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Magic and Monsters: Collaborating with Google in Literacy Practices

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Abstract

Collaboration is one of the defining features of work and learning in the 21st century. Yet despite the proliferation of Google apps and devices for collaboration across North American school systems, the scope of research on student collaboration using Google technologies in elementary school settings is limited. This paper presents findings from two cases in grade five classrooms where teachers were experimenting with using Google Docs and Chromebooks in their literacy programs. Drawing on a conceptual framework of sociomaterial, complexity, and affect theories, the study offers insights for teachers to understand the complexities of collaboration with these technologies, and pedagogical implications for working with the magic and monsters of unintended effects in collaborative literacy practices.

Keywords: collaboration, Google Docs, elementary school, unintended effects

Introduction

“We’re all going to be on the same page, because you need to learn how to work as a team.”¹

Expectations for technology afforded collaboration are finding their way into elementary literacy curricula. For example, a foundational literacy outcome in one curriculum document states that students will collaborate to create digital text (Nova Scotia, 2021). There is a motivating narrative to the discourse of 21st century learning, promoted globally by agencies such as the Organization for Economic Development and Cooperation (OECD). It goes something like this:

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.

¹ Ava, teacher participant: Names of participants in this study are pseudonyms

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 for the OECD, 2013, para. 2 - para. 16)

What matters in this learning scenario is the importance of working collaboratively in an interdependent world. However, there appear to be some shadowy orchestrations behind the scenes. It doesn't take much digging into current research on the use of technology in education to uncover corporate commitments to the sale of digital literacy and collaborations in surveillance capitalism (Dijk, Poell, & Waal, 2018; Harwell, 2022; Williamson, 2017). We know 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, in what ways, and to what effects?

In 2006, big tech companies such as Microsoft and Google began an arms race of sorts to corner the market of North American school districts, offering free or discounted suites of corporate-branded products and services (Dessoiff, 2010). Google's strategy was to make an end-run around educational administrators to recruit teachers directly as brand ambassadors in its Google Educator program, then find a new market for its Chromebook by packaging it for education systems loaded with Google apps (Singer, 2017).

Google has also sought partnerships with education researchers. For example, the authors of a whitepaper on equity in technology applications hosted a workshop heavily attended by employees of Google. Shadowy machinations are suggested in the authors' comment:

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 may be that education systems took on more than they bargained for in the deliberately disruptive approach that Google took to gain entry (Singer, 2017). Are we collaborating with a monster? What are our responsibilities as literacy educators?

Latour (2012) reflects in his essay on technology and Frankenstein that we are always making monsters with technologies – the problems arise when we don't tend to the unintended consequences. Kuby, Spector, and Thiel (2019) write in their introduction to "Posthumanism and Literacy Education" that literacy pedagogies make monsters too. They remind us that the unintended effects of our pedagogies may take hold in disruptive or invasive ways, but they can also be wildly imaginative and full of new possibilities.

Here, 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? To frame this problem, we illustrate the unintended effects of collaboration using Google technologies in two cases drawn from a broader study investigating literacy practices in elementary classrooms (Ott, MacAlpine, & Hibbert, 2018; Ott, 2020). In this study, we invited six junior elementary teachers to re-design a literacy curriculum based on Shakespeare's play, "A Midsummer Night's Dream." Using characters from the world of Shakespeare's play as monster metaphors, we describe the mayhem, mutation, and magic that ensued, embodied, and escaped in these cases. We then discuss how theoretical orientations that engage with affect and complexity thinking can inform pedagogies that tend to the magic and monsters of unintended effects in current literacy instruction. To begin, we situate the study conceptually and methodologically.

Study Background

Framing our study as an exploration of literacy practices in elementary classrooms in the 21st century signals our theoretical posture. We define literacies, in the broadest sense, as "the practices that facilitate how we engage with the world and how we come to be in and with the world" (Perry 2020, p. 2). We agree with Cannon, Potter, and Burn (2018) that separating out the digital as either an elevated or marginalized type of literacy obscures both the dominance of the screen in 21st century life, and the dynamism of literacies as always multimodal, situated, and emergent practices. Rather than taking concepts such as 21st century learning, digital literacy, and collaboration at face value, we sought to understand how literacies come together in the making, answering Latour's call to "follow the actors" (2005, p. 68). As we observed collective practices including the actors of Google Docs and Chromebooks, we turned our attention to the literature on the use of Google technologies for collaboration in elementary education. First, we review this literature to highlight the need for case studies such as this. Then, we orient readers to the theme of monsters and magic in our conceptual framework as we detail the methodology for the study design and analysis.

