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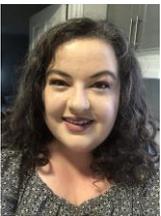
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Reconfiguring Literacies in the Age of Misinformation and Disinformation

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Abstract: Employing a multiliteracies framework, this paper explores the ways in which literacy pedagogy might respond to the emergent challenges that the new information environment poses. We contextualize literacy as a socially constructed endeavor of meaning-making that ranges across multimodal texts and has implications for identity, society, and political engagement. This paper highlights findings from an in-depth qualitative case study, examining how senior high school students and their teachers contend with the new information environment—including information abundance, misinformation, and disinformation. Drawing on in-class observations, student surveys and interviews, and teacher interviews, we offer a window into the complexities of how students and teachers grapple with information at school and, in the case of students, their personal lives. Finally, we discuss some of the opportunities for future literacy pedagogy. We contend that, in order to be responsive and authentic, literacy pedagogy should seek to address: the changing ways students engage with information; the complexity of ideas of safety and risk; the potential for socially-situated multiliteracies pedagogy; and, finally, the possibilities for future research and development.

Keywords: disinformation, literacy pedagogy, misinformation, multiliteracies



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Introduction

High school students are uniquely positioned as consumers and producers of a seemingly limitless landscape of information and media. As active users of social media platforms (Anderson & Jiang, 2018) who have not known a world without the internet, the adults in their lives run the risk of making assumptions about what young people know, and do not know, about navigating digital worlds. As digital citizens, students are tasked with navigating misinformation, disinformation, and information abundance in both curricular contexts for research-based school assessments, and in their own personal engagements with social media and information sources. These contemporary phenomena have caught the attention of critical literacy scholars, who have highlighted the importance of criticality for young people's engagement with media texts (Begoray et al., 2015; Higgins & Begoray, 2012; Jaffe et al., 2007). Questions of what it means to be critical are further complicated through the tensions that accompany living in the post-truth era, which is characterized as a time in which definitions of truth and fact are contested and politically influenced, and ". . .where appeals to emotion are dominant and factual rebuttals or fact checks are ignored on the basis that they are mere assertions" (Suiter, 2016, p. 25). In this study, we were concerned with exploring how critical and multiliteracies apply to students engaging with news media, social media, and information sources, with specific consideration of mis- and disinformation (Bacon, 2018; Barton, 2019; Janks, 2018; Osborne, 2018).

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In this study, we examined the ways in which students access and interpret information online in a time when definitions of objective truths and facts are publicly and politically contested, and in which mis- and disinformation (MDI) is furthered by digital tools, such as algorithms and filter bubbles. We investigated how existing curricula and pedagogies are providing, or failing to provide, students with the tools to navigate an ever-changing information landscape, guided by the following research questions: What are students learning in school about navigating information online, and how do they interpret meaning from those lessons? What do students think they should be learning in school about information sources, social media, and the news? What do teachers think they should teach and what supports do they need to address gaps in their own understanding? The research team embedded themselves in a senior English classroom at a major, urban public high school in Canada to conduct an in-depth case study. Findings indicate that while students received some instruction on navigating information and virtual landscapes, their learning about MDI and multiliteracies was largely limited to basic pragmatics and safety of use. Students expressed a desire for more critical engagement with digital content, as well as opportunities to build practical, holistic, and transferable literacy skills that they can apply in their lives beyond school. Teachers similarly expressed that they were inadequately equipped to incorporate multiliteracies pedagogies into their practice in meaningful ways, and called for greater professional development opportunities and curricular reform to supplement their individual efforts. This paper shares findings from this study with a purposeful emphasis on students' and teachers' voices to inform

suggestions for further scholarship in this area, as well as curricular interventions to work towards a multiliteracies pedagogy that accounts for the contemporary challenges that young people face when navigating an overwhelming information landscape.

Theoretical Framework

Young people in Canada are increasingly able to access information through news networks, social media, and information sources that are imbued with various political values. While news sources have never been neutral, it is important to acknowledge that traditional news media are held to journalistic standards for publication, while social media present an opportunity for indefinite, unfettered production and consumption of content. This access to unvetted information, paired with rapidly changing social and political landscapes, illustrates the importance of responsive pedagogies that engage with the intricacies of how young people interpret and create meaning from information sources in a globalized and technological world. This project is therefore informed by the New London Group's *A Pedagogy of Multiliteracies: Designing Social Futures* (1996), which highlighted the significance of linguistic diversity and multimodality in a rapidly evolving world. Cope et al. (2000) describe multiliteracies as "a different kind of pedagogy . . . in which language and other modes of meaning are dynamic representational resources, constantly being remade by their users as they work to achieve their various cultural purposes" (p. 5). Westby (2010) furthers this thinking by identifying emergent multimodal ways of creating meaning and proposing that increasing global connectedness and the prominence of cultural and linguistic diversity are two key factors that propel multiliteracies.

In response to new forms of social exclusion within shifting capitalist economies, Cope and Kalantzis

(2013) expanded upon their original concept of multiliteracies, noting that

a pedagogy of multiliteracies may go one step further to help create conditions of critical understanding of the discourses of work and power, a kind of knowing from which newer, more productive and genuinely more egalitarian working conditions might emerge. (p. 100)

Barton et al. (2000) call for better understanding of the various literacies and skills needed for meaning-making across differing social contexts. Kress (2003) advocates for new ways of conceptualizing how meaning is made and extracted through the 'mode' through which information is communicated, and the genre being explored therein. Kress (2003) defines genre as "that category which realizes the social relations of the participants involved in the text as interaction" (p. 88). Kress's framework is helpful for this study, as participants' social relations to the multimodal media texts that they encounter are crucial to understanding how MDI implicates student relationships with information, and the ways in which social media influences their developing concepts of self and identity. This study is also informed by research that upholds multiliteracies as essential for students to become increasingly literate citizens in what some scholars have deemed a "knowledge society" (Conceição et al., 2001; Masuda, 1980; Schumpeter, 2006).

