity or discussion], what are teachers noticing, how are they, like you say, capitalizing on these moments?

T3- Some days I get it, some days I miss the boat. But I think as I get more experience in the classroom, I'm going to get better at capitalizing on those moments.

Teacher 3's pedagogical narrative is about seeing learning as inquiry and her role in teaching through inquiry to find the curriculum expectations in the students. As an instructional coach, she was given professional development on "orchestrating inquiry" in mathematics: "It's from a book about the five practices for orchestrating inquiry [Smith & Stein, 2018]." She told me this experience in studying opportunities for inquiry-based learning in math taught her to go slower and deeper in understanding her students: "but what do I know about him as a learner?" Although she referenced orchestrated inquiry, this vignette demonstrates a more fluid approach to improvising learning opportunities than the orchestrated designs for learning provided in the QWILL program. This fluidity comes from an experimental openness to participating with time, students and materials in assembling the learning experience. Time is of the essence here. Even so-called authentic approaches to classroom assessment such as documentation, learning portfolios, and performance-based assessment produce more simulations of learning than stimulus to learn when teachers and students are under pressure to deliver expectations (Hargreaves, Earl, & Schmidt, 2002). The more divergent assessment inquiry exercised by teacher 3 enacts relational space for indeterminacy and growth. The teacher's approach to formative assessment in this case is not, "the students got it," but rather, "some days I get it."

In these three cases, different moments of improvisation are explored as examples of formative assessment in literacy lessons. We demonstrate that these relational spacetimes for learning are performed by different assumptions about language and literacy learning, leading to divergent and convergent forms of practice. However, it could be argued that the teachers' pedagogical assumptions don't 'matter' as much as the different lesson designs in QWILL, which direct them to focus on specific literacy practices. Indeed, we have also studied how lesson materials enact relational space for learning (Ott, MacAlpine, & Hibbert, 2018). But the next two vignettes compare how two of the teachers enact the same lesson, to show how curriculum material itself is assembled differently through convergent and divergent questions.

4.6.4 Teacher 4: Dialogic inquiry

Like teacher 3, teacher 4 has participated in some professional development about inquiry-based learning. Similar to teacher 1, she has an interest in drama-based approaches to teaching language and literacy through some experience in community theatre productions. And teacher 4's interest in participating in this research study is inspired, like teacher 2, by the value a mentor text and a mentor curriculum might add to her approach to teaching English, given the limited amount of time available for planning and assessing this subject in the French Immersion program. We might expect her enactment of the QWILL literacy program to be the same as or a blend of the other teachers' pedagogical resources for meaning making. When we compare how she teaches the same lesson as teacher 1, however, we see a different relational space emerge through dialogic inquiry and discern how lesson materials can be assembled formatively.

Students in teacher 4's class are participating in a discussion about the social hierarchy of Elizabethan society that will help them understand the characters' roles in the play, using a graphic organizer from QWILL projected on the IWB called the "Social Pyramid." As she orchestrates the discussion, teacher 4 moves about the room, looking for different student responses. Then she asks the students about the words describing characters in the different levels. The students go off on a tangent when they think that 'tradesmen' means people who sell or trade items. But instead of correcting them, T pauses for a moment, consults her notes from the teacher guide and then says: "we need to think a little bit more..." The following is a transcript of this part of the discussion, which lasted 11 minutes.

S1 - A master tradesman would travel around and sell stuff to people and be really good at persuading them

T - Oh, if you were on the road and selling things, would you be a tradesman?

S2- You trade, like I'll give you a piece of corn for that onion, and he would give them something overpriced, and they would give him something really good

T (consulting her notes from QWILL teacher guide): We need to think a little bit more about what a merchant would be and what a tradesman would be. When you think of tradespeople today, what do you think of?

S3- A tradesperson would be in one spot, and a merchant would be on the road.

T- Not quite. Are you people getting confused by the word 'trade,' like trading back and forth? You need to be careful; a tradesperson may have something to trade, but not in that way

S4 Oh!

S5 - Maybe they would trade a service for something

T – Not really, no. (To class): What do you associate with the word merchant?

S3- A merchant has cool stuff and sells things

T - Ok, so they sell things. Where do they get the things to sell?

S6 - From the mine or something?

*T - I like what you said, but I'll give another hint. The merchant wouldn't **craft** what they sell.*

S7- They hire people to make it for them.

T - So a merchant would ...

S3 - Buy things so they can sell them

T-Now this should lead us into what S7 was talking about, what is a tradesman? Talk to someone beside you about that (short interlude for discussion at student desk groupings) ...ok, what is a tradesman?

S8 - It's not something bad that you give them, it's like I'm asking for this, will you give me that

T- We're getting confused by the word trade again. The people who make things for the merchants to sell have to do what?

S9- Crafting them?

T- Right, they are crafting them. So, it's like a relationship, the tradespeople are making the stuff and the merchants are buying and selling the things. Now that we know what a merchant is and what a tradesman is, what is the difference between level 2 and level 3 in the social pyramid?

This discussion-based inquiry took 11 minutes, not only because 9 students posed possible answers, but because the teacher paused to reflect on each answer before responding, and also created an opportunity for all the students to discuss between one another. I asked teacher 4 about what I noticed here about the relation of inquiry to time. She replied that as a second language teacher, she is used to giving students more time to respond and also giving more students opportunities to respond:

T4 - In a French Immersion school, they need time to process the question 2 or 3 times before answering it. The processing time is where the learning happens. When a question is asked, we immediately want to answer it –why not let them open that file in their brains?

Like teacher 3, teacher 4's pedagogical narrative for teaching language is also about inquiry, but through a different set of relations. Rather than being open to shifting the focus of a learning opportunity, teacher 4 practices an iterative cycle of circling around a question, providing opportunities for a collective understanding to emerge through discussion. This iterative practice makes spacetime to reflect on student responses in order to promote further thinking. The material of the QWILL social pyramid is assembled through the discussion not as a static learning prop for visualizing hierarchy,

but as a formative object, an emergent engagement for assessing understanding: “Now that we know...what is the difference between level 2 and level 3 in the social pyramid?” In teacher 4’s pedagogical narrative, the path to learning through inquiry is to provide iterative opportunities for students to practice making observations before forming conclusions.

The relational space enacted by formative assessment in the case of teacher 4 may be the closest example in this study to the kind of orchestrated dialogic inquiry conceptualized by Mercer, Hennessey, and Warwick (2010), in which a teacher acts as conductor and the students perform as ensemble, collectively building towards an understanding. It may also seem the least improvisational of the four cases presented here in the way she worked with the lesson design and materials as laid out in QWILL. But there was spacetime matter performed by improvisation that becomes more apparent after contrasting this assemblage of learning with the version enacted in teacher 1’s classroom:

Teacher 1 stands at the IWB, speaking quickly, directing attention to the visual model of the social pyramid, pointing out the size of the social demographic layers and connecting this to the notion of hierarchy in government the class learned about in the grade five curriculum for Social Studies. When she asks about the tradesmen, the students get into the same problem as teacher 4’s class, associating trading with sales. Teacher 1 takes two wrong answers, elicits a third from a student she thinks might have the right one, then intervenes: “I appreciate that everyone has used their contextual knowledge, but in this case, tradesman means someone who makes his own craft.”

R - Something that’s a recurring theme that you bring up with the kids all the time is the theme of ‘connections’, I wanted to ask you about that.

T1 - That’s one of the things we’ve been working on for this entire year, because that’s part of our language program, making connections is a huge element. Finding themes is really big this year, as well as making connections to other texts – life stories, things that you’ve read, the news, movies – that’s a big element: have you heard this phrasing, this

expression before, how can we use this in our own work, our own studies: so we talked about the social pyramid, that's similar to what we talked about when we did government earlier this year.

4.6.5 Assembling formative material

A quick glance into the classrooms during these two examples of teaching QWILL's lesson on Elizabethan social hierarchy looks much the same. Both classes have an IWB displaying the same visual model at the front of the room, both have similar numbers of students grouped in small clusters of desks, and both teachers are asking similar questions in the same sequence, an orchestrated design for learning provided by the QWILL teacher guide for the lesson. On closer observation, the assemblages of questions, material, students, and teachers reveal strikingly different relational spaces. This is why Pryor and Crossouard (2010) say that pedagogy is about more than designing a sequence of learning experiences, it is about understanding how relations between spatial, temporal, and social actors assemble different knowledge practices.

The ways that time is used for iterative inquiry creates an improvisational space for teacher 4 to reflect in the moment and redirect the discussion multiple times. Her movement around the room and pauses to bring many students into the conversation assembles space for "processing time." The material performed by her pedagogical narrative of making spacetime to observe before coming to conclusions is the social pyramid graphic assembled as a formative practice.

On the other hand, the spacetime-material relations in teacher 1's lesson enact the social pyramid as more or less pre-assembled – a few quick gestures and a brief exchange of question and answers reveals its shape and purpose. Hierarchy is not a concept to be assembled through the pyramid, it is a concept to be connected to. Teacher 1 "appreciates when you use your contextual knowledge" – in other words, she attends to and values and creates spacetime for students to make their own connections within and across texts and disciplines. Her pedagogical narrative for literacy is about making connections so that

students can build richer practices or create new ones: “what can we use this for.” The social pyramid came pre-assembled in teacher 1’s lesson so it could be used as a tool for making connections. Following the quick introduction, teacher 1 gave the students in desk groups two minutes to pool their background knowledge to decide on and perform actions that would demonstrate the work and social position of the characters in the play.

The difference between how teacher 4 improvised with the social pyramid graphic, making it a formative material for inquiry, and how teacher 1 used the pyramid as a connection device for further improvisations, illustrate what Mol (2002) describes as the difference between knowledge in the making and a knowledge object. A knowledge object blackboxes the inquiry that goes into assembling this knowledge, so that the object can be put to work. Analyzing how the social pyramid is enacted differently in these two classrooms unpacks the complex agency of the teachers’ pedagogical resources for meaning making in assembling curriculum material as formative practice in a convergent relational space, or as a connection device to a divergent practice.

The following discussion looks across the four cases to conceptualize the importance of making different relational spaces for 21st century learning. Spatial metaphors are provided as a framework for helping teachers think about the ways their pedagogical resources for meaning making and convergent or divergent formative assessment practices assemble relational space for literacy practices. Since orchestration and improvisation were resources for some of the meaning making in these teachers’ enactments of inquiry-based learning, we begin the discussion by bringing the literature on orchestrated inquiry into conversation with the literature on improvisation in teacher expertise.

4.7 Discussion: Orchestration and Improvisation

One of the 21st century competencies deemed of highest importance for life-long learning in a global knowledge economy is the ability to learn through collaborative inquiry

(Campbell et al., 2018; Fullan & Langworthy, 2013; Griffin, McGraw, & Care, 2012; OECD, 2017).