Google in Elementary Literacy Education

There is scant research on collaboration using Google technologies at the elementary level. A search of ERIC, Proquest, and Google Scholar databases in January 2022 using terms and combinations for 'collaborate,' 'Google,' 'elementary' or 'primary' returned six peer reviewed studies (Krishnan et al., 2018; Woodrich & Fan, 2017; Wang et al., 2021; Yim et al., 2014; Zheng et al., 2015; Ziago & Bikos, 2020). All studies featured collaborative writing using Google Docs in classrooms between grades 3 to 8. A Google Doc is an app that allows multiple users to read, write, and edit a shared text, synchronously or asynchronously, on shared or different devices. All but one study used measures of writing quality as the primary focus of investigation. Some of these studies also investigated student motivations to use this app collaboratively (Krishnan et al., 2018; Woodrich & Fan, 2017), while one focused solely on motivation (Wang et al., 2021).

Writing quality and motivations have been the objects of a wider literature on collaborative use of Google Docs in second language learning contexts at secondary and higher education levels (Akoto, 2021). Overall, the scope of the literature base offers little to elementary literacy educators in terms of how to engage collaborative use of Google Docs pedagogically or for purposes beyond writing instruction.

Research on the use of Google tools in elementary education is also limited. Two papers by the same research group (Zheng et al., 2015; Yim et al., 2014), report on a year-long study of collaborative writing using Google Docs where all students were provided 1 to 1 use of laptops in all grade six classrooms of a school district in Colorado. Despite the vast amount of data generated, the results failed to show a positive correlation with improved student achievement on the state's writing assessment. The authors nevertheless promote the study as promising. A third study (Krishnan et al., 2018) shares a collaborator from the Colorado study (Yim), along with a co-author who conducted research contributing to the use of the *suggested edit* feature in Google Docs for collaborative authorship (Wang et al., 2017). That study, aptly titled "Why users don't want to write together when they are writing together" is prescient of some of the student experiences we describe in our findings. In the research by Krishnan and colleagues (2018), one of the measures included software developed by Wang to visualize amounts of contribution to a Google Doc. However, as Wang and colleagues admit (2017), quantity and quality of writing contribution do not go hand in hand.

In summary, studies on collaboration in literacy practices with Google technologies in elementary school settings have been limited in terms of the focus on writing and insights for pedagogy, and the connection of Google to research in schools may also be a limitation. There is a need for more expansive literacy research on how students collaborate using Google tools in elementary classrooms. In our study, we use the shorthand *collaborative literacy practices* to describe this work.

Methodology

The conceptual framework for this study draws on sociomateriality, complexity, and affect orientations to study the monsters and magic of unintended effects in collaborative literacy practices. A commonality in this framework is attention to the emergence of unintended effects in practice. The theories we draw on share a perspective that reality is in the making, a dynamic, reconfigurable, and sometimes unpredictable set of relations through which the universe unfolds (Barad, 2007; Davis & Sumara, 2006; Kuby, Spector, & Thiel, 2019; Latour, 2005; Suchman, 2007). The following framework provides the structure for the study design, analysis, and implications.

The methods of observation and analysis for this study are first informed by Suchman's (2007) ethnographic, sociomaterial studies of human-technology interaction (2007). This program of research theorized how bodies of humans and technologies are configured by relations at their interface, with effects that sometimes marginalize human actors. Suchman's work treats questions of emergence, embodiment, and unintended effects in situated practice with technologies. Similarly, Kuby, Spector & Thiel (2019)

make the case for posthuman approaches to literacy research that seek understandings of the agency of more than human actors and more “care-full” (p. 236) attention to who and what emerges through these practices.