Finally, this research builds on scholarship that details the pedagogical possibilities of critical literacies (Lankshear & McLaren, 1993), digital literacies (Gilster, 1997; Lankshear & Knobel, 2008), and Freire and Macedo's (1987) conception of literacy practices as a crucial element of an emancipatory pedagogy (Giroux & McLaren, 1991; Luke, 2012). We designed our research questions alongside Lankshear and McLaren's (1993) goals of critical literacy which

highlight the ways in which social practices, when paired with conceptions of reading and writing, enable engagement with “the politics of daily life in the quest for a more truly democratic social order” (p. xviii). We work with Lankshear and Knobel’s (2008) positioning of digital literacy less as a set of skills to be mastered and more as a complex set of sociocultural practices that “insist on careful evaluation of information and intelligent analysis and synthesis” (p. 2). We explore how digital and critical literacies apply to students’ engagement with information sources, specifically with consideration to MDI (Bacon, 2018; Barton, 2019; Janks, 2018; Osborne, 2018). Crucially, we recognize literacy as a significant aspect of emancipatory pedagogy which works to liberate marginalized peoples from oppression, including the oppressions of capitalism, fascism, and colonialism. In this vein, we see the work of responding to MDI as a necessary response to the exploitations rife in digital and social media worlds, which spill over into the real world with terrible consequences, including rampant COVID-19 mistrust and politicization, and assaults on democracy producing violence.

Review of the Literature

The New Information Environment

As both news media and social media platforms have become saturated with misinformation and disinformation over the past decade (Au-Yong-Oliveira et al., 2019; Finneman & Thomas, 2018), it has become increasingly difficult for consumers to discern truthful information from dishonest and unsubstantiated commentary (Flew, 2019; Levak, 2020). In this paper, we use the term “the new information environment” to describe this virtual meaning-making space characterized by information abundance, misinformation, and disinformation, and by the possibility to be both consumers and producers of information (Jenkins, 2006).

Misinformation is defined as information that is contrary to the consensus of the expert community (Swire-Thompson & Lazar, 2020). This phenomenon has been increasingly apparent during the COVID-19 pandemic, as an influx of daily reporting has given rise to false information about science and public health policies circulating through social media channels (Kouzy et al., 2020; Leeke & Thiruvengataswami, 2021). This new information environment is also characterized by disinformation, or the intentional use of digital platforms to propagate inaccurate information by special interest groups that target social media users with disinformation to serve political, corporate, or ideological interests (Hameleers & van der Meer, 2020; Peterson, 2017; Swire-Thompson & Lazar, 2020; van der Linden et al., 2017). Although consumers still seem to trust traditional news more than sources who promote their content through online environments, two thirds of consumers access the news through algorithmic distribution via social media (Martens et al., 2018). The use of algorithms, filter bubbles, and selective exposure to digital content has rapidly increased social media users’ access to, and engagement with, misinformation and disinformation (Sumpter, 2018; Zimmer et al., 2019). These influences have made it possible for users to find information that confirms their personal beliefs and values through selective exposure and confirmation bias, which has led to increased political polarization (Spohr, 2017; Tucker et al., 2018), risks to public health (Bin Naeem et al., 2021), and changes in human behavior (Sumpter, 2018).

Lives Increasingly Lived Online

Social media use amongst teenagers is a highly influential and pertinent part of their daily lives. According to a Pew Research Report (Anderson & Jiang, 2018), 95% of teenagers have, or have access to smartphones; nearly half the teenagers report being online on a near constant basis; and 24% believe that

social media has a mostly negative influence on their lives. Rideout and Robb (2018) found that 73% of adolescents access two or more social media applications a day. Mao (2014) found that 58% of students log onto their social media accounts many times a day. Mao's study also suggested that not only are students using social media as a form of entertainment and social engagement, but are also using it in order to access information. Teens are using social media to find interest groups (Lacasa et al., 2016; Lacasa et al., 2017;), join virtual communities (Harlan et al., 2014), become embedded in echo chambers (Nee, 2019), and develop entirely distinct literacies through their online identities (Greenhow et al., 2019; O'Keefe et al., 2011). This shift into the virtual environment means that teenagers are connecting with each other both locally and globally in new ways, and using innovative forms of digital engagement to communicate. Digital platforms and social media have opened avenues for students to explore their personal interests and build new communities online in ways that were previously impossible. This shift also means that they are engaging less frequently with their peers in "real world" contexts (Twenge et al., 2019). Additionally, the change engenders questions of how students reconcile their in-person and digital identities, and how these elements of the self may differ. The increased presence of teenagers' lives lived online also renders them increasingly disconnected from school. This corresponds with Sampasa-Kanyinga and Lewis' (2015) finding that high levels of social media use are correlated with lower levels of school engagement.

Literacy and Identity Formation

While the ways in which young people's engagements with media texts have changed as new forms of media and self-representation have taken root, media scholars have long interrogated the influences of media messaging and question their impact on

society. Gerbner's (1969) cultivation theory examines the ways in which sociocultural ideologies are internalized by consumers through mass media:

Mass production and distribution of message systems transforms selected private perspectives into broad public perspectives, and brings mass publics into existence. . .they are supplied with selections of information and entertainment, fact and fiction, news and fantasy or "escape" materials which are considered important or interesting or entertaining and profitable (or all of those) in terms of the perspectives to be cultivated. (p. 140)

In a 1994 study, Brown et al. claimed that "[adolescents] use media and cultural insights provided by [the media] to see both who they might be and how others have constructed or reconstructed themselves" (p. 814). Contemporary scholars echo these findings across studies that examine the impacts of social media and digital engagement on young people's identity formation processes, with attention to the intricacies of self-expression and self-presentation online (Chittenden, 2010; Gleason, 2016), relationships to marginalized identities (Kelly, 2018; Mayhew & Weigle, 2018), and identity formation implicated by social relationships with their peers (Boyd, 2007; Lalonde et al., 2016; MacIsaac et al., 2018). Lalonde et al. (2016) determine that "It was through identifying and sharing their everyday experiences that the young people were able to simultaneously develop their own unique online identities and to also develop a sense of common purpose as a group" (p. 52). These researchers conceive of identity formation as "identity tableaux," in which young people's virtual lives compose a significant portion of their identities. Interestingly, because this shift into digital life is largely generational, most educators do not share these identity formation experiences. This poses a

challenge for how teachers can understand, support, and engage with their students' full identities. It also suggests that students are navigating these spheres, building their identity tableaux, with limited guidance.