There is a body of research about developing strategies for *dialogic inquiry*, defined as “a pedagogy of orchestrating classroom talk and activity so that teachers and learners are actively commenting and building on each other’s ideas, together posing questions and co-constructing interpretations” (Mercer, Hennessey, & Warwick, 2010, p. 198). Much of the context for this work centers on orchestrating inquiry in science in elementary and secondary education, using scripted approaches to formative feedback that can be encoded in software (Littleton, Scanlon, & Sharples, 2012) or developed adaptively through artificial intelligence (Tissenbaum & Slotta, 2019). The metaphor of orchestration has also been used to weave together formative practices for inquiry learning in mathematics (Stein, Engle, Smith, & Hughes, 2008).

4.7.1 Teacher as orchestra conductor

Orchestration is an inviting metaphor for thinking about the complexity of the teacher’s role in organizing collective activity and knowledge production through inquiry-based learning (Littleton, Scanlon, & Sharples, 2012). Teachers can see themselves as composers, designing an orchestration as a sequence of harmonious learning activities that lead to a finale (Forman & Ansell, 2002). They can also see themselves as conductors, prepared with an orchestrated score so they can skillfully weave in different ensemble members and instruments at the right time (Scanlon, Anastopoulou, & Kerawalla, 2012). Conductors must know the score and the ensemble well so they can anticipate performances and bring the best out of them (Stein et al., 2008).

Orchestration appears to work well as a pedagogical metaphor for inquiry-based practices that converge on a known conclusion. For example, convergent literacy practices ask if students can make correct inferences based on evidence in a text, understand vocabulary, or write a paragraph demonstrating they comprehend a text. Orchestrated sequences of learning activities culminating in solo performances can answer these questions. But the

problem this chapter addresses is how teachers make sense of the noise before the solo performance, when it is emerging through the ensemble. How do teachers work with inquiry formatively?

4.7.2 Disciplined improvisation

Sometimes, if an ensemble is well-practiced, the conductor can slip out of role and perform as part of the ensemble. In situations of repertoire, there is room for improvising with the score. There is a tradition of studying expertise in teacher education which has to do with the ability to improvise (for review, see Sawyer, 2011). Sawyer (2004, 2011) defines *disciplined improvisation* as the artful balance of creativity and structure in teaching. The expertise of improvisation in teaching is associated with knowing subject and students well enough to anticipate responses, and in having a well-rehearsed stock of pedagogical strategies at the ready to respond contingently (Barker & Borko, 2011). Studies of improvisation in teacher pedagogy draw analogies from studies of improvisation in conversation analysis, music, and theatre (Holdhus et al., 2016).

According to Erikson (2011), all real-time communication is essentially improvisational; in teaching, the curriculum is a theme and what happens in the classroom is a variation. But artful improvisation in music and theatre comes down to two kinds of disciplined practice: practicing a standard repertoire well enough to play with, as in jazz (Sawyer, 2011), and having an ensemble that is well-practiced at listening and responding, as in theatre improv (Sawyer, 2004). It is easy to see how repertoire for teaching strategies and listening translate well to working with/in a classroom learning ensemble. We suggest that disciplined improvisation is also a rich metaphor for thinking in more complex ways about how convergent and divergent inquiries assemble inferential, iterative, resonant, or fluid repertoire space for literacies. Assemblages are repertoire for language in practice (Pennycook, 2017).

Teacher 1 and 3 practiced more improvisation *on* the QWILL program as they experimented with its orchestrated designs for learning. Their divergent practices perform

resonant space for the literacy practice of making connections, and fluid space for experimental inquiries into what it means to be literate. Teacher 2 and 4, on the other hand, created space for improvisation *within* the orchestrated arrangement of QWILL to provide formative experiences through convergent literacy practices. Their pedagogical narratives of finding evidence in the text and making careful observations on the way to conclusions led to inferential and iterative spaces for circling around to check for understanding and cycling back to grow understanding. Figure 3 provides a visual organizer of convergent and divergent literacy practices, associated pedagogies, and implications for disciplined improvisation within these formative relational spaces.







Literacy Practice	Form of Inquiry	Formative Pedagogy	Relational Space	Disciplined Improvisation
Finding Evidence	Convergent 	Checking for Understanding	 Inferential	Teachers practice improvisation within orchestrated learning designs using pedagogical repertoire and attentive listening.
Forming Conclusions		Building Understanding	 Iterative	
Making Connections	Divergent 	Appreciative	 Resonant	Students practice repertoire for openness to new ideas, posing questions and attentive listening.
Making New Practice		Experimental	 Fluid	Teachers practice inquiry about learning. Students try new practices.

Figure 3: Formative Space for Learning

4.7.3 Disciplined improvisation in formative pedagogies

In cases where learning is orchestrated as a sequenced learning progression that converges to a standard practice, it may help teachers to see improvisation as a small riff

on the score, a spacetime to work formatively. The vignettes of teacher 2 and 4 demonstrate how pedagogical repertoire can perform new time signatures in the orchestration – small pauses that enact moments of improvisation, such as the processing time teacher 4 was enacting, and the material teacher 2 decided to assemble for learning. In both cases, the pedagogical narratives of these teachers contain the meaning-making device of convergence. Teacher 2's pedagogy for literacy is about designing experiences for students to find evidence in texts. Teacher 4's pedagogy for literacy is about language as inquiry. Inquiry for her means making time for careful observation and discernment before coming to conclusions. We can argue that teacher 4's practice is more aligned with the 21st century discourse of learning to inquire than providing the 'right' answer. Ontario's language and literacy curriculum has not been updated since 2006. However, both kinds of literacy practices converge on a known destination. Designing learning experiences for convergent literacy practices might be described in similar terms to orchestrating inquiry for math and science learning. Convergent improvisation is a way to talk about creating riffs in the spacetime of an orchestrated lesson plan to make room for formative assessment. The pedagogical relations in teacher 2's class perform an inferential relational space of sampling around the room for individual understanding and making generalized observations to improvise new learning objects. In teacher 4's classroom, the pedagogical relations look like an iterative cycle, formatively assembling curriculum material by guiding responses through dialogical inquiry to build a collective understanding.

But there is also value in seeing improvisation as a divergent practice of playful experimentation, where the learning can go in unanticipated directions, both teachers and students have room to improvise, and new forms of practice are composed. The cases of teacher 1 and 3 illustrate how pedagogical narratives that practice divergent improvisation lead to the emergence of new literacy practices. For teacher 1, using QWILL was an opportunity to translate a curriculum that converges on forms of writing into a more open-ended, drama-based curriculum. Within this improvised curriculum, Teacher 1's formative pedagogy of appreciative observation performed relational space

as a “no-judgement zone” for students to practice extending their ideas and contributing new ideas. This is not to say that careful planning and observation did not take place. The class has a repertoire for “making connections,” and for “developing confidence through improvisation” that teacher 1 develops with the class ensemble over time. The students practiced openness to making new connections to the literacies being practiced, whether they were suggesting ideas for writing a class adaptation of “A Midsummer Night’s Dream,” posing their own questions during shared reading of the play, or connecting their life worlds to their dramatic re-enactments. The pedagogical relations that practice literacy in teacher 1’s classroom form a resonant space. Sørensen (2009) describes resonant space as an assemblage in which a practice materializes from a central point and causes others nearby to practice in attunement with the center.

Teacher 3 valued the research opportunity to experiment with the QWILL curriculum. In this inquiry space disciplined improvisation happened as tinkering before learning and reflective adjustments after learning, leaving spacetime in the experiment for participatory observation. Because teacher 3’s pedagogical narrative is about finding expectations *in* her students, literacy practices took longer to appear stabilized. Lessons sometimes went in unanticipated directions, following the students’ lead, as in the case of “the book with no punctuation.” The pedagogical relations practicing literacy in teacher 3’s classroom look more like a fluid space. Sørensen (2009), drawing from Mol and Law’s (1994) analogy of fluidity in practice, describes a fluid assemblage as one looking more like a puddle after rain. Some of the rainwater may fall as droplets close to the puddle. They might be absorbed into the practice puddle, and they might not. It might seem in more fluid, indeterminate pedagogical spaces, that literacy practices are not improving, that assessment for learning is not happening. Feedback, after all, is about the expected.

Formative assessment of the unexpected is a disciplined improvisation that requires being attuned to opportunities to learn new things about students: “He’s a student with D’s and R’s in language, but what do I know about him [in this spacetime] as a learner?” Teacher

3 improvises spacetime for conducting inquiries into who her students are as learners, and how to create new or richer experiences for learning in her curriculum-making.

Assessment in this improvisational, fluid, and indeterminate space is assessment *as* inquiry. This does not mean that teachers and students do not work towards standards of practice. At the time we had this conversation in May, Teacher 3 was thinking ahead to writing report cards. She soon after ended the research experience in QWILL so she could put her findings into action. But there was value in this teacher making time to practice divergent assessment inquiries in order to bring new knowledge about her students into being.

4.8 Conclusion

Assessment is not just *for* learning, it is *in* learning. It is in what we (the grand ‘we’ of teachers and students in a learning situation) intend and attend to. Assessment is the *received curriculum* (Kelly, 2009, p. 148). This chapter considers the performative role of assessment in learning, broadly considered as closed and open questions about what it means to learn, and what is valued in practice. The study explored curriculum making in elementary classrooms to better understand the literacy and formative assessment practices that can support cross-disciplinary, inquiry-based learning in the 21st century. We found that teachers enact the same literacy program differently as their assumptions and resources for meaning making about language and literacy perform different formative pedagogies. Convergent, ‘yes/no’ questions that lead to a known conclusion perform the inferential and iterative spaces needed to support the cross-disciplinary competencies of finding evidence to support an argument, making careful observations, and reasoning with texts. More divergent, ‘yes-and’ questions performing resonant and fluid formative space are also needed to give room for learners to make connections leading to new ideas, and to make time for posing different questions. Literacies are multiple practices for performing meaning across disciplines.

The metaphor of disciplined improvisation, calling to mind the need for a well-rehearsed repertoire of strategies for sustaining group inquiry and an attentive ear for responding

flexibly to complex, collective learning situations offers insight to the problem Black and Wiliam (2009) posed about how teachers can work formatively in moments of contingency. It might be that the teachers in this study had well-tuned ears because as second-language teachers, they did not take first language learning for granted. In the cases of teacher 2 and 4, we see repertoire for checking for understanding, iterative knowledge building, and assembling learning materials formatively through classroom discussions. These convergent yet improvisational pedagogies demonstrate formative assessment practices all literacy teachers can learn from.

However, as teacher 3 said, “in assessment there’s the concrete, and then so much more.” The idea of improvisation as a “play space” can also be a disciplined approach to formative assessment. In this study, the teachers expressed more freedom to play with their curriculum making when teaching English because they faced more accountability to focus on concrete literacy expectations in French. All teachers might learn to value making spacetime within their curriculum making for *assessment as inquiry*— playful, experimental, open questions about who students are and might become as learners. The notion that improvisation is only for experts needs to be challenged. A principled approach to improvisation in teacher education seeks opportunities for teachers from the earliest moments in the profession to research their practice in ways that re-vision possibilities for social justice (Philip, 2019). Literacy educators can also imagine how literacy practices might be extended, enriched, and even destabilized in more fluid formative spaces so that new practices can emerge.