Considering emergence, complexity theories developed in studies of biology, mathematics, and computer science offer explanations for the emergence of phenomena that cannot be predicted by their initial state (Osberg et al., 2008). Davis and Sumara (2006), who played a key role in demonstrating how these theories can be generative in education research (Cochran-Smith et al., 2014), offer complexity thinking as a set of conceptual tools for destabilizing many commonplace ideas about classroom practice. One such tool we apply analytically is an understanding of the vitality of de-centralized forms of organization that allow for group interaction to exchange information and make changes without top-down control. As Davis and Sumara indicate (2006), the effects of de-centralized organization have pedagogical implications for collaborative learning.

Finally, the field of new literacy studies affords a rich engagement with the situated effects of materials in literacy practices, including technologies (Cannon et al., 2018; Kress, 2006; West, 2019). But this field is also expanding its analysis to the role that immaterialities such as affect can play in literacy practices that are unpredictable and indeterminant (Burnett et al., 2014). Leander and Boldt (2013; 2020) have done much to raise awareness of the effects of *affect* – that which moves us through emotion, energy, or desire, in their exploration of literacies that disrupt notions of intentionality. In this way, attention to affect in literacies engages a study of emergence, in how these practices “arise, take shape, and unfold in the moment” (Burnett & Merchant, 2020, p. 4). Understanding how both material and immaterial actors affect literacy practices may help teachers position themselves in the pedagogical potential of these moments.

Participants and Data Sources

Six junior elementary teachers (grades 4 and 5) and assenting students (averaging 20 students per class) from 2 school districts in Southwestern Ontario, Canada, participated in the 21st century literacies project. Following institutional ethics approval, the teachers were given access to an online literacy program being developed for junior elementary students: *Quality Writing in Literacy Learning (QWILL)*, which is based on Lois Burdett’s work teaching reader response and writing practices through the plays of Shakespeare to children in elementary school. The literacy curriculum in this study featured Burdett’s adaptation of “A Midsummer Night’s Dream” as a mentor text (Burdett, 1997). The teachers were invited to re-design the curriculum and its materials with the practices and technologies available as resources in their classrooms (New London Group, 1996). Although all the teachers used at least one Google technology in the study at one time or another, if only to ask students to ‘google’ for information, we focus this paper on two cases where grade five teachers, Ava and Julie, were experimenting with new literacy practices that involved student collaboration using Google Docs and Chromebooks. In

sociomaterial research, sites of experimentation, change, or troubleshooting are ideal for observing the makings of practice (Latour, 2005; Suchman, 2007).

At the time of data collection, schools in the district Julie and Ava worked in did not have funding to provide 1-to-1 technology for students. Chromebooks and charging stations in sets of ten were available for classrooms to book. Depending on the day and time period, a teacher might have access to enough Chromebooks for all, or just enough for students to share. In the cases in this study, the majority of students were sharing these laptops.

The method of data collection was video inquiry (Ott, 2020), a multimodal, sociomaterial, and relational approach to inquiry with participants. The first author attended one to three times per week during the literacy instruction blocks over six-month periods in each classroom, observing and asking the students and teachers questions about how they were using and making changes to the literacy curriculum and materials. These observations and conversations were recorded in short video field texts.

Analysis and Representation

Using an inquiry guide (see Appendix), the first author re-viewed the video field texts two or more times, first with the sound off, then with sound on, to afford close attention to materials, movements, and talk in how these literacy practices took shape. Preliminary findings were shared with the research team and further analyzed through a process of visualizing concepts about how the immaterialities of affect can materialize with unintended effects.

To represent the findings, we story, in present tense, what emerged through collaborative literacy practices in vignettes about the cases named “Making Memories” and “Making Sense.” We also acknowledge the entanglement of the first author as an actor in this study (Author, 2020), and write in first person about her engagement in the inquiry. Storying the findings in these ways may help readers to sense the movement and energy in these cases. For the purposes of tracking teacher and student actors through the vignettes, we opted to use pseudonyms for the teachers and numbers for the students to indicate turn taking in conversations (S1, S2). Numbering the students also de-centers their individuality somewhat, another purposeful move to notice configurations of human and material actors in different instances of collaboration.