Extending Multiliteracies Research and Student Voice

While educators, school administrators, and researchers have expressed concerns that social media and teenagers' continual access to online spaces can be a distraction and hindrance to their learning at school (Andersson et al., 2014; Rainie & Wellman, 2012), they simultaneously acknowledge that social media's infinite reach into all aspects of life make it impossible to ignore. It is at this juncture of identity formation, new modalities, shifting meaning-making strategies, and myriad challenges that there exists an opportunity for further multiliteracies development. Drawing on social constructivism, Greenhow and Lewin's (2015) research advocates for meaningful integration of social media into both formal and informal learning. There is also an emerging body of research that considers how educators can respond to the new information environment through enhanced literacy pedagogy surrounding social media, multiliteracies, and information literacy (Bezemer & Kress, 2008; Canady et al., 2020; Farmer, 2019; Loomis, 2018; Parker, 2020). Luke (2018) and Tierney (2018) find that multiliteracies pedagogies can be particularly useful in supporting students to navigate news media and information in a political climate characterized by post-truthism, suggesting that there is room for multiliteracies research to incorporate more students' voices as a pathway towards a more ethical, social-justice oriented, and participatory engagement with media texts. Finally, when thinking of multiliteracies methodology, in a recent scoping review of research that examines social media use amongst teens in relation to school contexts, Dennen

et al. (2020) found that 51% of the 224 articles that they examined were focused on high school students aged 14-18, but only one third of all studies examined used qualitative research methods. This signifies an opportunity to develop in-depth qualitative research that highlights the perspectives and lived experiences of students and teachers to develop increasingly nuanced and textured insight.

Methodology

This research took the shape of an in-depth, interpretive case study (Glesne, 2011), with the researchers embedded in a classroom in a public high school in Toronto, Canada. Data was collected through a series of in-class observations, student work artifacts, photographs from the classroom, student surveys, semi-structured interviews with students, and semi-structured one-on-one interviews with teachers. We were particularly interested in triangulating the data between our in-class observations, surveys, and interviews. Survey questions addressed how students engage with information for school and personal use, and how they participate online more generally. We asked students how they search for information to complete school assignments, decide what to read online, and make decisions about reliability. We asked them to identify how they learn about current events, how much time they spend using social media daily, and which social media applications they use.

In keeping with Miller and Glassner's (2016) finding that "in-depth interviewing is a particularly useful method for examining the social world from the points of view of research participants" (p. 56), we designed the study with independent interviews of both students and teachers. The participant pool comprised three teachers and twenty-three students, 12 female-identified and 11 male-identified. All participating students were sourced from one senior English class, and participating teachers taught

subjects in English, social sciences, and the humanities. We would also like to note that our positionality is important for this level of granular study. We are both trained classroom teachers with working experience in the same diverse urban area. Dr. Lana Parker, the primary investigator has over a decade of in-class experience teaching language and literacy. Kristy Smith also has several years of in-class teaching experience with adolescents. Our dual lenses as teachers and researchers offer unique insights into the analysis of in-class experiences, and provided us with a range of strategies to engage students and teachers in dialogue.

Data collection began with in-class observations as the students and the teacher launched a critical literacy focused research project. The researchers documented observations of student discussions and student work, and engaged in casual conversations with students focused on the strategies they used to locate information for their group and individual research projects. The researchers also made note of the teacher's talk, actions, and resources as the educator introduced the project and conducted one-on-one student conferences at the mid-point of the project. We made particular note of students' and the teacher's engagements with technology as this featured substantially in the classroom experience and overlapped with the research questions.

Following our observations, we conducted one-on-one interviews with the classroom teacher to gain a sense of their experiences with how students locate and interpret information to better understand how they plan for, instruct, and assess research practices. We also asked all three participating teachers about their perspectives on how students engage in digital environments both within and outside the confines of the school, and what impacts they felt social media had on students' lives. Since a significant component of the research asked questions about what is (and what is not) happening in the classroom, it was useful

to gain a sense of the teachers' experiences with students' research, trends they have observed as classroom teachers, and critical (digital) literacy practices they have employed. We also surveyed the students to get a better sense of their social media and news media habits, following these surveys with small group interviews and one-on-one interviews to uncover more insight into the students' out-of-school practices, preferences, and learning. In addition, a basic analysis was conducted using Ontario, Canada's English language curriculum documents across grades 1-12 (Ontario Ministry of Education, 2006, 2007a, 2007b). At the time of data collection, we were able to conduct in-class observations and administer student surveys at the school in person. Schools were closed due to the COVID-19 pandemic shortly after this time, and we therefore facilitated interviews with students using the school mandated Google Meet platform with the support of their teachers. We conducted individual interviews with teachers either over the phone or through Google Meet. All participants represented in this article have been assigned a pseudonym to ensure anonymity.

Data Analysis

Data was analyzed in tandem by the authors through methodological triangulation and thematic coding (Creswell, 2012; Glesne, 2011; Nowell et al., 2017), facilitated through the qualitative data analysis software NVivo, a secure application that allowed us to code our data and identify connections between findings from student datasets and teacher datasets. All of the data were analyzed using data coding and thematic analysis (Glesne, 2011). Borrowing from grounded theory, we employed constant case comparison methods (Glaser, 1978) to unearth the differences and similarities in how students and teachers talked about their experiences and beliefs. This approach was helpful in holding apart tensions between perspectives, uncovering nuance in context, and revealing underlying complexities. We began

with an analysis of our field notes and in-class observations, looking for evidence of students' and teachers' engagement in online literacy practice. This included noting and describing behaviors when finding information online for a class research paper, students' discussions of groupwork assignments, and observations of students' online behaviors (e.g., what kinds of search terms and search engines did they use? What was their rationale for these?). We had informal conversations with students as they worked together in groups to understand which strategies they used for locating information and why. We then introduced data from surveys to build a more complete student profile. Specifically, we compared students' self-described online behaviors and levels of social media engagement with our in-class observations to determine if patterns observed in class were reflected in their personal experiences.