Finally, in order to practice assessment that supports complexity in 21st century learning, educators must speak back to testing of standard expectations with arguments for validity. Accountability measures perform a failing system, if the measures fail to ask the right questions about performance. This study does not suggest that standards in literacy practice are not important, but it does show they are unstable. If we value literacies for creativity, critical thinking, problem-solving, and collaboration, then we must accommodate the resonate and fluid relational spaces that foster creative, risk-taking,

disruptive “why not” and “what if” practices, alongside the iterative and inferential spaces that support problem-solving and logical reasoning. Assessment in 21st century literacy curriculum making requires divergent and convergent practices of improvisation and inquiry to enact formative spaces for learning.

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Chapter 5

5 Magic and Monsters: Collaborating with Google in 21st Century Literacies

The 21st century learning narrative about teaching skills for collaboration forms the backdrop to this paper, in which we pose a playful question to explore a complex problem: How might elementary teachers care for the monsters made when students collaborate with Google in literacy practices? Two cases of curriculum making with collaborative literacies show how these practices are ‘more-than.’ We discuss how theories of im/material practice that engage with affect, effect, and complexity can inform how teachers care for the magic and monsters in 21st century literacies.

5.1 Prologue: 21st Century Collaboration

“We’re all going to be on the same page, because you need to learn how to work as a team.”³

It is generally accepted that young people need to be taught how to collaborate to maximize the value of working and learning together (Blatchford et al., 2003; Gillies, 2016; van Leeuwen & Janssen, 2019). But what does it mean to collaborate in the 21st century? With whom or what do we collaborate and to what effects? In a world increasingly coordinated with and by digital technologies and artificial intelligences, some anticipate that what counts as knowledge and work today may not disappear, but will become irrelevant (Harari, 2018). This is the fear and profit motivation embedded in

³ Ava, teacher participant (participant names are pseudonyms)

the narrative on 21st century learning promoted by the Organisation for Economic Development and Cooperation (OECD):

It is about how knowledge is generated and applied, about shifts in ways of doing business, of managing the workplace or linking producers and consumers, and becoming quite a different student from the kind that dominated the 20th century. What we learn, the way we learn it, and how we are taught is changing... The more interdependent the world becomes, the more collaborators and orchestrators must step in. (Schleicher, 2013, n.p.)

What matters, in this 21st century learning story, are so-called transferable skills such as collaboration that can help global citizens work together to solve complex problems. But there seem to be some other shadowy collaborators, waiting in the wings to step in and save education systems stuck in the 20th century.

5.2 Introduction: Collaborators

This study is part of a broader research collaboration on literacy assessment and curriculum making in the 21st century (Ott, MacAlpine, & Hibbert, 2018; Ott, 2020, Ott & Hibbert, 2020). Our first collaborator in this SSHRC Partnership Development project is QWILL Media and Education, Incorporated. QWILL (Quality Writing in Literacy Learning) gave us online access to a prototype literacy program for junior elementary (grade 4 to 6) classrooms based on author Lois Burdett's (1997) adaptation for children of Shakespeare's play, "A Midsummer Night's Dream" (QWILL, 2014) in order to study what teachers would make of it with the technologies and resources available today. The SSHRC study was framed as a critical engagement with the question posed by the (mostly) private-public partnership of Canadians for 21st century learning and innovation (C21): "What if we could harness the digital tools of today's world to provide higher quality learning experiences and opportunities for our children?" (C21, 2012, p. 3). Why not, indeed? After all, the 21st century learning movement is also energized by educators who recognize that digital practices offer young people opportunities for engaging learning experiences and future employment (Pangrazio, 2016). From this standpoint, digital literacies have affordances for students' multiliteracies (Cope & Kalantzis, 2015),

leveraging their interests and abilities in online practices and the use of screen-based applications (apps) on laptops, tablets, and smartphones.

But our starting point for undertaking this research was an understanding that teachers and students are curriculum makers (Clandinin & Connelly, 1992). Rather than taking concepts such as 21st century learning, digital literacies, and collaboration at face value, we sought to understand *how literacies are practiced in elementary classrooms in the 21st century* (Ott, MacAlpine, & Hibbert, 2018; Ott & Hibbert, 2020). This approach signals our theoretical posture in literacy research: we agree with Cannon, Potter, and Burn (2018) that separating out the digital as either an elevated or marginalized type of literacy obfuscates both the dominance of the screen in 21st century life, and the dynamism of literacies as always multimodal and emergent practices. We define literacies in the broadest sense, like Perry (2020), as “the practices that facilitate how we engage with the world and how we come to be in and with the world” (p. 2). We explored how elementary teachers and students practiced literacies in the 21st century by inviting them to re-design the QWILL literacy program based on Shakespeare’s play while we “followed the actors” (Latour, 2005, p. 68). And we found ourselves often following the actors of Google Apps and Chromebooks as students worked collaboratively on various tasks.

Using characters from the world of Shakespeare’s play as monster metaphors, we describe the mayhem, mutation, and magic that ensues, embodies, and escapes from curriculum making. This introduction presages much about our theoretical perspectives and methodological choices. Before unpacking them further, we look more closely at why studying monsters in literacy practices with Google matters.

5.2.1 Google in education

It doesn’t take much digging into the 21st century learning movement to unravel its corporate commitments and collaborators in surveillance capitalism (Williamson, 2017). In 2013, C21 published their intent: “We see the possibilities in many individual schools

and classrooms—where personalization of the curriculum is the natural outgrowth of students’ interests and aptitudes” (C21, 2013, foreword). Scroll through the list of C21 partners and Microsoft Canada figures prominently. Mass data platforms such as Google and Microsoft are in education for the clicks (Dessoiff, 2010). In 2006, an arms race of sorts began in North American school districts to offer ‘free’ suites of corporate-branded products and services. For some time, it seemed that Google was winning, as it first made an end-run around educational administrators to recruit teachers directly as brand ambassadors through its Google Educator program, then found a new market for the struggling Chromebook by packaging it for education systems (Singer, 2017). Google now faces increased competition from Microsoft in its Office 365 applications for education such as Outlook for email and the Class Notebook feature in OneNote (school board administrator, personal communication). But Google, like other end-to-end tech platforms, is also a heavy investor in edutech applications promising to use student data as assessment for [marketing personalized] learning (Dijk, Poell, & Waal, 2018; Williamson, 2017). In this whitepaper based on a workshop on equity in technology applications heavily attended by employees of Google, did the authors make a Freudian slip?

We stand at the cusp of widespread adoption of new technologies that have the potential to both radically reduce or exacerbate existing forms of educational inequity...The time is ripe for a coalition that unites research, practice, and design, and that cuts across the public-private divide in the service of a *more equitable future for learning technologies*. (Reich & Ito, 2017, p. 5, emphasis added)

It seems we are collaborating with a monster. Yet as Latour reflects in his essay on Frankenstein and unintended consequences (2012), we are always making monsters – the problems arise when we don’t take care of them. Kuby, Spector, and Thiel (2019) write in the introduction to their book on “Posthuman literacies ” that literacy pedagogies make monsters too. They remind us that while monsters can be disruptive and invasive, they can also be wildly imaginative and full of new possibilities.

5.2.2 Google in elementary literacy education

What are the pedagogical possibilities for collaborative literacy practices with Google technologies? A screen such as a Google Chromebook appears to be a singular device, but as practiced it might do any or all of the following: filter, project, divide, and defend (Kress, 2006). The software at work in and displayed on a screen-based technology is a filter for encoding practice, and the surface of a screen also participates in embodying practices with, around, and against it. There are two streams of inquiry in scholarship that crosscut digital materials with literacy education: concerns regarding the creep(iness) of data surveillance and artificial intelligence into education settings (Williamson, 2017), and questions about how literacies emerge through im/material relations as dynamic, elastic practices (Burnett, Merchant, Pahl, & Rowsell, 2014; Cannon, Potter, & Burn, 2018; Wargo, 2015). Some researchers exploring digital literacies and pedagogies (Hibbert, Ott, & Iannacci, 2016; Lynch, 2017; Nichols & Storniauolo, 2019; Pangrazio, 2016) raise questions about who/what participates in or benefits from these practices. In education systems, however, these cares are often obscured by the push to keep up with the pace of technological revolution. Morris & Stommel (2017) call for educators to tackle the encroach of education technology providers with urgency through critical digital pedagogy. But there is little research on pedagogies, critical or otherwise, for collaborative literacy practices using Google technologies. What literature is available tends to be based in secondary and higher education classrooms and focused on writing and evaluation: measures of student perceptions, writing quality, or writing quantity using Google Docs (see Suwantarathip & Wichadee, 2014; or Brohdal, Hadjerrouit, & Hansen, 2011 for examples).

There is even less research on Google in elementary settings. A search of ERIC, JSTOR, and Proquest Education databases, along with Google Scholar (the irony is not lost on us) turned up 4 studies in elementary schools. Of these, 2 are from the same research group (Zheng et al., 2015; Yim et al., 2014) reporting on a study sponsored by Google to provide Chromebooks to a school district in Colorado. The research evaluated the effects of using Google Docs on improving writing in grade six by studying quantity of writing

and types of feedback generated in the Docs over a year and correlating these results with State end of year writing assessments. Despite the vast amount of data generated, the results did not show a positive relationship between quantity of writing with improvements on the end of year assessment, and the analysis of the feedback data showed it was mainly related to correcting mechanical errors. The authors nevertheless promote the study as promising. A third study shares one of the authors of the first two studies (Krishnan, Cusimoro, Wang, & Yim, 2018), and claims that grade eight students writing collaboratively in google docs produced higher quality essays than students writing independently, but a closer look at the data set reveals practice effects. This study also counted the number of contributions authors made to a shared text using ‘Docuviz,’ a visualization tool for measuring keystrokes in a Google Doc that co-author Wang was involved in developing through studies for Google on user interactions (Wang, Tan, & Lu, 2017). The fourth study (Woodrich & Fan, 2017) compared student perceptions, amount of contribution and quality of collaborative writing of grade 8 students in a school with high numbers of English Language Learners (ELLs). The highest quality writing was produced in the face to face groups, but the ELL students contributed more when they could co-author anonymously. An interesting caveat on participation is included in Wang and colleagues (2017) study aptly titled “Why users don’t want to write together when they are writing together”: quantity and impact do not always go hand in hand when it comes to measuring contribution.

In general, research on literacy education with Google technologies in elementary school has been limited in scope to a focus on writing in Google Docs, on student perceptions, on quantity of contribution, and measures of quality with weak claims. The connection of Google to research in elementary schools on using Google technologies is suspect. No studies have investigated pedagogies for teaching elementary students to work collaboratively in Google Docs, and no studies have considered the Chromebook as a collaborator. We have a choice to make at this point. Literacies make worlds, but we can only bring one into strong focus in this paper. Our data could speak to Google as a colonizer of classroom practice, shipping in guns and horses to excavate and exploit the

data mines. But at this time, we will speak of classroom appropriation, learning how students take the Chromebook and the Doc as participants in making new worlds.