While the story of “A Midsummer Night’s Dream” is not the focus of this research, its use in the literacy practices we studied affected how they unfolded and inspired our ways of seeing. For readers not familiar with Shakespeare’s comedy, it features human characters who stumble into a world ruled by fairies. Puck is a main character, a trickster fairy who disrupts the human characters, turning events to his own advantage and transforming one of them, named Bottom, into a donkey temporarily. Although the play takes this unexpected turn, Puck’s disruptive affect brings characters who were in conflict together in the end. In the findings, we use the characters of Puck, Bottom, and the Fairies

as metaphors for the mayhem, mutation, and magic of unintended effects in classroom collaborations.

Findings

We invite you to search for three monsters romping through the vignettes. These monsters are 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. After each vignette, we discuss how affects of difference and disturbance, random change, and other unseen, unpredictable elements had unintended effects in these cases, likened to mayhem, mutation, and magic. In the spirit of “A Midsummer Night’s Dream,” we call these monsters Puck, Bottom, and the Fairies, illustrated in Figure 1: Monsters in Collaborative Literacies with Google. Following the findings, we discuss implications for pedagogies that can notice, invite, and play with the complexities of affect and effect in collaborative literacies.



Figure 1. Monsters in Collaborative Literacies with Google

Making Memories: May Day Planning

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 webpage and clicks on the link for the Doc. In another pairing, a Chromebook sits partway between the desks of the students, but it’s not an even 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 “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. The other partner wants her to include a 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 devices 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 gets up in a huff to put the laptop away.

Meanwhile, Ava keeps one eye on the students as she circles around the room, frequently looking and monitoring the information on the IWB: “Looks like this is coming together really quickly... Can someone find a video of people dancing around a May Pole? Good! What other videos can you find about activities on May Day?”

I continue circling around the room, recording short videos of different pairings but keeping my focus nomadic so I can study the collective process. When I later re-view these videos and pay close attention with the sound off, I see that I have unwittingly documented an ongoing struggle between one pairing of students, in three different 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 comments on different points that need to be edited in the Doc. The boy stretches his arms up and out as if yawning, then slides his arm toward the Chromebook

on his partner's desk, 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 the Chromebook forcefully back 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:

Ribbons – can someone move that point next to the one about the May Pole?...
flower garlands, cut and paste that up with the flower baskets, dancing, we've got that...write poems – ooh I like that! Archery competition – that could be hard...
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 be the Lord of Misrule and boys can be the Queen. As Ava turns her back 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!!

When May Day arrives, I come to document the celebrations. The class spends 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, dressed in white, festooned with floral garlands and head-dresses – and sporting nerf guns. Instead of an archery competition, May Day ends with a glorious 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!" Ava agrees that an important part of her pedagogy is making memories.

Puck

Here is a possible headline for the May Day story: *Mayhem Ensues as Students Plan for May Day*. 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 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 tension between order and disorder characterizing Puck’s role in Shakespeare’s play is also the lifeforce 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 afforded some push and pull in how students worked out their problems of access to meaning making: “click undo!” and, “one of you has to put the Chromebook away.” The power this gave students in terms of choice and control may have led to disadvantage for some. The question remains how to care for the monster of mayhem so that it keeps its playful, Puckish quality.

Next, to take this further, we decenter human agency collaborations with Google Docs and Chromebooks with use of the term bodies. First, in the vignette, we used gendered pronouns for the students in the vignettes strategically to highlight that control of access does not fall neatly into male/female categories. Next, take this further, de-centering human agency in collaborations with the Google Doc and Chromebook, through use of the term bodies.

In this case, the body of the Chromebook pushed student pairings into a cascade of relational decisions about configuring their bodies to make meaning with and through it (Davidsen & Christiansen, 2014). For example, Burnett (2014) speaks of how the materiality of a laptop screen may “position students as audience” (p. 199). This relation is effected both materially, by the agency of the screen as a projected display, and immaterially by the students’ past experiences of watching movies and television. Other student/screen embodiments where students engage in more movement and collaborative interaction are possible with horizontally placed touchscreens (Higgins et al., 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). Suchman refers to these relations as configurations to highlight the dynamic process which actively and continuously reconfigures, or embodies, sites of human, machine and interface in situated practice. The software design of the Google Doc is another interface, for example, a human-machine reconfiguration with

features such as *undo* and *suggested edit* developed as iterative responses to user demands for protecting intellectual property in co-authored text (Wang et al., 2017).