Lastly, we coded interviews to develop contrasts and similarities between in-school learning and personal engagement, as well as to develop comparisons between students' and teachers' perspectives by situating these testimonies in conversation with each other. As we analyzed the students' and teachers' stories, coding enabled us to ask "What is being illuminated? How do the stories connect? What themes and patterns give shape to [our] data?" (Glesne, 2011, p. 194). We coded according to several broad themes and then developed subcodes in support of those themes, including discussions of pedagogy and curriculum, experiences of in-school learning, personal engagements with social media, and the new information environment. In keeping with this approach, we present our findings thematically through highlighting voices and stories that give shape to the themes identified. All data sets have been anonymized, and quotations have been edited lightly for clarity.

Findings

The findings are explored in this paper through the prism of the multiliteracies framework, including the foundational understanding of literacy as socially constructed, shifting, and multimodal; the significance of power dynamics; and the urgency of critical literacy in the new information environment. The findings respond to questions of what students are learning in school, what they think they should be learning, what teachers are doing in their pedagogical practice to respond to the influx of misinformation and disinformation, and areas in which teachers felt they were failing to meet the rapidly changing needs of students who are engaging with the new information landscape. In examining the data in relation to these areas of inquiry, we illuminate the ways in which both students and teachers construct meaning as they navigate these emerging pedagogical priorities together. Our findings provided us with an understanding of the similarities and differences between how students engage with information at school and in their personal lives, the ways in which students interpreted the literacy education they received through a discourse of risk, and how teachers are reflecting on their pedagogical practice in relation to everchanging digital environments.

What Students Learn in School

We first found that, while students were receiving some direct critical, digital literacy learning in school, they were not consistently transferring that learning between classes or to at-home contexts. When students were asked how they assess the reliability of information online, they offered two significantly different kinds of responses: how they locate information for school assignments and how they locate information to serve their own personal interests outside of school. For their in-school learning, the students noted that their choice of

strategies was largely influenced by their teacher's expectations and direct instruction.

Felipe: It kind of just depends on your teacher, but most of the time I don't really find myself asking too many questions, right? I kind of just get straight to the point as to the expectations of the teacher.

Charlie: In class, we talked about the differences with sources when you're looking online. It's preferable to look for sites that end with .org for more reliable content. So, I know it's important to divide where you should be looking for your information.

Here, both Felipe and Charlie suggest that they use strategies mostly in response to direct instruction and clearly communicated expectations by the teacher, and that these don't always transfer from one course to the other. We saw evidence of students using or discarding strategies throughout our in-class observations as well. The students were likely to revisit strategies or review their approach critically if the teacher engaged them in conversation about it directly, as we observed during one-on-one student conferences. If the teacher asked about how and why they sourced information, the students returned to the strategies discussed in class (e.g., seeking expert voices from credentialed employers or institutions, using URLs to gauge a website's validity, and seeking multiple sources to confirm facts).

When they discussed how they assessed the reliability of information they engaged with outside of formal schooling, their strategies for identifying truthful and factual information did not reflect any of

the strategies they used in school. In their survey responses, students reported that they frequently clicked links that appeared on their social media feeds in order to learn about current events. Due to the accounts that they follow on Twitter and Instagram, the students' most accessed news sources were largely informal and targeted to a younger audience, including Vox, BuzzFeed, and local Instagram and Twitter accounts known as 6ixBuzz. Additionally, when asked how they made decisions regarding truth, validity, and reliability, students described how they were more likely to believe something if the text was supplemented with an image or video. They also noted that they frequently relied on volume to discern truth. That is, the greater the number of people saying the same thing, the

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greater the likelihood of that claim being truthful. When asked if students were familiar with the terms “algorithm”, “filter bubbles”, and “echo chamber”, it become clear that most of the students had no working knowledge of technological manipulations. If they had some nascent understanding, it was largely a function of their

personal online experiments, but not explicit school instruction:

Felipe: You see a lot of algorithms within [social media] . . . I kind of learned about it seeking information through Reddit, right? Even on YouTube, you see how all these websites have a different algorithm to pick what can be popular, trending or just like stuff like that. That's the only reason that I would know what the algorithm was.

We also found that student learning of critical, digital literacies was not all that critical. When asked what they had learnt about online life and social media

across their schooling (including elementary grades), students stated that the emphasis was on technology's pragmatics of use, rather than the nuance of criticality. While they received some instruction about information credibility—especially as it pertains to conventional texts like books and newspapers—students recalled that most of their digital literacy learning was prominently focused on safety and pragmatics. Several of the students went on to comment that lessons about digital life at school were primarily framed through discourses of risk and privacy. Their learning about social media seemed to begin in sex education, with an emphasis on keeping themselves safe online as they entered digital spaces. When asked what they remember learning about social media at school, female students shared that their education about digital safety was largely gendered. The instruction they received about navigating online spaces was limited to warnings about not sexualizing themselves through images they share on social media:

Mandy: From what I remember, [the focus was] just “don't send nudes!”

Tamara: Exactly, [they taught about] pornography and how one thing could lead to another.

Charlie: When sex ed started coming in and they were talking about sexting and that kind of stuff, there was a heavy emphasis on safe social media use. I do not think, other than that, I've been taught too much in school about social media.

In addition to warnings about the sexualized dangers of social media use, female students also claimed that throughout their education, teachers cautioned them against interpreting heavily edited photographs of women and their bodies as reality:

Tamara: [The teachers were] reminding us we cannot believe everything on social media, you know social media portrays a perfect body, but we shouldn't listen to it. Like it's just like basic reminders here and there, but there wasn't like a lesson based on it.

Our findings suggest that most discussion on being both a critical consumer and producer was centered on issues with privacy and risk, and were tailored differently to female-identifying students. While it seems that their teachers made attempts to make their learning about social media meaningful and tailored to concerns that may affect students differently based on gender, students wanted more from their literacy pedagogy.