5.3 Methodology

This study is steeped in our experience as researchers and teacher educators in the social practice focus of new literacy studies and pedagogies for multiliteracies (Hibbert, 2017; Hibbert, Ott, & Iannacci, 2016). However, we extend our approach to practice by thinking through some of the complicities and complications of material agency and unpredictability in the literature on posthuman philosophy, complexity theories, and sociomaterial research. Our use of the term ‘practice’ in literacy research signals more than social processes of constructing meaning. Matter is made in practices for meaning making and participates in making meaning (Barad, 2003; 2007).

5.3.1 Posthumanism: more than human, more than material in practice

In literacy research, posthumanist thinking seeks more inclusive understandings of more than human actors in the making of literacies, and a more care-ful attention to the cuts in who/what gets made (Kuby, Spector, & Thiel, 2019). This emerging area of study has roots in new literacy studies, a field that has enlarged its attention to material agencies in making practices, and is now turning its care to how the *immaterial* – the affective, the uncertain, the creative, the energetic, and the memorable, also embody literacy practices (Burnett, Merchant, Pahl, & Rowsell, 2014; Leander & Boldt, 2013).

5.3.2 Complexity theories: uncertainty in practice

Complexity theories draw on examples from diverse disciplinary studies such as biology, mathematics, economics, and networks to model the emergence of phenomena that reproduce yet change in ways which cannot be predicted by their initial state.

Unpredictable stabilities resonate with education researchers interested in the complexity of classroom learning and curriculum design (Davis & Sumara, 2006; Doll, 2008; Osberg & Biesta, 2008). The term emergence here shares an affinity with sociomaterial and

posthuman perspectives on the complicity of practice in making the world – reality is not a static production but a dynamic reiteration, emerging, embodied and materialized through norms and forms (Suchman, 2007). One of the key themes from these studies is the vitality of de-centralized forms of organization. While complexity theories have forged monster tracks through the disruptive ethos of platform tech companies (for an example of the discourse, see C21, 2013), Davis and Sumara (2006) argue that insights from complexity thinking offer educators possibilities for destabilizing many common place ideas about classroom practice, including collaborative learning.

5.3.3 Participants and data sources

Our design decisions stem from video inquiry (Ott, 2020), which composes approaches to narrative inquiry and actor network theory (ANT) into a multimodal and relational methodology for seeing double: social and material as practiced. Narrative inquiry (Clandinin, 2016) and ANT (Latour, 2005) both rely on ethnomethods of field work: observing and talking with participants for an extended period of time. But while narrative research focuses on how human actors put stories into practice, ANT traces the silent agency of other space, time, and material actors (Ott, MacAlpine, & Hibbert, 2018).

Six junior elementary teachers (grades four and five) and assenting students from 2 school districts in Southwestern Ontario, Canada, participated at different points in the 21st century literacies project over a 2-year period. Teachers were given access to an online literacy program in development: Quality Writing in Literacy Learning (QWILL), based on Lois Burdett's work teaching elementary students reader response and writing practices through the plays of Shakespeare (QWILL, 2014). The teachers joined the study because they were interested in the focus on curriculum re-design and in the possibilities of using Shakespeare in their teaching.

The first author (Mary) observed 1 to 3 times per week (generally during 100-minute literacy blocks) for 3 to 6-month periods in each classroom, depending on the interests

and scheduling constraints of the teachers to work new materials into their literacy programs. Fieldnotes and videos were recorded of instances when teachers or students made design decisions with the QWILL materials using technologies and literacy practices that were not in place when Burdett developed her curriculum in the 1990s. Mary engaged in narrative inquiry with the students and teachers by asking questions about what they noticed and why they were making changes to the curriculum materials, often recording these observations and conversations in short video fieldtexts (Ott, 2020). This paper continues the re-visioning work of video inquiry, drawing on texts featuring literacy practices with Google Chromebooks and Docs in two of the classrooms. Using an inquiry guide (Appendix A), we re-viewed video fieldtexts two or more times with the sound off and on to afford close attention to the layering of multimodal actors through unfolding action.

5.3.4 Cases of collaborating with Google

Although all of the teachers in the study used at least one Google technology at one time or another, if only for ‘googling’ information, we focus this paper on two cases where teachers were experimenting with new collaborative practices using Google Docs and Chromebooks. Sites of experimentation, change, or troubleshooting are ideal for observing how practices assemble (Latour, 2005).

Julie heard about the QWILL study from a colleague at another school and shared the idea with the other grade 5 teachers at her school, which is how Ava decided to participate. They teach in a French Immersion school, where French is the language of instruction for most of the day and English is taught as a subject. Both teachers were curious about how a literacy program focused on Shakespeare could extend and enrich their English curriculum making.

Some context on ‘sharing’ the Chromebooks in these two cases of collaboration is needed here. At the time of the study, Julie and Ava’s school shared 3 sets of Chromebooks among 9 junior division classrooms. The school board sells them for \$300 per

Chromebook in sets of 10, and schools must purchase materials through the board unless teachers buy their own supplies. The Ontario Ministry of Education funds technology resources for schools, but these grants do not begin to cover costs for internet access, interactive whiteboards, and computers. Parent councils fundraise at each school to support technology and other initiatives, so there is some local choice but also inequities in how schools get resourced. It was possible at times in Julie and Ava's school to book multiple sets of Chromebooks so that every student had 1 to 1 access. More often, teachers opted to have students share.

A video inquiry must also take care with envisioning findings in research (Ott, 2020). While we followed institutional ethics guidelines for consent to use visual data, in this paper we have decided to story the fieldtexts through vignettes and illustration. Illustration removes the kinds of identifying details that screenshots from videos may entail, and narrative presents movement in and between the actors. For the purposes of tracking teacher and student actors through the vignettes we have opted to use pseudonyms for the teachers and numbers where necessary for the students to indicate turn taking in conversations (S1, S2). Numbering the students in this way also de-centers their individuality somewhat, a purposeful move on our part to notice the configurations of actors in different instances of collaboration.

5.4 Results

By presenting case vignettes as results, we acknowledge that observational research is an apparatus in making discoveries, and Mary appears as the I (eye). The illustration in Figure 4 below is also a result of theorizing the cases visually with an artist collaborator, Jenny Kassen (JKMedia.com). We story the cases featuring new practices with Google Chromebooks and Google Docs in Julie and Ava's classrooms as "making memories" and "making sense," and we invite you to search for three monsters romping through them. These monsters are mostly immaterial, an energy you may feel slipping through the modalities of sight and sound and touch, but they are no less actors. They are the affects and effects of practice, the pushes and pulls of consequence that exceed and escape, yet

also demand attention when they materialize in bodies – human and more than human. These monsters are recognizable by their effects: mayhem, mutation, and magic. Don't let that scare you too much; monsters can be dangerous, and fun. In the spirit of "A Midsummer Night's Dream," let's call the monsters Puck, Bottom, and the Fairies.

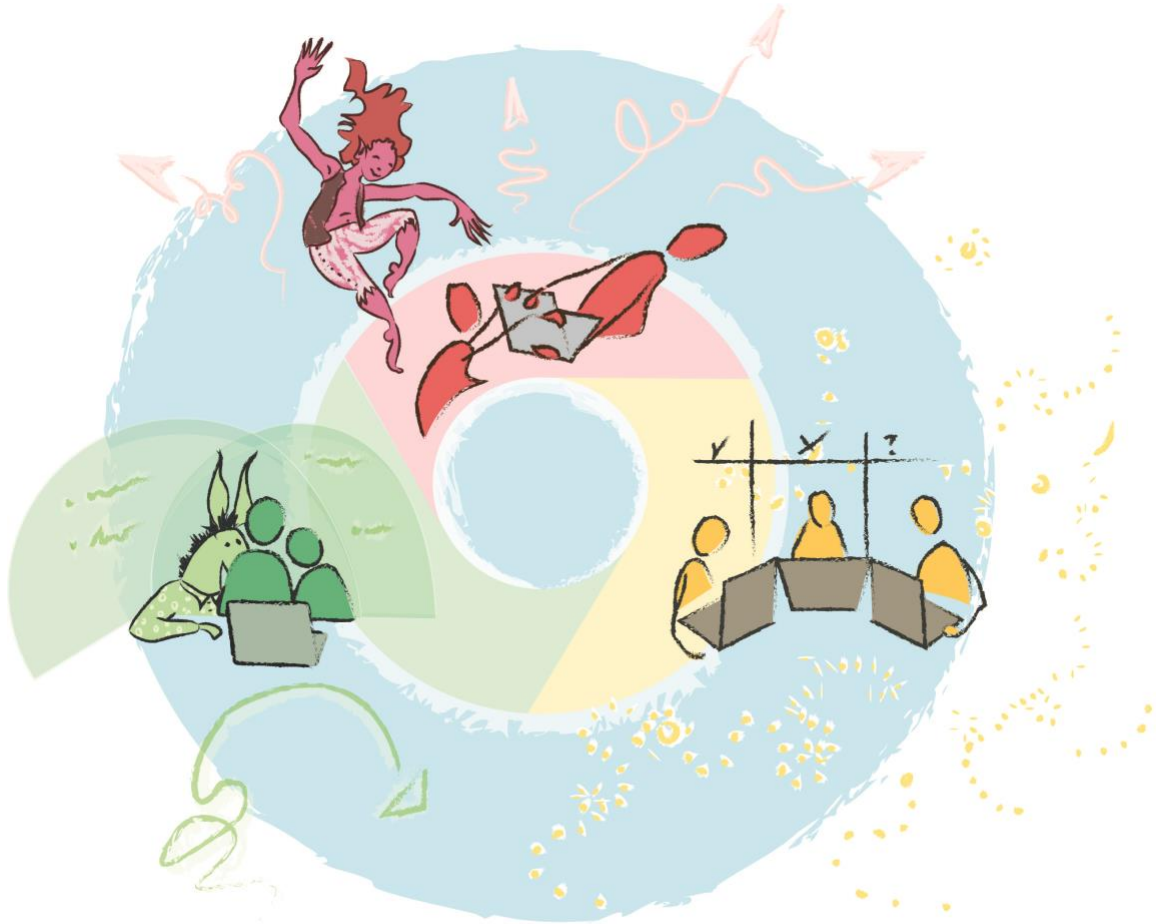


Figure 4: Monsters in Collaborative Practices

We use the vignettes and illustration to play with Puck, Bottom, and Fairy magic, evoking moments that resonate with literature on im/materiality and complexity. As the illustration shows, these monsters are made in and through collaborations with Google Docs and Chromebooks. In the discussion we turn to implications: How might teachers

care for the magic of monsters exceeding and escaping our grasp of collaborative learning with Google?