In the design of the Google Doc, we see how human-machine configurations are embedded in much vaster and hidden sociotechnical webs of labour. 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 human and technology actors are networked in a mutually constitutive set of relations that embodies the party. We can’t re-member this May Day without the bodies and networks of the Chromebook and the Doc.

There is a third disruption we want to make about classroom collaboration, concerning the complexities of conflict and struggle. A creative collaboration is a complex phenomenon that emerges unpredictably. A complex system has vibrancy; a completely stable and predictable system lacks life (Davis & Sumara, 2006). Plan a party with others again, and there will be different tipping points. In this version of May Day, a student struggled long and hard to make a single contribution. Their “nerd war” idea was almost overlooked and vetoed. But it came at the right time to be the sticking point. The best collective decisions often emerge through some friction, an observation Davis & Sumara (2006) attribute to Surowiecki (2004). Here, they point to the “enabling constraint” (Davis & Sumara, 2006, p. 147) of controlled chaos –structure with room for randomness, as essential for complex forms of collaboration.

In other words, we need some Puckish mayhem and productive struggle in classrooms. This can be a hard pill for teachers to swallow when they are trying to support students. For example, the boy who wanted a nerf war has a learning disability. Sometimes teachers pair students who struggle with reading and writing with those who are ‘stronger.’ Perhaps this student 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 of access to meaning making in collaboration leaves off.

Making sense: Character maps

Julie sits the class on the floor in front of the interactive whiteboard 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 whiteboard 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 [drawing tools in a Doc].” A student whispers loudly: this is going to be awesome!” Julie continues:

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 Chromebooks or other devices to work with. 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. The students have choice in who to work with and where, so friends work together, leaning in close 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.

Julie: 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 remember another, asking his friend for a prompt. 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 notebooks – and if you don't know how to spell ‘Egeus’ you can look it up – don't forget you're on the internet as well.” The partner jokes and grimaces, “Watch my face when I say Eee-gee-us!”

I scan my video camera around the room again. Two partners are working so closely together that one leans on the other's shoulder, watching while her friend adds something to their drawing. The friend slides the Chromebook over to her for a turn while they

exchange a smile. As I turn away, I notice another pair of students leaning towards a shared Chromebook, but locked in a struggle. A boy with his hands on the keyboard leans his elbow into his partner's space, effectively boxing out access. He is trying to move a line in their map with no success, grunting aloud in anger: "URRHHG! I hate this! Dumb thing!!" The partner reaches a hand in to try to help, but he shoves it away.

Julie has been circling about the room and her focus continues to be how the students are problem solving to find 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 notebook]. 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 students are sharing the laptops, in a few configurations students each have a Chromebook but are working together. Three students are clustered around a table so they can work side by side, yet they don't try to coordinate what to work on in the virtual space of their shared Doc. One of them says to me: "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 is looking at a different site also featuring names of the characters from the play.

The last pair I record are also working on a shared screen, but this is a computer desktop positioned at the front of the class, against a wall. This means this pair has their backs to the class and are further away from other interactions. The student with the keyboard adds coloured ovals to encircle different characters in what looks like a complicated love knot.

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

Student 3: We made it up as we go [her partner agrees], we think that red symbolizes hatred, but we don't know – [looks at partner] who should we put Duke Theseus with?

Student 4: With Egeus because they're friends, so it's green.

Student 3: Ok, and green symbolizes [the partners finish this thought together] friendship!

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 effect relations between the other characters. Through no will of his own, his affect swirls through the world of the play, playing a role in the plot’s resolution. Where can we find the shape shifting, happenstance, monster of random variation affecting the collaborative literacies in the story of “Making Sense”?

Intentions in how to proceed with mapping the character relationships shape shifted as the students collaborated in proximal groupings. One group asked about finding spellings for the character names, and Julie and nearby groupings got swept into this process. When the researcher asked Julie what she noticed about the different kinds of collaboration, a momentary eddy from this stream of meaning making swirled off, as Julie tried to surface how the students were relating to the technology and to each other: “technology has some frustrating aspects... how are you including your partner’s voice?”