Students' Desire for Change

Students felt that the education they had received with respect to the new information environment was largely missing the mark. This was congruent with our in-class observations, which suggested that although teachers tried to incorporate elements of social media criticality into their teaching (e.g., an analysis of memes), these experiences were minor components of an otherwise traditional literacy curriculum. When asked what they believed was important to learn about in school, students provided a variety of insightful responses. First, students expressed a need for learning more about MDI, online scams, and assessing which news sources and social media platforms are aligned with sociopolitical ideologies. When surveyed, only 39% of participating students reported having any prior knowledge of algorithms and filter bubbles. They were not aware of how these influences shaped their online content. They noted that they have limited knowledge, usually self-constructed, about technological manipulations such as algorithms, filter bubbles, and likes. One student claimed that they had not learned any of these manipulations in school, but instead became

familiar with how they worked to promote popular content through their own engagement with Reddit and YouTube. Students additionally felt that there needed to be a more critical focus on how to access and interpret information, and specifically called for pedagogy to learn more about MDI. While most students interviewed claimed that they felt somewhat capable in their individual abilities as media consumers to distinguish truth and fact from misinformation and disinformation, they felt additional pedagogical support was needed in this area.

In addition to these broad-based suggestions, some more nuanced themes emerged through our interviews. For example, students expressed the desire for more authentic learning, seeking bridges between what they described as “real life”, and the limits of what happens in school. This is congruent with our in-class observations, where we documented higher levels of engagement (e.g., more discussion, more student involvement, and more on-task activity on devices) when the topic landed on the intersection of social media and real-world issues. When prompted, students were enthusiastic to share their ideas on what they wished to learn more about. In tandem with authenticity, students made note of the importance of transferability. That is, they wished to learn more about using digital tools and information to build practical skills that are transferable beyond the classroom to serve myriad purposes:

Felipe: I feel like social media should be used to its advantage and teach us a little bit more skills and the things that we actually need when we when we're actually out of school, right? Things like personal finance, sustainable living, human rights—because I feel it's pretty important for everybody to know their rights. I think relationship values is also something we should look into.

Students also felt that across their various subjects, there were numerous opportunities to learn more about MDI and social media that were being missed, such as exploring the reliability of information more rigorously in English and World Issues classes, and learning about the impacts of social media on children and teenagers in Parenting courses.

Female students voiced a desire for a more holistic approach towards navigating digital content, and felt that schools hold a responsibility to move beyond simplistic lessons about risks, beauty, and body image. They raised issues of self-worth, but also expressed a desire for better tools to parse information more generally:

Mandy: I think they should start teaching about how to overcome your insecurities, I guess? If you look up pictures with girls who have nice bodies and stuff, you'll kind of feel insecure and not want to post. But, also, [they should teach] how to detect if it's a scam or something. Even though like we all know how to detect it... but like not for sure, [not] a hundred percent, I guess.

Tamara: I think schools should teach about fake news and how to point out fake news and how to discover that it is fake news. Start with that, because already in school they teach about how every shape and size is beautiful, right? So, [right now they should teach] about fake news and how you cannot believe everything on social media.

Mandy's comment is interesting because it reflects her ambivalence about existing literacies. On the one hand, she tentatively expresses that “we all know how to detect” MDI, but on the other hand, she hints that there is a fear that the strategies students currently use are incomplete or unsophisticated. Tamara similarly called for a more complex pedagogy

surrounding the relationship between gendered messaging about bodies and social media. She felt that schools should move beyond discussions about how social media can impact self-esteem, and move towards a more critical lens of information and media consumption. These calls suggest that students are aware that there is more to know, lack some confidence about the practices they are using in an ad hoc manner, and desire more robust strategies for engaging with this complexity in the safety of an adult-mediated classroom environment.

In addition to more direct suggestions for learning they would like to see in schools, students also reflected on positive out-of-school social media engagements that had a substantial impact on their identities. In one of our interviews, we spoke with a student who grew up outside of Canada and had not engaged with social media until high school. Ahmed shared that engaging with social media taught him important lessons about self-care and living well after experiencing health issues and exhaustion. He later shared that social media served as an avenue for him to learn more about interpersonal skills and growth, and thought that schools could be doing more to bring these opportunities to students:

Ahmed: I started seeing some things on social media and started learning about my health. [I began to understand] that you need to focus but you need to provide some time for yourself. You need to have some rest. Before the light of the social media, I never had this [insight] and I never thought about this even in school.

I've learned from [social media] about leadership, about bringing kindness to other people. I've learned those things and I've tried to reflect it and make an impact to do those things in my own personal life. I've seen happiness in this and I'm proud of what I was

able to do. So, I'm going to say that the advantages and disadvantages of social media should be learned in school.

Here, Ahmed highlights an opportunity for schools to go beyond categorizing social media learning in silos (e.g., pragmatics of use, health classes on safety, risks, and body image), and to more fully engage with the complexity of the life online as an essential element in how students are forming their identities, values, and beliefs.

This was also evident in Charlie's reflection on the impact of social media on student identity:

Charlie: I feel like whether people acknowledge it or want to say so or not, I feel like [social media] does influence the way that we think and perceive the things around us. I feel like definitely there is a relationship and it [influences] our thought process, you know, our morals. It has so much control on that.

Despite the students' willingness to engage in conversation about what they would like to learn, and the recognition that social media can play a consequential role in identity formation, the students also expressed a general mood of pessimism that these changes could be realized in class:

Felipe: There's not much change that schools would want to do. They would like to stick to the traditional: books, reading, going to the library for knowledge and everything. Obviously, there are a lot of implementations of social media, but integrating it more within a classroom would really, you know, take the advantage of it. We would engage more and it wouldn't just be just reading in a classroom doing the same things over and over.

Felipe's comments remind us that while we employ the term "new" in describing the current information

environment, the prevalence of online engagement and social media is not a new phenomenon in lives of youth. It is their ongoing and prevalent reality. This suggests that there is some urgency to narrowing the gap between what students are doing online outside of school and what they are learning about in school. It suggests that more holistic understandings of literacy—ones that move away from a singular focus on the perceived traditional modes of reading and writing—will render learning more relevant, authentic, and impactful.

Teachers' Needs for Pedagogical Support and Professional Development

In follow up to our student conversations, we interviewed three senior high school teachers, including the teacher whose classroom we attended. They were asked about their individual approaches to addressing critical multiliteracies in the classroom, and their impressions of the effect of the changing information environment on students. Each educator shared some of the ways they address these concerns through their pedagogies. Echoing the students, teachers noted a gap between what was prescribed by both curriculum and convention, and the changing contexts of students' literacies and online engagement.