5.4.1 Making memories: May Day planning with Chromebooks and a Google Doc

One of the first lessons in the QWILL program for *A midsummer night's dream* is about holidays. Because students won't be in school for the summer solstice, the lesson design in QWILL makes a connection to traditions for celebrating the end of winter on May Day. Ava has decided her class will research these traditions to plan their own celebration. The students are already in pairs at their assigned desk groupings, which Ava changes each month. She tells the class they have 15 minutes to research ways to celebrate May Day with their partners using shared Chromebooks. Ava opens up a Google Doc to display on the class interactive white board (IWB) and says: "We're all going to be on the same page, we're all going to work together, because you've got to learn how to work together as a team. I'm making bullet points, just add bullet points as you see fit."

As Ava speaks, my video camera pans around the room. One student has run a Google search for "May Day" already, another opens Ava's Google Classroom and clicks on the link for the Doc. In another pairing, a Chromebook sits partway between the desks of the students, but it's an 80/20 split. The student with the larger share points to a bullet point to draw his partner's attention, who has not been looking at the screen. On screen, I see someone else is deleting this point as he groans, "What's happening? Who deleted this? Someone deleted ours!" I hear laughter and my camera pans to the pairing at the desks facing him. A girl hoots, "Someone took our point, so we erased it!" The frustrated boy replies angrily "You took and deleted ours!" Then he turns to Ava, who has been walking nearby and complains, "Someone deleted ours!" Ava responds breezily, "Click undo!" and moves on. I circle around to the laughing pair and ask, "How are you deciding who does what, are you taking turns?" The girl who deleted the bullet point says "pretty much" as her partner pulls the Chromebook slightly towards himself and begins

searching for a different May Day link. She points to where she wants to go next: “May Day Food!” and takes control of the keyboard again.

I move to a new pairing. They are looking at an image of a girl in a white dress at a May Day celebration. The partner with the Chromebook reads aloud, “white dress,” and clicks back into the Doc looking for a place in the growing list to add this information about what to wear. Her partner wants her to paste in the link to the image. He keeps repeating in louder tones, “Images, images, go to images!” As frustration grows, he leans further and further into the screen that is firmly on her side of the desk until he takes over the keyboard.

Another pair of students each have a Chromebook, working so closely their screens are touching. Ava notices and tells them they are supposed to be sharing and should put one of the Chromebooks back in the charge cart, then walks away. The pair has a short, heated discussion about who will be the one to give in, then one partner gets up in a huff.

Meanwhile, Ava keeps one eye on the students as she circles around the room, and one eye on monitoring the information on the IWB:

Good, looks like this is coming together really quickly... Twelve more minutes!
...Can someone find a video of people dancing around a May Pole? Good! What
other videos can you find about activities on May Day? ... Someone found
information about arts and crafts – what kind of arts and crafts?

Another pair of students have a discussion about changing the shape of the bullet points and this information begins to circulate through the room: “Wait, we can put darts?” “Someone changed it to numbers!” The pair across from them is looking up recipes for May Day. One asks the other, “what should we choose?” and their partner points to a link, “Celtic recipes for a May Day feast,” saying, “That looks good – how do you get your cursor so big?” Around the room, students are watching videos of people dancing with ribbons around a Maypole, adding links to recipes, and looking up other May Day activities. I ask another pairing of two girls what they’ve been working on, and the one with the Chromebook replies they have found suggestions like “writing poems, telling

stories, making May baskets – [her partner, who has been watching the screen with her head on her desk, rises up in excitement: “Ooh, we could make May Day baskets!”] As she adds ‘poems’ to the list, her partner keeps insisting she doesn’t forget to add the idea about the flower baskets.

I continue circling around the room, recording short videos of different pairings but keeping my focus nomadic so I can study the group process as a whole. When I pay close attention with the sound off to re-view these videos, however, I see that I have unwittingly documented an ongoing struggle between one pairing in three recordings. In the first clip, I notice that a boy thumps his hand down on his desk in a frustrated gesture, taps impatiently three times, then reaches and pulls the Chromebook his partner is working on towards him. Almost immediately she grabs it back. In the next clip, the class is focussed on the IWB while Ava is pointing out the different points in the Doc. The boy stretches his arms up and out as if yawning, then slides his arm along the desks toward the Chromebook on his partner’s side, eases it toward his desk, turns toward it and quickly starts tapping on the keyboard. Just then she turns, catches him in the act, and slides it forcefully back over to her side. My gaze shifts to Ava, who continues the shared editing of the Doc, reading and scrolling through the two pages of bullet points on the IWB, pointing at things, pondering, turning to talk to the class:

Yes, yes, yes, sparklers? We’ll have to ask the principal about that – ribbons – can someone move that point next to the one about the May Pole? Nettle cakes with sweet herb sauce – that sounds exciting, did someone link a recipe for that? People wear white clothes – delete that, we already have a comprehensive point about that – flower garlands, cut and paste that up with the baskets, dancing, we’ve got that... write poems – ooh I like that! Except someone just deleted it. Control undo! Archery competition – that could be hard... oh, darts and balloons, that sounds like fun! Super - this sounds like it’s going to be a great day!

Ava ends the period by announcing that another May Day tradition is to choose a Queen and a Lord of Misrule. The students must prepare a short speech to persuade the class why they should be chosen, and yes (in response to a question), girls can choose to be the Lord of Misrule and boys can be the Queen. As Ava turns her back to the class to add

these final details to the Doc, the boy sees his window of opportunity open one last time. He leans across his desk into his partner's space, tapping frantically on the keyboard. She turns, gasps "Stop it!" and snatches the Chromebook away yet again, but the deed is done. As Ava readies her hand to type, she notices a coloured icon blinking across her desktop screen as these words appear: "A nerd war?! – I'm just going to delete that, so I've got room." But the students nearest to her pick up on this, and news travels quickly:

Nerd war, ha ha!

Nerd –

Nerf war! We should have a nerf war!!

That sounds like fun! But I don't think we'll get to do that...

When May Day arrives, I come to document the celebrations. They spend the morning making brownies and fruit trays and flower garlands with the help of parent volunteers, then head out to the school yard for a picnic. It's a beautiful day. The class looks beautiful too, glowing faces and bodies dressed in white, festooned with garlands and floral head-dresses – and sporting nerf guns. Ava had plans to teach a complicated dance weaving ribbons around the basketball pole, but she is exhausted. May Day ends with a glorious, unstructured nerf battle. One of the parents comments on the fun, "I had to study Shakespeare when I was in grade 7, and it was so boring, I don't remember any of it!" Still, Ava is a bit disappointed that she didn't get to the dancing. I say the students probably had an experience today they will never forget. Ava agrees that an important part of curriculum making for her is making memories.

5.4.1.1 Puck

Here is a possible headline for the May Day story: "Mayhem Ensues as Students Fight for their Right to Party." Mayhem has a legal definition: causing maim; and a common definition as a noun indicating a chaotic, lawless, violent situation (Merriam-Webster, n.d.). In this vignette of class collaboration with, around, and against Google Chromebooks and Docs, the aggressions of students jockeying for control of meaning-

making in this way might be read in this way. Fingers and feelings were pushed, pulled, and poked.

But mayhem can also express the more playful connotation of a scenario veering between injury and Puckish, rollicking fun, as in this usage: “With 20 kids running around and only two adults to supervise, it was complete mayhem” (Cambridge Dictionary, n.d.). As the students in Ava’s class discovered, May Day has a tradition of celebrating this kind of mayhem through the crowning of the Lord of Misrule. In many ways the line between order and disorder characterizing Puck’s role in Shakespeare’s play is also the life force of Ava’s pedagogy. For example, she set some boundaries on the party planning but let the nerf war happen, because her goal was to work as a class to plan a memorable celebration. She also affords some push and pull in how students work out their problems of access: “Click undo!” and “one of you has to put the Chromebook away.” Of course, the access this gives to some bodies can lead to disadvantage for others. The question remains how to care for the monster of mayhem so that it keeps its playful, Puckish quality.

To answer this question, we disrupt some commonplace notions about classroom collaboration through this story. First, although we use gendered pronouns for the students in the vignettes, we do it strategically to highlight that control of access does not fall neatly into male/female categories. Next, we also displace the commonplace of agencies for collaboration between the actors in the story with the use of the word bodies. The body of the Chromebook pushes student pairings into a cascade of decisions about configuring their bodies to make meaning with and through it (Davidsen & Christiansen, 2014). Burnett (2014) speaks of the audiencing relation that a laptop screen can position students into. This relation is practiced through the material resources in the screen for display, and immaterially by the students’ past experiences of watching movies and tv. Different kinds of relations are possible with horizontally placed touchscreens (Higgins, Mercier, Burd, & Hatch, 2011).

Suchman (2007) describes the interface of digital screen and user, “not as an a priori or self-evident boundary between bodies and machines but as a relation enacted in particular settings” (p. 263). These relations are ‘configurations’ which actively and continuously reconfigure, or embody, sites of ‘human’ and ‘machine’ and ‘interface’ through the reiteration of norms and forms (Suchman, 2007, p. 272, expanding on Butler’s ‘Bodies that Matter,’ 1993). Norms and forms are themselves embedded in vast sociotechnical webs of labour that are blackboxed at the interface. The software design of the Google Doc is also an interface, a human-machine reconfiguration with features such as ‘undo’ and ‘suggested edit’ iterative responses to user demands for protecting intellectual property in co-authored text (Wang, Tan, & Lu, 2017). According to Suchman, “our task as analysts is to then expand the frame, to metaphorically zoom out to a wider view that at once acknowledges the magic of the effects created while explicating the hidden labors and unruly contingencies which exceed its bounds” (2007, p. 284). Looking at the ‘Making Memories’ story from the wider angle of the May Day party, the characters are mutually constitutive, they embody the party. We can’t re-member this May Day without the bodies of the Chromebook and the class Doc.

However, because human bodies are complex, unruly, contingent phenomena in their own right, the same forms of collaboration with Google on another day will result in a different party. This is the third observation we want to make about collaboration. A creative collaboration is a complex emergence. Complexity requires noise, exchange of matter and energy, some friction. A complex system has vibrancy; a completely stable and predictable system lacks life (Davis & Sumara, 2006). So, unpredictability is also essential. Plan a party with others again, and there will be different tipping points. In this May Day iteration, the student with the seemingly least amount of agency struggled the hardest and longest to make a point. “Nerd war” seemed to be the smallest point, almost overlooked and vetoed. But it came at the right time to be the sticking point. The “vital simultaneity” (Davis & Sumara, 2006) of controlled chaos is essential to the conditions for complex forms of collaboration.

In other words, we need some Puckish mayhem in classrooms. But the boy who wanted a nerf war has a learning disability. It is common pedagogical practice to pair students who struggle with reading and writing with those who are ‘stronger.’ Watching this student struggle for access to a literacy practice, it is tempting to steal this struggle (Fox, 2001). Perhaps he should have had access to his own Chromebook. Perhaps Ava might have afforded more choice in who to collaborate with. The next vignette picks up where this problem leaves off.

