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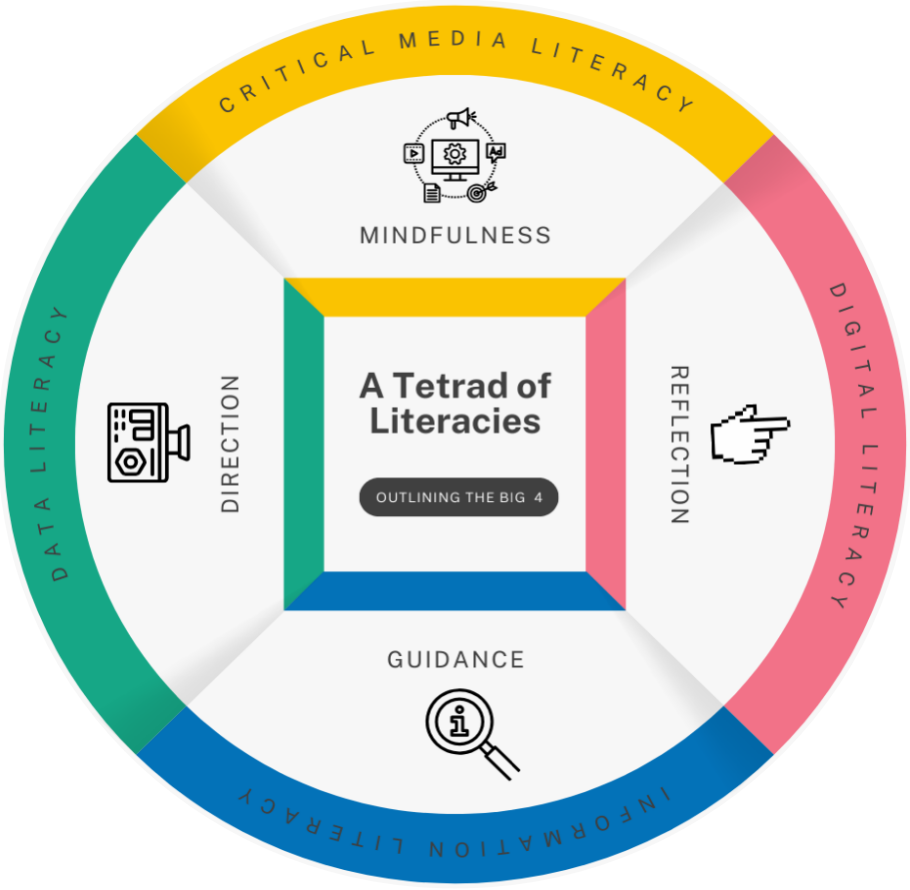

Exploring the Current Implementation and Use of Commercial Platforms in Canadian K-12 Education and the Tetrad of Literacies as a Working Policy Response

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EXECUTIVE SUMMARY

Objective

This white paper aims to provide a detailed review of how EdTech is currently being implemented and employed in the K-12 education system in Canada. Based on this review, a draft of several policy responses originating from the proposed Tetrad of Literacies, a working conceptual framework, will be outlined as a way to initiate further reflection around the goals of democratic education.