First, as they discussed their practices, the teachers acknowledged that their attempts to modernize pedagogy were a function of their own reconnaissance and ad hoc efforts. Just as students noted that they were left to their own devices to make sense of online content, so too did teachers feel that they were unsupported in their efforts to build bridges between in-class learning and students' lives.

Some of the strategies teachers mentioned and that we observed included field trips and experiential learning, hosting roundtable discussions about social media and popular media texts, introducing students to mainstream news networks, and assessing video texts from various perspectives. As an example, drawing from a political issue well discussed in online forums, Mr. Callaway asked students to use “Donald Trump is the devil” and “Hillary Clinton is the devil” as search terms on YouTube, and then critically compare and contrast the messaging of the videos they found. Teachers also shared that they made use of digital tools and texts to enhance students' digital literacy skills. These tools included online classrooms

and Mindomo, while texts included memes from Instagram and Twitter. Each teacher commented that while they gathered resources and developed their own lessons where possible, they felt that their individual teaching practices were inadequate to address the current needs of their students.

They were also concerned with how to adapt their pedagogies to suit a group of learners that primarily access the news through the Instagram and Twitter. When asked about how students engage with information online, Ms. Atkins shared that she felt students' ability to locate and assess reliable information sources was uneven. She speculated that a reason for this lack of awareness might be ascribed to teachers in the humanities failing to incorporate research skills as rigorously in their practice:

Ms. Atkins: [In English], we were really text focused and we felt like it was more the responsibility of the Social Sciences [to teach research skills since] a lot of their work

“Echoing the students, teachers noted a gap between what was prescribed by both curriculum and convention, and the changing context of students' literacies and online engagement.”

requires research. Ours really doesn't require research in the same way. So, I think we had neglected that. The strategies we saw were almost non-existent beyond Google, but that's our fault.

Ms. Atkins also felt that many educators were caught in a significant knowledge and understanding gap, failing to appreciate how teenagers now engage with media. She noted that teachers were still focused on disciplinary silos, even within English curriculum, teaching “Media Literacy” as a stand-alone using conventional texts such as magazines, newspapers, and television news.

A third theme was related to both speed and abundance of information. Mr. Callaway commented that students are able to access a wide breadth of information with little effort, and expect to find answers to their inquiries quickly and easily. This concern was echoed by Ms. Brooks, who believed that this ease of access to information, particularly through social media, created additional challenges in trying to guide students towards credible sources:

Mr. Callaway: I've seen a little trend which is: if it's easily Googled, and it's the first thing that pops up, it must be the right thing. So, I think that's one of the defaults I notice. And if they Google it and they don't get a response right away with their first initial search, then they assume the information doesn't exist. So, it's almost like immediate gratification is correct and if immediate gratification is not met, it means it doesn't exist.

Ms. Brooks: It's a very casual way of getting the information and almost very intimate for lack of a better word. And so that in itself makes it feel more real to them, right? And I think that's the piece. You're hearing [the information] in your social media so it sounds

very legitimate, but [teachers are] just asking you to sort of insert yourself in there a little bit more in terms of asking questions and challenging what you're seeing or hearing in these different spaces, right?

Teachers felt that while there were benefits to information being readily accessible for learning purposes, students were less willing to read through longer texts to locate information or spend the time adjusting their search terms to locate relevant information sources.

Mr. Callaway described a tension between an increase in multimodalities in school resources and a perceived decrease in student capacity to engage with longer, text-based content:

Mr. Callaway: The loss of the simple function of reading and the ability to concentrate. For example, I've noticed over time, I'm looking at the history textbooks [and] how they get published and there's less and less chapters, less and less material, more and more images, more and more graphs. Now that's, in one way, good. That's how the kid's mind works. But you get a Grade 12 Law class and you say, “read four pages and let's discuss” [and the students reply] “sir, that's a lot.”

It is interesting that the gain of multimodalities was held in tension with a “loss” of the ability to read. This suggests that traditional literacies foci, reading and writing, still retain prestige in the classroom, despite literature noting both the complexity and necessity of transmedia navigation (Jenkins, 2006). It also echoes students' concerns that schools are not seeking to update their ideas of traditional literacy away from what Felipe articulated as “books, reading, [and] going to the library for knowledge.”

Lastly, teachers articulated a need for increased professional development and greater access to

resources in order to better attend to the complexities of multiliteracies in the new information environment. Just as students were seeking more support from knowledgeable teachers, so too were teachers seeking guidance from experts. One teacher identified that there is a discrepancy between what skills are prioritized in the district's current English curriculum, last updated in 2007, and the reality of what students need to learn about navigating information in a contemporary context. They also felt that the prevalence of social media in their students' lives has negatively impacted how well they know their students as individuals. As students' lives and identity formation move increasingly into the virtual world, teachers in real-life school environments have fewer points of connection. Ms. Atkins also felt that this led to a widening gap since teenagers and adults seem to live in radically different worlds as per the digital age:

Ms. Atkins: I realized that all of our students were becoming inaccessible to us because we didn't understand them. Because we don't do the things that they do anymore. I mean, they've always been different. They're young. But not the way it was when I was growing up—we weren't that different from adults [as] we consumed [many] of the same things.

Since social media and virtual worlds are intertwined with how students live their daily lives and make meaning from the content they consume, teachers felt that they held a responsibility to provide a more holistic pedagogy that accounts for the myriad ways in which social media impacts and shapes students'

formations of their personal identities. Overall, teachers and students shared this desire for a better connection between students' online literacy experiences and what transpires in the classroom.