5.4.2 Making sense: Character maps with Chromebooks and Google Docs

Julie sits the class on the floor in front of the interactive whiteboard (IWB) to begin a lesson from QWILL. They have just finished a shared reading from Burdett’s (1997) adaptation of “A Midsummer Night’s Dream,” where a twist in the plot introduces the characters of the mechanicals and the fairies. The lesson in QWILL has the students work together to draw character maps. Julie opens a Google Doc on the IWB and shows how to find drawing tools in the menu. She demonstrates adding shapes such as boxes and circles, and as she does this, she says:

We’ve used Google Docs, we’ve used Google Slides together, but we’ve never used google drawings [S1: this is going to be *awesome*] because I want you to, there’s many characters we’ve met so far – how many groups of characters have we met? [Students list the mechanicals, the fairies, and the Athenians]. I wonder if your chart will have 3 different parts? [Julie enlarges a circle as she speaks and draws three lines inside to divide it into thirds]. But there’s different ways of doing a flow chart ... What I would like to see is your understanding of the different characters and how they are connected.

Now Julie sends the students to pair off and get the set of Chromebooks from the charging cart. Some students choose to take individual Chromebooks but work together in a shared Doc, some share one Chromebook between them, and one pairing uses the teacher’s desktop computer, which is positioned so their backs are to the rest of the class. The students had choice in who to work with and where, so there are friendship groupings of girls with girls and boys with boys, leaning close together or spaced further

apart depending on desk/chair/laptop/human configurations. As they settle into the task, I ask Julie about her purpose in using the drawing tools in Google Docs for the character mapping and what she is noticing.

Julie: So my goal is two things – to understand where they’re at in terms of understanding the relationships between the characters, so it’s a bit of a diagnostic, and also to give that element of technology and inquiry, where I want students to show how they use technology to create a drawing that shows the connections between the characters... Usually I talk about perseverance in technology – “when I learn something new, how am I going to physically be?” But I didn’t do that this time – now that I’m talking to you, you know what I might do? I might stop the class and say, “ok, we’re learning a new program, how are we feeling and how are we working through it?” Because technology has some frustrating parts to it, so just bringing that to the surface and acknowledging it.

Julie and I go off in different directions, she to answer questions and observe the students and I to record different groupings. In the first pairing I come to, one partner has the Chromebook on his desk but has angled it so his partner can see it. He is typing in character names and pauses to ask, “what’s her name?” His partner must know what he is referring to and answers, “Helena.” Just then Julie, from another corner of the room, addresses the class: “Don’t forget we have a list of the character names in your duotangs – if you don’t know how to spell ‘Egeus’ you can look it up – and don’t forget you’re on the internet as well.” The boy typing thinks about what he might search for: “What’s the play called again?” His partner jokes, “A midsummer nightmare!”

I scan my video camera around the room again. Two girls are working so closely together that one leans on the other’s shoulder while her friend adds something to their drawing. Then she slides the Chromebook over to her side of the desk while her partner exchanges a smile. As I turn away, I notice a pair of boys also leaning towards their shared Chromebook but locked in a struggle. The boy with his hands on the keyboard leans his elbow into his partner’s space, effectively boxing out his access. He is trying to move a

line in their map with no success, grunting aloud in anger: “URRHHG! I hate this! Dumb thing!!” His partner reaches a hand in to try to help, but he shoves it away.

Julie has been circling about the room opposite from me and her focus has been on how the students are problem solving how to find and spell the character names. She decides to check in with the class now:

I have two questions for you. First, how are you remembering the character names and how to spell them? [a student volunteers: the chart in our duotangs] Is there another way that you can find out? [Another student: you can search it up] Yes, you can search it up in Google. Second question, how are you making out with the new system that we’re using, the Google drawings? ... And are you looking for input from your partner as well, or are you doing all of the work? That’s a question I’d like you to reflect on when you’re doing your collaborating. Are you looking for the other person’s voice?

While most pairings are sharing a Chromebook, a few each have one but are working together. Three girls are clustered at a round table so they can work side by side yet virtually. They can’t see, or don’t try to see, what the others are doing unless it is in the Doc. One of them says to Mary: “I didn’t know how to spell the names of the mechanical characters, so I went on Google and searched up ‘midsummer night’s dream’ and ‘mechanicals’ and I clicked on the first site and I got all of the names.” Meanwhile, her partner looks at a different site also featuring the characters from the play that has cartoon drawings with their names above.

Julie and I continue to observe and record around the groups, sometimes crossing paths. My next video recording picks up the following conversations:

Student 1 to Julie: I found a site that has all of the character names.

Julie: that’s good, can you tell Student 2? Because he was looking for that information.

Julie to Mary: I try not to answer the questions, if I can – I try to let them talk to each other, professionally - so that they learn collaboration talk.

Student 2 makes an exaggerated monster face and growling voice as he jokes to his partner: Watch my face when I say Egeus!

The last pair I record are also working on a shared screen, but this is a computer desktop positioned against a wall. This means this pair has their backs to the rest of the class, working in their own bubble. They started with the teacher's example of a pie chart in thirds but are working in one third. The student with the keyboard adds ovals and colours to encircle different characters in what looks like a complicated love knot.

Mary: There's a web of things going on here. I'm curious how you decided to use those colours and patterns?

S19: We made it up as we go [S20: yeah] but we think that red symbolizes hatred...but we don't know –[looks at S20] who should we put Duke Theseus with?

S20: With Egeus because they're friends so it's green.

S19: Ok, and green symbolizes [S19 and S20 finish thought together] friendship!

5.4.2.1 Bottom

Nick Bottom is a shape shifter. He spends part of his time behaving like an ass in “A Midsummer Night's Dream,” and the other part magically mutated into a monstrous version of one, half man, half donkey. He stumbles into the play, and bumbles through and out of it, a random actor picked up by Puckish luck and used to affect relations between the other characters. Through no will of his own, his effect swirls through the world of the play, playing a role in resolving conflict into harmony. Where can we find the shape shifter, the happenstance, the monster of random variation effecting the story of “Making sense?”

Julie's and the students' purposes in illustrating the relationships between the characters shape shifts as they collaborate differently together. One group asks about finding spelling for the character names, and Julie and other nearby groupings get swept up in it. I ask Julie what she is noticing about the different kinds of collaboration, and a momentary eddy from the stream of making sense of character relations swirls off, as Julie tries to surface how the students are relating to Google and to each other: “technology has some frustrating aspects...how are you including your partner's voice?”

Although the students chose who and what to work with, some configurations were combative, others harmonious. Perhaps the uncertainty of who to partner with and how to proceed fed desires for certainty and control in some groupings. Working on different laptops on a shared Doc didn't necessarily promote collaboration. The inclusion of voice was sometimes a group process of attunement to other voices, randomly selected through proximity and shifted to other locations. At other times, it was an affective choice, as students desired to control or share meaning making. In the pairing with the most divergent and complex form of mapping character relations, surely the happenstance that they were working in a unique material configuration (desktop computer, backs to the class) participated in this making.

In their critique of what is assumed about designs for meaning embedded in the pedagogy of multiliteracies, Leander and Boldt (2013) point to that which is not designed – the role of chance, of whim, of desire in literacy practices. They find Deleuze and Guattari's notion of affective emergence helpful to include in a pedagogy for literacies:

What emerges that was not premeditated? ... the emergent unfolding of experience, moving not linearly or rationally, but through the production of affect and effect...The issue is not only what resources are in use in classrooms. Rather, to be within the pedagogical moment in that classroom, a teacher would need to consider whether he or she and the children are able to bring the materials into a "composition of desire" (Deleuze & Guattari, 1987, p. 399, cited in Leander & Boldt, 2003, p. 39).

In this story of making sense, we see how collaborative work can emerge through compositions of desire. Although Julie gave her students some materials, an endgame, and a starting point, there was room for fluidity, chance, and whim. We also see how difficult it is for teachers to create the conditions for complex emergence without falling into passive attunement to the nearest presences, how both the material and immaterial can remain out of sight but at work, and the physical and emotional configurations it takes to include the other's voice.

5.4.2.2 Fairy Magic

Ephemeral and atmospheric, most of the fairies in a *Midsummer Night's Dream* appear as extras. They are part of the world of the play, but we do not follow their stories. They are mostly just out of reach, exceeding understanding. In the current shift to understanding literacies as emergent practices, authors search for metaphors like energy (Tanner, Leander, & Carter-Stone, 2020), spirit (Perry, 2020), and muchness (Thiel, 2019) to describe that which is more than the sum of its parts in practice. From mathematical modeling of emergence, we also have this understanding of the more:

The single actualised version—the 'solution' that is 'chosen' by the system—is always one among a number of plausible alternatives that happened not to occur. This means that the 'solution' a system will finally 'settle on' is not a foregone conclusion, but always a matter of chance. To put this another way, the pattern (or organisation) that emerges at the higher level is not only a product of the system's relational past but also of 'something' that is not present in the system at all. (Osberg, Biesta, & Cillier, 2008, p. 224)

What was *absent-present* or *more than* in the collaborative makings in Julie and Ava's classrooms? There were slippages in what counts as literacy. Does it make sense to speak of 21st century collaborative practices, when literacies are always collaborative practices effecting im/material actors? There were complex intra-actions, bodies of students, Chromebooks, and Docs emerging through practice that the teachers could not possibly take in all at once. They made some intentional cuts about what to work with, but there were also the absent-present, magical monsters – affects that seemingly had nothing to do with collaboration: “watch my face while I say Egeus!” but everything to do with effecting collaborative actors.

5.5 Discussion: Caring for monsters

Faced with complexity and indeterminacy in collaborative practices, what can we offer as pedagogical moves for teachers? Most authors describing emergent pedagogy suggest a stance that recognizes that the monster effects and affects of chance and desire can't be designed *to*, but can be designed *for*. They can be *invited*: “Can the teacher make space

for fluidity and indeterminacy as the nature of things?” (Leander & Boldt, 2013, p. 34); *noticed*: “Can he or she recognize difference, surprise, and unfolding?” (Leander & Boldt, 2013, p. 34); “such processes are activated through desires and currents of energy, shimmering with atmospheric and bodily intensities and saturated with emotion” (Tanner, Leander, & Carter-Stone, 2020, p. 15). And they can be *played with*: “play as a way to see and act with potential in situations, self, and other(s)... embracing the temporal/spatial negotiation of risks and opportunities afforded, interdependent with imagination” (Macintyre Latta, 2012, p. 6).

Inviting, noticing, and playing: these are ways to care “response-ably” (Thiel & Kuby, 2019) for monsters emerging in collaborative literacy practices. But of these, we think that noticing (Rosaen et al., 2008) might be the hardest to practice.