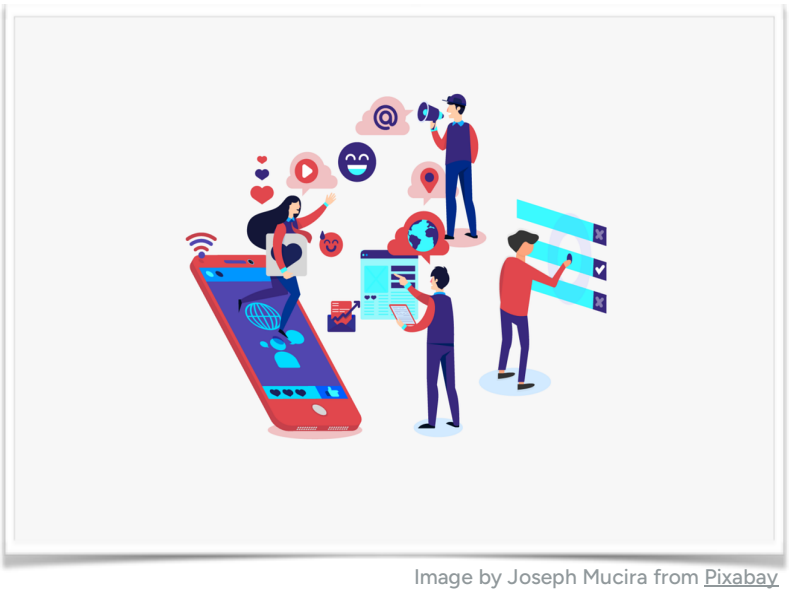
Goals

Overall, this white paper intends to document the viewpoints of experts in the field of educational governance and technology, including but not limited to, Williamson (2015, 2018), Pangrazio (2019), Pangrazio and Selwyn (2019), Pangrazio and Sefton-Green (2020, 2022), and Selwyn (2014), who have studied the broad implications. Accentuating previous literature in the field will offer a frame of reference and direction for subsequent research to be conducted while also making the case for certain provisional policies around educational governance and technology, through the Tetrad of Literacies, to be further administered in Canadian schools.

Proposed Policy Responses

Specific policy responses will originate from the working Tetrad of Literacies framework, which includes the following four: critical media literacy, digital literacy, information literacy, and data literacy skills, in particular, to increase aptitude in these areas. Although the proposed Tetrad of Literacies framework is open to iteration, at this preliminary stage, it intends to facilitate a heightened awareness of the limitations and affordances of using educational technology platforms, in addition to increasing educational stakeholders' proficiency in optimally and equitably using these platforms.

INTRODUCTION



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To live in a society where digital and technological aptitude are presumed to be inherent is not likely to facilitate a sense of collective empowerment or identity. Instead, to address the current tensions that exist between digital platforms and the manipulation of users' data, critical media literacy education, specifically speaking to the problems posed by datafication, must be developed amongst stakeholders who find themselves at the crux of this issue. The acquisition of such skills would, in part, help uncover the comprehensive benefits of new technologies to students, teachers, educational administrators, and platform owners. Consequently, at a basic level, students, educators, parents, educational policymakers, and analysts need to possess an awareness of how the pedagogical platforms utilized in Canadian schools operate on both technical and social levels and use critical media literacy to identify ways of fostering data literacy in an increasingly datafied world. One fundamental issue faced by individuals who engage with such platforms is datafication, which is discussed by experts in the field of educational governance and technology, including Williamson (2015, 2018), Pangrazio (2019), Pangrazio and Selwyn (2019), Pangrazio and Sefton-Green (2020, 2022), and Selwyn (2014). The educational landscape has given technology conglomerates the opportunity to insert themselves into the sector under the guise of philanthropic, transformative technologically-mediated endeavours (Selwyn, 2014; Patil, 2021); however, the primary problem is the collection of students' learning-based and personal data (Regan et al., 2016, p. 1). More notably, the ways in which learning platforms are promoted by ubiquitous and influential technology conglomerates are generally enticing, reaping many potential benefits for students. It is, therefore, a valuable practice to conduct further in-depth inquiries into how these platforms are impacting stakeholders in education and students in particular.

However, within the context of Canada, there has been a lack of research conducted on the implications of educational platforms used in educational organizations more broadly. There exists a need for increased research on the topic within Canada, as datafication poses social and privacy risks to diverse stakeholders. To this point, Regan et al. (2016) write that "big data applications and products raise the possibility of discrimination as a result of profiling and tracking of students, as well as uses of student information for a wider range of purposes" (p. 1). The authors express another critical point, stating the following: "With increased emphasis on the need to improve student learning, especially at the K-12 level, a number of actors are involved in marketing more sophisticated analytical products, approving the use of these products, and using them" (Regan et al., 2016, p. 1). The ideas around surveillance and privacy issues enabled by many contemporary educational technology platforms, as touched on by Regan et al. (2016), ultimately speak to the predicaments faced by many students, educators, and parents.