The inclusion of voice was sometimes a process of passive attunement to other voices, randomly selected through proximity and shifted to other locations. At other times, it was an affective motivation, as students desired to control or share the meaning making. Working on individual laptops in a shared Doc didn’t necessarily promote collaboration. Although the students in this case chose who and what to work with, in contrast with the forced choice in the case of “Making Sense”, we still found that some groupings were combative or indifferent to one another, others harmonious.

Spatial configuration also had material agency in the work of making sense. In the pairing with the most complex and divergent form of mapping character relations, the happenstance that they were working in a unique arrangement with backs to the class, less attuned to neighbour groupings, participated in this making.

In their critique of what is assumed about designs for meaning making in the theory of multiliteracies, Leander and Boldt (2013) point to that which is not designed – the role of chance, whim, and desire in literacy practices. They find Deleuze and Guattari’s (1987) notion of how affect brings forth *compositions of desire* helpful to include in a pedagogy for literacies:

What emerges that was not premeditated? ... 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, 2013, p. 39).

In the vignette of “Making Sense”, we see how collaborative literacies emerge through configurations of desire. While Julie gave her students some materials, a starting point, and a purpose for the task of character mapping, there was space for choice, chance, and change. We also see the work in assembling these practices: the difficulty for teachers to stay “in the pedagogical moment” (Leander & Boldt, 2013, p. 39) without falling into passive attunement to the nearest bodies, the physical and emotional labour it takes for students to collaboratively make meaning, and within these efforts, the silent agencies of materials and affect.

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 shift to understanding literacies as emergent practices, scholars 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. From mathematical modeling of emergence, we also have this understanding of the more:

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)

Second, while the nerf war more-than, or absent-present in the collaborative practices in Julie and Ava’s classrooms? First, there were slippages in what counts as literacy. What if literacies were conceptualized as affects that move us through emotion and memory? Then, indeterminate and immaterial as they may be, making memories counts as literacy practice. While the nerf war can be pinpointed as one student’s written contribution to the May Day party, this meaning making was more fully a collaborative effect of relations of struggle in a configuration of human and technology actors. Then there were also the magical, absent-present monsters – affects that exceeded or escaped understanding, chance effects that emerged unpredictably. A smile, a touch, a friend saying, “watch my face when I say Egeus!” – these had nothing to do with “making sense” of character relations. And yet they had something to do with effecting collaborative actors.

In these collaborative interactions, then, there were complex intra-actions (Barad, 2007; Suchman, 2007): students, technologies, literacies emerging through practice. This is also more than teachers can attend to. To be in the pedagogical moment, they must make

what Kuby, Spector, and Thiel (2019), drawing on Barad’s theory of intra-action, would call response-able cuts in the phenomenon to notice and work with.

Implications: Pedagogies for Monsters and Magic

Faced with complexity, unpredictability, and indeterminacy in collaborative literacy practices, what can we offer as response-able pedagogical moves for teachers? Scholars describing emergent pedagogies suggest starting from a stance that recognizes that the monsters of unintended effects can’t be predicted, but they can be anticipated, even welcomed (Kuby et al., 2019). 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); and *played with*: “Play as a way to see and act with potential in situations, self, and other(s)” (Macintyre Latta, 2012, p. 6).

Inviting, noticing, and playing with affects and effects are pedagogies of response-ability to what emerges through collaborative literacy practices. From our experience in this study, we think that noticing might be the hardest for teachers to do. Beyond the obvious limitation of tending to many things at once, there are challenges posed by shifting foci, passive attunement, and the effects of not-noticing. How might teachers in this study and classrooms like them care for the monsters ensuing, exceeding, and escaping from collaborative literacies with technologies?

Tending to Conditions

Julie and Ava made space for the noise of variation and interaction that is necessary for complex practices such as collaborative literacies to emerge. As Osberg, Biesta, and Cillier (2008) suggest, difference is an essential condition in making space for emergence:

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. (p. 324)

We are not suggesting that difference only emerges through conflict, or advocating that aggressive behaviour be encouraged as a way of breaking ground for collaboration. But at the same time, the struggle over access to the Chromebook that went unnoticed by Ava in “Making Memories” became fertile space for the May Day nerf war to emerge. A careful pedagogy of collaboration tends to the conditions for productive difference.