5.5.1 Noticing care-fully

In these cases, Julie and Ava were making space for fluidity. They each had an end-game in mind for collaborative making with Google technologies that made room for the noise of variation, interaction, and indeterminacy that is necessary for creation – in Deleuze and Guattari’s expression of the idea (1987), for making lines of flight rather than tracings. Difference is essential to the space of emergence, as Osberg, Biesta, and Cillier suggest:

The first thing to notice about the curriculum as a 'space of emergence' is that it is not a space of common ground. Because human subjectivity emerges only when one acts with others who are different... this means education only takes place where 'otherness'—being with others who are different from us—creates such a space. (2008, p. 324)

We are not suggesting that difference always emerges through conflict or advocating that aggressive behaviour should be encouraged as a way of tilling common ground for new growth. But at the same time, the conflict over access to the Chromebook that went unnoticed by Ava became a fertile space for the May Day nerf war.

5.5.2 Noticing diffraction

What we are trying to say is, *not-noticing* is not necessarily a dangerous monster. It is an absent-presence that can have both positive and negative effects. But not-noticing can take the form of passive attunement to the nearest available energy source, and become care-less. Did Julie's invitation to play with different ways of mapping the character relations in *A Midsummer Night's Dream* get somewhat squashed by her attunement to how students were figuring out the character's names? We are advocating for active attunement, or care-switching. In their review of research on collaborative pedagogies, van Leeuwen and Janssen (2019) describe a process of "mirroring," (p. 79), whereby when teachers focus their attention on the content of the task, students discuss the requirements of the task in their groups; and when teachers provide feedback on the collaborative behaviours they notice, students likewise focus on how they are working together. Rather than mirroring in the sense of reflection, we see this finding as evidence of diffraction. A diffraction pattern is like a mirror forward, showing the effects of action – marks on a screen, marks on bodies, which emerge from an apparatus of discovery (Barad, 2007). Teacher noticing is not the only source of affect in a classroom, but it is an immateriality that matters. Teachers can practice different ways of noticing. What might have happened, for example, if Julie had spent more time surfacing the trouble of collaborating with her students?

5.5.3 Noticing bodies

Teaching for emergent practice is difficult. Tanner, Leander, and Carter-Stone (2020) describe the expertise involved as a pedagogy of improvisation that notices and plays with affect:

The teacher adopting an improvisational approach feels forward and back along the lines of intensity: Where is this moving? Where could it go? What could provoke movement? What attunements are being made? How can differences be provoked, along the lines that we are collectively exploring, to break repetitions?"... The improvisational teacher might pay attention to bodies, not in the sense of scripted, classroom drama but in the ways that the teacher notices, animates, and interprets the energies being exchanged. (p. 15)

We suggest that the strongest pedagogical move teachers can make to leverage both the material and immaterial - the resources, happenstance, and desire composing collaborative practices with Google technologies, is to care-fully notice the bodies. Looking at the illustration of the cases in this study from the widest possible angle, we see diffraction patterns showing up as bodies: screens, students, shared literacy practices becoming together. Teachers can enact care for collaborative, emergent literacy practices by actively attending to bodies in relation.

5.6 Conclusion: Monsters and Magic

We have added complication to the notion of collaboration in 21st century literacy practices by noticing the complexities of collaboration with Google Chromebooks and Docs in elementary classrooms. Mayhem, mutation, and magic are effects and affects that ensue, embody, and escape from curriculum making. There are playful and careful ways teachers can work with such monsters in pedagogies responsive to emergence. And we must be responsive to emergence, because literacies make worlds. There are many other ways to make sense and make memories that are not high tech. But other studies of Google in classrooms reveal how students love to work with Google technologies, and we have to agree. Comments such as “this is going to be awesome!” are not uncommon when teachers point students to the Chromebook charge cart. Eyes light up, energy sparks. Students love the ease of making with Google. Easy and powerful tools seem almost magical, because the labour invested in making them easy and powerful remains hidden (Suchman, 2007). We showed how classroom literacy practices are complicit in making the 21st century and tended to the monsters of unintended consequences – magical and dangerous, that we participate in making too.

5.7 Epilogue: Love in the 21st Century

An Apple laptop, a Microsoft Office connection to work, and access to literature through Google’s search engine also collaborated in the making of this paper. In his essay titled “A more lovingly made world,” Wark (2013) reflects on the fun his children had at a

digital maker fair and who else paid the price in materials and labour. As we conclude, we are cut off from much of the touchable world during the Covid-19 pandemic. In this time the essential hidden collaborators making the magic of digital practices are revealed: the hydroelectric workers, the miners, the food producers, the transit workers, and the care-providers, among others. Surely this is a time to consider how worlds can be made in loving ways.

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Chapter 6

6 Formative Space: Literacy Practices in 21st Century Curriculum Making

The call is out for the development of global citizens with global competencies – people who can work creatively, critically, and collaboratively across cultures and disciplines to solve complex problems (Schleicher, n.d.). Educational agendas for 21st century learning call for curricular and assessment reforms to better inform how we participate in life today (Burns, 2017; Fullan & Langworthy, 2013; Griffin, McGaw & Care, 2012).

Of course, it is essential to explore who makes these calls and who benefits. Disciplines form subjects (Foucault, 1975). It matters *who* is exercising an agenda. Posthuman and sociomaterial orientations also question reforms. But the ontological problems they raise are, *what* is being materialized, and what is participating in this work? Disciplined practices of observation form objects (Barad, 2003; Mol, 2002). Is cross-disciplinarity possible? If so, it must be performed.

6.1 Re-membering the study

“Formative Space: Literacy Practices in 21st Century Curriculum Making” engages with questions of formation in the practice of education by exploring some more than human participants. How do material and immaterial actors participate in literacy practices in the 21st century? How do forms of curriculum making and assessment participate in making actors? What space for learning is made through different forms of inquiry? Central to this work is the idea that assessment is inquiry, a disciplined practice of attention. My realization from studying enactments of a literacy curriculum, is that literacies are also inquiry practices.

My doctoral study is part of a SSHRC Partnership Development Project with QWILL Media and Education, Inc. QWILL was developing a digitally presented literacy

program based on Lois Burdett's (1997) adaptation for children of Shakespeare's play, "A Midsummer Night's Dream." The goal of the QWILL program is to afford a rich, "thinking" curriculum to elementary students through immersion in the thematic world of the play and in-depth exploration of the writer's craft (QWILL, 2014). In this project, we set out to study the ways curricular resources are redesigned by teachers and students through 21st century technologies and practices. The purpose of the SSHRC study is to investigate how multiliteracies practices that leverage the participatory culture afforded by 21st century technologies might be documented to represent authentic assessment of multimodal literacies for educators, students and their parents.

Teachers are researchers of students when they observe, document, and evaluate learning (Delandshere, 2002), and students are researchers when they reflect on their own and others' learning (Hargreaves, 2013). Hargreaves, Earl and Schmidt (2002) remind us that classroom-based assessment is no more naturally authentic or ethical than any other kind of research. Assessment narratives become lived experience (Ott, 2016).

This study aimed to redesign assessment in the QWILL curriculum through collaborative forms of inquiry with teachers and students (Ott, 2020). In so doing, I intended to respond to Sørensen's (2009) work on the materiality of learning, which introduced me to the concept of topology; how different spacetime matter assemblages make different relational spaces for learning. Fenwick and Edwards (2013) raised, to my mind, the question of most urgency for studying the sociomateriality of learning: What pedagogical assemblages are most responsible to students?

Guided by my master's study of assessment narratives (Ott, 2016), Delandshere's (2002) concept of assessment as inquiry, and Fenwick and Edward's (2013) discussion of pedagogy as assemblage, the research questions I set out to study were:

- 1) How might students and teachers redesign assessment in participatory ways in the QWILL curriculum?
- 2) What assessment narratives are composed when teachers, students, and activities are assembled?

For the purposes of my study, I use the words ‘collaborative’ and ‘participatory’ interchangeably to describe an approach to inquiry which is responsive to the interests and needs of different participants, and which questions the material and discursive boundaries between that which researches and that which participates. In order to stay open to the teachers’ interests, as well as my own, I chose an integrated thesis format.

These questions about participatory design and assemblages of curriculum making framed a broad but integrated site of inquiry to work collaboratively with teachers and students on assessment puzzles in the QWILL curriculum. My goal was to invite more influence and more insight into assessment which can support literacy practices in the 21st century. In particular, I was taken with Latour’s analysis of participation and what it might mean for assessment:

You watch a painting; a friend of yours points out a feature you had not noticed; you are thus made to see something. Who is seeing it? You, of course. And yet, wouldn’t you freely acknowledge that you would have not seen it without your friend. So who has seen the delicate feature? Is it you or your friend? The question is absurd...The more influence, the better. (2005, p. 237)

6.2 Re-visiting the results

In Chapter 2, I described why I wanted to expand my disciplined practices of knowing by combining approaches to narrative inquiry and actor network theory through video inquiry. I detailed the affordances for seeing with and through different modalities, the complexities of attending to human and more than human participants, and how my way of objectifying literacy was re-vised by observing with others. In this case, the more influence, the better.

But is more influence always better? In Chapter 3, I described what happens when we don’t see, when routines, schedules, forms, and expectations discipline practices of observation out of sight. Despite our best intentions, silent actors can still direct our attention in ways that lead to unintended consequences. Now, I understand better what

Latour meant about the value of recognizing influence – knowing how to tend to what participates in forming us.

6.2.1 Pedagogical narratives and monsters

Something unlooked for but serendipitous happened in the making of Chapter 4. The teacher participants were invited to throw out the rubrics and redesign the literacy and assessment practices in the QWILL curriculum, but they were French Immersion teachers. This gave them even more freedom to play and less pressure to evaluate, because they felt more accountable for literacy achievement in French. In these cases, I asked the teachers to be explicit about how they were engaging formatively: What they were noticing, what they would do next. Because most of this noticing occurred while the learning was in process, this drew my attention to the ways that long before teachers practice feedback *on* learning or tell assessment narratives *about* students, assessment is *in* curriculum making. Assessment is in the teachers' "pedagogical narratives" for teaching literacies in the 21st century: what they desire, expect, look for, and inquire about. Although I didn't name it as such because I was coming from the discipline of narrative inquiry, I see now that the turn to affect and other immaterialities in literacy studies (Burnett et al., 2014; Leander & Boldt, 2013) is also a fruitful way to talk about how stories are actors (Frank, 2010) in embodying experience. Pedagogical narratives animate curriculum making.

In Chapter 4, my attention to different enactments of the same lessons in the curriculum showed how spacetime-matter for learning is improvised by the repertoire of inquiry practices in classrooms. This is a contribution to an understanding of the enactment (Mol, 2002) or performance of objects (Barad, 2003), which connects with notions of professional expertise (Sawyer, 2011). Extending Pryor and Crossouard's (2010) discussion of relational space for disciplinary learning, Chapter 4 is also a contribution to more complex understandings of literacies as inquiry and assessment as pedagogy by describing how literacy practices make inferential, iterative, resonant, and fluid spaces for disciplinary learning.