Discussion

Discrepancies in How Young People Access Information

When students were asked how they assess the reliability of information online, the strategies they reported using changed depending on whether they were locating sources for a school assignment or pursuing information at their own leisure. This finding echoes Greenhow and Robelia's (2009) claim that while students are developing critical literacy skills independently through their own engagement with social media platforms, they do not perceive a connection between their personal engagement online and their learning at school. While the students interviewed in this study showed an understanding of how to conduct research in a way that meets their teachers'

expectations, they expressed a desire for pedagogical support that helps them navigate MDI with complete criticality. This call to action from students is inextricably linked to their developing concepts of self, critical literacy skills, and the ways in which they learn and form opinions about the world. As young people are more susceptible to accepting MDI as truth (Swire-Thompson & Lazer, 2020), it is crucial that curriculum developers, school boards, and individual institutions are taking up the challenge of educating high school students in the new information environment in responsive ways. Our

“They are implicated by varying degrees of access to information and guiding support from the adults in their lives, and unless they are able to rely on learning about MDI and critical literacy at school, there is no guarantee that they will learn these skills independently.”

analysis is aligned with Hodgin and Kahne (2018), who assert that schools must prioritize access and equity within the context of supporting students' multiliteracies learning in the current information landscape.

Given that students interviewed for this study expressed that much of their knowledge about navigating information through social media platforms was self-constructed, multiliteracies pedagogies necessarily become an issue of equity. Students navigate information through their own positionalities with regards to gender, sexual orientation, racial identity, socioeconomic status, (dis)ability, and social relationships with their peers, families, and communities. They are implicated by varying degrees of access to information and guiding support from the adults in their lives. Unless they are able to rely on learning about MDI and critical literacy at school, there is no guarantee that they will learn these skills independently. This dearth in pedagogy leaves students vulnerable to accepting MDI as truth, internalizing sensational media messages, and subsequently sharing such content through their personal social media accounts and networks.

Complicating What it Means to be “Safe” Online

The first, more general aspect of online safety, involves rendering the hidden manipulations that shape online life visible and more subject to critical analysis. Mandy's assessment of having some knowledge of how to detect 'scams' echoed other findings from this study that indicate while students are somewhat able to critically question and evaluate MDI online, their knowledge and understanding is lacking. This is especially true for their learning about how digital manipulations and tools such as algorithms, filter bubbles, and echo chambers impact what content is made visible to them through their social media accounts and browsing history. Pariser

(2011) defines filter bubbles as personalized universes of information. These personalized digital worlds are created through algorithms, which collect data on users' online behaviors in order to curate digital content that will be made visible to them. This results in users seeing content that aligns with their own personal values; information that opposes their belief systems is discarded. The combination of algorithms and filter bubbles can lead to users becoming entrenched in echo chambers, where they engage exclusively with other social media users who share their perspectives, and thereby reinforcing ideologies that mirror their own.

Our findings are consistent with two recent studies in Europe that identified gaps in teenagers' understandings of how algorithmic manipulations impact their social media use (Lensink, 2020; van Eeden, 2020). Teachers interviewed in this study agreed that more instruction in this area is needed, but as they are only beginning to understand how these manipulations work themselves, it is important for them to receive comprehensive professional development so that they can more effectively serve their students who engage with such digital mediation on a regular basis. One such example comes from Kopeinik et al.'s 2018 study in Austria, in which researchers collaborated with teachers to introduce more contemporary digital literacies in response to the Austrian Ministry of Education's call for comprehensive pedagogy that accounts for the impacts of digital manipulations and social media use on students' learning. Similarly, Passe et al.'s 2018 study found that the impacts of algorithms, filter bubbles, and echo chambers pose new challenges for civic educators, and call for increased teacher support to ensure their pedagogy meets the needs of students coming of age within the shifting information landscape. They suggest an approach to professional development that accounts for teachers' questions and anxieties about radically shifting the ways in which they teach. This resonates with our findings as

the teachers we interviewed expressed similar needs in reconfiguring their pedagogy, but also cited conflicts about what constitutes good literacy pedagogy, and concerns about how to integrate literacy learning beyond the English classroom.

The second aspect of online safety that deserves more attention is how these discussions are gendered. Female participants consistently made connections between discussions of sex education at school and the first time they remembered learning about safe use of digital tools. Tamara, Mandy, and Charlie were asked what they remembered learning about social media in school, but were not explicitly asked to comment on how these lessons may have been sexualized or gendered. Their responses indicated that these students felt that the instruction they received was explicitly tied to their sexual and gender identities in some way, positioning their identities as young women as a cause for concern. This finding resonated with Dobson and Ringrose's exploration of 'sext education' (2016), which in digital spaces are seen to operate as an extension of the schoolyard, imposing a responsibility on teachers to perpetuate societal norms through guiding female students away from expressing their sexuality online. While these lessons are important in terms of equipping students with the skills to keep themselves safe on digital platforms, the messages are inextricably linked to sociocultural politics that govern women and girls' sexualities through discourses of risk (McClelland & Fine, 2006, 2008). The students also raised the issue of gender and femininity in relation to self-esteem. Scholars have noted that social media does significantly impact girls' identity development, concepts of self, and sexual presentation (Dubowsky Ma'ayan, 2012; McCracken, 2017; Ringrose, 2010; Woodcock, 2010). The findings have implications for girls' literacies and participation in virtual spaces. For example, Perry (2016) found that girls were more likely to engage with digital media as consumers, whereas boys were more likely to produce their own

content as creators. It is therefore important for educators to consider the ramifications of teaching multiliteracies pedagogy through a gendered lens, to move away from an imbalanced discourse of risk, and to engage with a holistic multiliteracies pedagogy that empowers young people as both critical consumers and producers in the digital world.

The focus on female safety and female sexualization is also interesting when held in tension with the increasing online sub-culture that targets the radicalization of young men, including the rise of dangerous rhetoric stemming from Men's Rights Activist groups (O'Donnell, 2019; Rafail & Freitas, 2019) and the increasing prevalence of incel culture (O'Malley et al., 2020). Duggen and Smith (2013) identify that incels between the ages of 18-29 years old are most likely to use social media platforms and public virtual forums such as Reddit. While the extremist ideologies of incels may not necessarily be new, the ways in which these belief systems circulate raises new questions that challenge educators' conceptions of digital safety. What do students need in order to engage critically with such content if they come across it online? How might these needs differ based on gender? How are educators preparing students to safely navigate such curated digital spaces and filtered content? What skills and strategies do students need to discern truth from MDI? The ramifications of leaving young people to distinguish reliable facts from content that stems from a place of radicalization or sensationalism are significant. It is, therefore, crucial for teachers to receive accessible information to deepen their own understanding of how algorithms, filter bubbles, and echo chambers operate, as well as pedagogical resources that they can incorporate into their teaching practice.