Active Attunement

Paradoxically, one such condition is that there are some things teachers will not-notice. Not-noticing is not necessarily a dangerous pedagogical monster. It is an absent-presence that can have both positive and negative effects, as we saw in the case of “Making

Memories.” In the case of “Making Sense,” not-noticing had a positive effect in a pair of students collaborating to make sense of a complicated set of character relations. But not-noticing can also take the form of passive attunement to the nearest available energy source, and become careless. For example, Julie’s invitation for students to play with different ways of mapping character relations was distracted by her attention to how they were figuring out the character’s names.

We are advocating for active attunement, and that requires care-switching. In their review of research on teaching collaboration, van Leeuwen and Janssen (2019) describe how students “mirror” two possibilities for the teacher’s focus (p. 79). When teachers focus their attention on the content of the task, studies show that students attend to the requirements of the task. When teachers provide feedback on collaborative behaviours, students 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 projects forward, showing the effects of attention – marks on a screen, marks on bodies, that emerge from an apparatus for observation (Barad, 2007). Teacher noticing is not the only source of observation in a classroom, but it is an affect with significant material consequences. Teachers can experiment with different cuts (Barad, 2007; Kuby et al., 2019) in what they care about; different foci of attention, different ways of noticing. What might have happened, for example, if Julie had spent more time surfacing the trouble of including the other’s voice?

Bodies in relation

Tending to the unpredictability of what emerges through collective 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... 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)

This description of an improvisational approach to “collective exploring” resonates with our findings concerning how teachers can tend to the unintended in collaborations with Google technologies in literacy practice.

We think that the strongest move teachers can make to leverage affect in collective explorations is to notice what Tanner and colleagues describe as the “energies being exchanged” (2020, p. 15). Looking at the illustration of the cases in our study from the widest possible angle, we can only sense these energies – unpredictable, sometimes

uncontrollable affects of mayhem, mutation, and magic. But in Figure 1, we can see the energies exchanged through the configurations of bodies – Chromebook screens, Google Docs, students, and shared literacy practices. Sometimes, the monsters of unintended effects make productive difference. Teachers can care for collaborative literacy practices by tending to bodies in relation.

Conclusion: Monsters and Magic

This research, which began before the beginning of the pandemic moved schools online for extended periods, ends as a love letter to the magic of interaction in elementary classrooms. We have broadened the scope of research in 21st century learning and added pedagogical insights by examining the complexities of collaboration with Google Chromebooks and Docs in literacy practices. Unintended effects caused by differences and disturbances, random changes, and unseen, unpredictable elements ensued, embodied, and escaped from the literacies in this study. While these monsters can be disruptive, we showed how they are also a vital source of affect, motivating and energizing collaborations. We also discussed playful and response-able ways teachers can work with the unintended effects of their literacy pedagogies. Teachers must be responsive. Literacies are making the world of the 21st century.

There are ways to make sense and to make memories that are not high tech. But other studies describe how students enjoy the opportunity to work with Google technologies, and we agree. Especially now that students are accustomed to using technology in online learning, comments such as “this is going to be awesome!” are to be expected when teachers point students to the Chromebook charge cart. Eyes light up, energy sparks. Collaborating online, with 1 to 1 technology, is a different kind of collaboration than sharing technologies and working face to face, and teachers have had to develop pedagogies for both. What students enjoy in any case is the power of what they can make with Google.

Powerful tools may also seem magical because the labour invested in making them so lies beneath (Clarke, 1973; Suchman, 2007). As we conclude, we live in a world showing many cracks in the surface of things. In this time, other, more dangerous monsters in the magic of 21st century technologies are revealed: among them, exploitation of education data, dirty mining operations, unsustainable energy sources, and the viralization of uncritical literacies. As teachers and researchers, we must continually seek to understand and support response-able collaborative literacy practices.

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Appendix: Video Inquiry Guide

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						

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Mary Ott (she/her) is an adjunct research professor at Western University and has taught courses in elementary language arts for teacher education programs at Western and St. Francis Xavier University. Her research in literacy practices and pedagogies is informed by theories of multimodality, more than human agency, and complexity.

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