Chapters 3 and 4 are studies of human teachers and more than human space, time, and matter actors in curriculum making. Chapter 3 also looked at unintended consequences teachers might plan to avoid. I was thinking then about the epistemologies of assessment and curriculum materials; their effects in how we come to know. Chapter 5 is a closer look ontologically at the students, teachers, and technologies effected through curriculum making, and the immaterial affects which play a role. Pedagogical monsters (Kuby, Spector, & Thiel, 2019) are affects and effects which can't be avoided; but must be tended to. A study in tipping points and ripple effects, Chapter 5 explores the problem of what emerges from inattention through the lenses of complexity thinking (Davis & Sumara, 2006) and diffraction (Barad, 2007).

6.3 Envisioning implications

My study has made contributions to qualitative research through my approach to video inquiry, which will be of interest to researchers of multimodality, those engaging in narrative inquiries, or those studying sociomateriality (Ott, 2020). It has also contributed to scholarship on formative assessment and literacy practices in elementary education (Ott & Hibbert, 2020). More importantly to me, my doctoral work has given me tools to conceptualize practice and inquiry to continue working with. Understanding that knowing is inseparable from ensembles for making known is what Land, Myer, and Smith (2008) call a *threshold concept*. Once you walk through that door, it changes what you know and how you act. As an educator, you realize you are complicit in making worlds. You also realize learning is a complex, contingent phenomena.

As Dewey put it, “The problem of an education based on experience is to select the kinds of present experiences that live fruitfully and creatively in subsequent experiences” (1933, pp 27-28). This is a problem we must engage with if we value creative, critical, cross-disciplinary learning in the 21st century. Dewey goes on to define the makings of educative experience through interaction and continuity. Ecological interaction is central to Dewey’s conception of agency, and Dewey’s work has been foundational to notions of

teacher agency in curriculum making (Clandinin & Connelly, 1992; Priestley, Biesta, & Robinson, 2013). I engaged with these ideas of curriculum making in chapters 3 and 4, adding a contribution to Priestley and colleagues (2012) notion of agency as “space for manouever” by considering how assessment practices make space for learning. However, I have learned to also consider the complex effects of contingency and intra-action in educative experience. What disassembles practice? What bodies are formed by interest and inquiry? These ideas to think with allow me to also contribute to medical education (Ott et al., 2020) and teacher education (Ott & Hibbert, in review).

The following ideas from this study are principles which I continue to work with in my teaching and research:

6.3.1 Formative pedagogies

“Assessment measures perform a failing system, if the measures fail to ask the right questions about performance” (Ott & Hibbert, 2020). Assessment plays a performative role in embodying students, teachers, and materials. When we think about formative assessment as disciplined pedagogies of paying attention, it opens our eyes to valuation. If we value creativity and variability, for example, we have to be asking open questions about possibility. If we understand that collaborative learning is emergent, differential space for emergence is necessary. These practices require an approach to “formative assessment of the unexpected.” On the other hand, when we need argumentation and diagnostics and logical problem solving, we need standards to enact the relational spaces in which evidence and logic can function.

6.3.2 Not everything we value should be evaluated

This pedagogical principle is vital if we value risk-taking (Ott, MacAlpine, & Hibbert, 2018). In the example of learning to consider other perspectives, it was tempting to tell safe stories, or, “the story of how I wanted it.” It is also vital to keep teachers open to learning: “He’s a student with D’s in reading, but what else do I know about him as a learner?” (teacher participant, Ott & Hibbert, 2020). Here, we should take note of the

ripple effects: what is embodied, but also what escapes and exceeds our attention. “What was ‘absent-present’ and ‘more than’ in the collaborative makings in Julie and Ava’s classrooms? There were slippages in what counts as literacy” (Ott et al., forthcoming). Standards do the story-telling for us. But, “Surely students are the authors of their own stories” (Kelly MacAlpine, in Ott, MacAlpine & Hibbert, 2018). Knowing that assessment narratives are embodied, the ethics of participation in telling stories about what we know is highly undervalued in most assessment frameworks.

6.3.3 Space, time and matter give dimension to meaning making

“We see through materials, act with them, and are positioned by them” (Ott, MacAlpine, & Hibbert, 2018). Speaking to literacy researchers now, it’s not clear to me that in the current emphasis on affect and embodiment, we are doing enough to attend to the matters that aren’t animated by emotion.

We saw that in the 100-minute lessons in the first two acts, the teacher was positioned by the computer-driven whiteboard to be front and center, advancing the slides and directing the discussion, while the students were pinned to their seats, eyes directed to the screen. Although both Rachel and Mary built in break-out moments for student to student talk and movement, there was much more teacher talk than student interaction. Kathy commented on the pacing of the lesson, how it felt like a “rush to writing.” Tuning out the sound allowed us to ‘see’ ways that spatial and temporal relations enact curriculum.”

Yes, there are immaterialities of desire materialized in the design of tools. But not everything is made by us, and in any case, what becomes when we act together? What space is made by the positioning of actors that are already embodied? What depth is formed through time?

6.3.4 Literacies make worlds

If you think that literacy is only about learning to read and write in elementary school, please think again. Literacies are practices for *making* meaning (Perry, 2020). There are two implications from this study of literacy practices in 21st century curriculum making. First, for educators generally, integrating big ideas and competencies across subject areas

is not a new idea in curriculum making, but it has always been a challenging one. This research contributes to a conversation about the challenges of teaching and assessing competencies that travel across the curriculum writ large without thinking about how different disciplines perform different competencies. Thinking about literacy practices as divergent and convergent inquiries in making connections, finding evidence, and making new practices can help teachers participate in performing multiple formative spaces for learning.

Finally, and here I am speaking specifically of the Ontario elementary education context, it is time for a fresh look at the Language curriculum (last updated in 2006). What has changed, and what still needs changing through our curriculum making in the 21st Century?

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Appendices

Case:	Time	Space	Bodies	Materials	Other	Questions
Date: Image:	Duration: pacing pauses	room arrangements, positioning, movements around objects, structure of materials, lighting	gaze, gesture, movement, expression	what's in use/not in use	context of before/after, other things noticed	
Sound Off						
Sound On						

Video Inquiry Guide 1



Western University Non-Medical Research Ethics Board
NMREB Delegated Initial Approval Notice

Research Ethics

Principal Investigator: Dr. Kathryn Hibbert

Department & Institution: Education/Faculty of Education, Western University

NMREB File Number: 109443

Study Title: Collaborative Designing of Assessment and Curriculum to Support 21st Century Learning

NMREB Initial Approval Date: August 01, 2017

NMREB Expiry Date: August 01, 2018

Documents Approved and/or Received for Information:

Document Name	Comments	Version Date
Western University Protocol	Received July 21, 2017	
Assent	Assent form	2017/06/09
Recruitment Items	Email	2017/07/05
Letter of Information & Consent	Educator LOI and Consent	2017/06/09
Letter of Information & Consent	Parent/Guardian Letter of Information and Consent	2017/06/09

The Western University Non-Medical Research Ethics Board (NMREB) has reviewed and approved the above named study, as of the NMREB Initial Approval Date noted above.

NMREB approval for this study remains valid until the NMREB Expiry Date noted above, conditional to timely submission and acceptance of NMREB Continuing Ethics Review.

The Western University NMREB operates in compliance with the Tri-Council Policy Statement Ethical Conduct for Research Involving Humans (TCPS2), the Ontario Personal Health Information Protection Act (PHIPA, 2004), and the applicable laws and regulations of Ontario.

Members of the NMREB who are named as Investigators in research studies do not participate in discussions related to, nor vote on such studies when they are presented to the REB.

The NMREB is registered with the U.S. Department of Health & Human Services under the IRB registration number IRB 00000941.

Ethics Office _____ Chair or delegated board member

EO: Erika Bastie ___ Grace Kelly ___ Kathryn Harris ___ Nicola Morphet ___ Karen Gopaul ___ Patricia Sargeant ___

Ethics Approval 1

Curriculum Vitae

Mary Ott

Education & Awards

Western University | Master of Education | 2016
The John Dearness Memorial Award, 2016
The Art Geddis Memorial Award, 2015

Western University | Special Education Specialist | 2007
 Nipissing University | Bachelor of Education | 1996
The Carl Sanders Scholarship, 1995

McMaster University | Honours Bachelor of Arts, English | 1995
The Humanities Medal for Special Achievement, 1995
The Ella Julia Reynolds Scholarship, 1992
The Dean's Honour List, 1992-1995

Graduate Scholarships

Joseph-Armand Bombardier Canada Graduate Scholar Doctoral Scholarship
 September 2018 – August 2020

Ontario Graduate Scholarship
 September 2017 – August 2018

Publications

- Hibbert, K., Ott, M., & Swift, J. (in press). Assessing teacher candidates for professional practice. In J. Kitchen & D. Petrarca (Eds.), *Initial teacher education in Canada*. (2nd edition). CATE polygraph. Ottawa, ON: Canadian Association of Teacher Education.
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Conference Presentations

- Ott, M., & Hibbert, K. (2020, May 31-June 5). Surface and filter: Participating with Google in digital literacies. [Paper presentation]. Canadian Society for Studies in Education [CSSE], Western University, London, Canada. <https://csse-scee.ca/conference-2020/> (Conference cancelled)
- Ott, M., Cristancho, S., & Apramian, T. (2020, June 24-26). Safe in my hands: Theorizing practice embodiment through situational mapping [Paper presentation]. Qualitative Conference. Brescia University College, London, Canada. (Conference cancelled)
- Ott, M., Apramian, T., Cristancho, S., Lingard, L., & Roth, K. (2019, September 25-26). Safe in my hands: Procedural variation and the entrustment of surgical practice [Paper presentation]. Canadian Conference for the Advancement of Surgical Education (C-CASE). Ottawa, Canada.
- Ott, M., & Hibbert, K. (2019, April). Assessing 21st century literacies: Improvisation and inquiry [Paper presentation, Division K, section 1]. American Education Research Association [AERA]. Toronto, Canada.
- Ott, M., Cristancho, S., Apramian, T., Lingard, L. A., & Roth, K. (2019, April 14). The sociomaterial implications of procedural variation for assessment in competency-based medical education [Paper presentation]. Canadian Conference in Medical Education [CCME]. Niagara Falls, Canada.
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Ott, M. (2014, May). “Growing success” between a rock and a hard place: A critical discourse analysis of the Ontario Ministry of Education’s policy on formative assessment [Round-table presentation]. Canadian Society of Graduate Students in Education (CSGSE) at CSSE. Brock University, Ontario, Canada.

Teaching Experience

Instructor, EDU 505: Introduction to Education Research [online]
 MEd Program, St Francis Xavier University Faculty of Education | July 2020
 Course Coordinator, EDUC 5013: Research & Assessment
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 Teaching Assistant, EDUC 5013: Research & Assessment
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 Elementary Teacher, Kindergarten – Grade 8 and Special Education
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Research Experience

Research Assistant | Schulich Centre for Education Research & Innovation | 2018 – 2020
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