Multiliteracies and the New Information Environment

Students felt that there were a range of missed opportunities for schools to engage multiliteracies in more relevant and meaningful ways. When asked what they believed schools should be teaching about MDI and social media, they provided a rich variety of possibilities. Charlie highlighted the importance of critical digital literacy skills for navigating social media platforms, specifically within the context of the COVID-19 pandemic. She considered the possible ways in which different subject areas could incorporate multiliteracies to enhance students' learning and skill building, such as through learning about MDI in English and World Issues courses, and learning about the social and emotional implications of social media for children and teens in Parenting courses. Charlie's ideas echo the findings of Saunders et al. (2016) that students are already engaged in virtual social communities; as such, schools have to move away from blocking or censoring students' access to digital content (such as through setting up blocks to accessing social media websites on school computers) and move towards embracing the pedagogical potential of inviting students' digital lives into the classroom. To return to Kress's (2003) framing of genre as "... that category which realizes the social relations of the participants involved in the text as interaction" (p. 88), inviting students to grapple with the entanglements of information, reliability, and personal identity can offer them opportunities to form relationships between their learning at school

and their individual engagements with the information environment.

Approaching multiliteracies learning in a more relational and nuanced way also provides opportunities for students to empower themselves and each other through more of an understanding of how the strategies for meaning-making they learn in school can be operationalized across their lives. A recent article from *The New York Times* noted that teenager's use of social media for the purpose of social justice activism increased following the murder

“Approaching multiliteracies learning in a more relational and nuanced way also provides opportunities for students to empower themselves and each other through more of an understanding of how the strategies for meaning-making they learn in school can be operationalized across their lives.”

of George Floyd (Lorenz & Rosman, 2020). This article discussed how teenagers were using social media platforms and other digital tools to identify and reprimand their peers who engaged in racist behaviors online. In our study, Ms. Atkins described how students would engage in debates with racist users on Twitter whom they did not personally know. These complications reinforce the need for a responsive, student-centered pedagogy that equips students with the necessary skills to mobilize social change effectively, as they are already engaged in the work of digital

activism. In this vein, students interviewed in this study called for a more holistic pedagogy that accounts for the variant ways in which they engage with the world. They desired lessons that connect their learning in school to broader sociocultural issues that touch their lives, which underscores Cope and Kalantzis' (2013) argument that critical multiliteracies are crucial to forging new opportunities for justice and equity.

As highly active consumers and producers of social media and information, high school students are in a position where a curricular approach that forms connections between personal engagement, practical skill-building, and academically informed critical analysis furnishes new opportunities to dismantle oppressive structures (Cumberbatch & Trujillo-Pagán, 2016; Green, 2020). Youth are already involved in this work, mobilizing and supporting social justice initiatives such as Black Lives Matter through social media platforms. As such, a more rigorous and responsive multiliteracies pedagogy holds the potential to empower youth to work towards more hopeful and equitable futures.

Gaps in Pedagogy and Research

Teachers in this study consistently felt that the individual efforts they made to respond to the rapidly changing information landscape were insufficient. This corresponds with concerns raised amongst both scholars and teachers about the challenges of responding pedagogically to changing notions of what constitutes relevant literacy practices, and mobilizing “new learning” when the skills that young people need in the present differ greatly from those in the past (Kalantzis & Cope, 2012). These challenges have also been documented by other scholars interested in multiliteracies and multimodalities (Boche, 2014; Crockett et al., 2011; Tompkins et al., 2014). Despite the lack of curriculum supports, multiliteracies pedagogies—and the innovation they offer—are essential in navigating news media and information in a political climate characterized by post-truthism (Luke, 2018; Tierney, 2018). Cope and Kalantzis (2015) refined the four pedagogical components of multiliteracies put forth by the New London Group in 1996 to reflect knowledge processes of experiencing, analyzing, conceptualizing, and applying. This demonstrates how multiliteracies can be responsive in offering a more contemporary approach that addresses new forms of

communication and meaning-making, as well as the pedagogical challenges of responding to emergent technologies. What is important, then, is not to achieve perfect pedagogy, but to continue to expand the definitions of what counts as literacy.

There are ample opportunities for future scholarship to expand upon this work through a closer examination of teachers’ and preservice teachers’ practice. Additional research could investigate how teachers might be supported in cultivating new frameworks through which to think with expanding definitions of responsive multiliteracies pedagogies, as well as to reflect upon the ways their own engagements with information shape their perspectives. Teachers in this study also signaled the importance of professional development and pedagogical resources that they can use to better serve their students as both educators who teach content and skills, and as adults who take care of young people. Training that helps teachers connect with the ways in which young people are using social media and virtual spaces may help them to build meaningful relationships with their students. It may equip teachers with a greater insight into what high school students need as they traverse digital worlds and negotiate the implications of such engagements on their identity information, understanding of the world, and perspectives on what they are learning in school. As both the teachers and students in this study noted, both groups are largely combatting these pedagogical challenges on their own. Therefore, it would also be beneficial for these issues to be taken up with some curricular focus, so that there is more than a piecemeal or ad hoc response to this universal challenge.

Conclusions

Our findings indicate there is room to engage multiliteracies in response to the new information environment and that both students and teachers

desire a more critical pedagogy that bridges the gap between traditional in-school learning and the literacy experiences that students are cultivating online. Teachers are eager to develop pedagogies that address the needs of their students, connect with their online and real-life identities, and help students cope with the demands of MDI as consumers and producers. Students, while somewhat capable of navigating the intricacies of an overwhelming information landscape, are asking for an education that intentionally engages with MDI, social media, digital manipulations, and the implications of such phenomena on students' beliefs, values, and

decisions. Together, teachers and students in this study proffered valuable considerations for how pedagogical practices can equip young people with the skills to thoughtfully participate in disseminating knowledge and engaging in communities online. In the post-truth era, adults are susceptible to the impacts of accepting misinformation as legitimate; for young people with digital lives that adults know little about, it is imperative that they have access to an education that empowers them to approach the new information environment with rigorous criticality.

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