DATA PRIVACY ISSUES ARISING FROM EDTECH

It is beneficial to begin with a definition of educational technology, or EdTech, as it is commonly referred to. Chatterji and Jones (2012) provide a detailed explanation outlining the characteristics of EdTech:

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> Education technology encompasses (a) baseline hardware, including computers, network equipment, tablets, and smart boards; and (b) content layers, including instructional software, digitally delivered textbooks and lectures, test preparation and assessment software, and enterprise software to help manage school systems,
>
> schools, and classrooms. (p. 12)

This illustrates the multifaceted and intricate, yet highly technical nature of EdTech, as it is concerned with several aspects ranging from the construction of various technological

infrastructures to the creation of eBooks, as Chatterji and Jones (2012, p. 12) denote. This description alone makes clear the issues that might emerge from the in-depth use of various educational technologies, with key matters including datafication and privacy coming into view. When any type of technology is used, it is of immense value to consider both the affordances of the technology along with who might benefit from that specific technology. Asking these questions and engaging in a critical reflection about the digital tools available to support learning can ultimately serve as the first step in creating a conscious awareness that a mutual relationship between the user and technology is being formed.

Building on Chatterji and Jones' (2012) perspectives, Regan et al. (2016) provide a detailed explanation concerning the data privacy issues that result from the EdTech sector:

> Educational data are often stored in large, longitudinal data sets from which personally identifiable variables have been removed. These data sets are used for reporting purposes from the school to district to state or province and finally to the federal government. They are also used for research purposes to identify trends over time and to analyze factors that affect student performance. They have traditionally been referred to as aggregate, anonymized data – but this tradition is being challenged in the era of big data. (p. 5)

As described, although this sort of data is said to be anonymous, significant privacy implications are posed to students as they interact with technological learning platforms (Regan et al., 2016, p. 5). The underlying notion of surveillance and tracking that students are subjected to as they engage with these platforms, though subtle, creates concrete consequences around privacy and performance in how their data is collected and manipulated (Regan et al., 2016, p. 5). These perspectives are further augmented by Williamson (2015), who looks at how big data and datafication are currently impacting and shaping educational policy (p. 123). The author states that "digital technologies, software packages and their underlying standards, code and algorithmic procedures are increasingly being inserted into the administrative infrastructure of education systems" (Williamson, 2015, p. 123). Williamson (2015) also discusses a central idea about databases: that they "function by capturing people and things as quantifiable, encodable and machine-readable characteristics which enable them to be identified, classified, ordered or sorted through data processing algorithms" (p. 127).

With respect to the privacy issues that arise from digital learning endeavours on contemporary platforms, Davis et al. (2018) discuss information and communication

technologies (ICTs) for learning, beginning by emphasizing that school boards are responsible for managing the education system in different districts (p. 4). The authors additionally offer the following description of the Council of Ministers of Education, Canada (CMEC):

> While there is not a federal department of education, the Council of Ministers of Education, Canada (CMEC) was formed in 1967 by the provincial and territorial ministers responsible for education, to undertake educational initiatives cooperatively and represent the interests of the provinces and territories with national and international organizations and federal and foreign governments. The CMEC provides a national voice for education, and, through the CMEC, the provinces and territories work collectively on a wide range of priorities at the elementary, secondary, and postsecondary levels. (Davis et al., 2018, p. 4)

Davis et al. (2018) also explain that the increased use of ICTs for pedagogical activities has sparked conversations about students' privacy in North America (p. 6). However, it appears that there is a lack of fully developed privacy policies around the use of student data in the context of Canada, as the authors state that "The US Department of Education, along with other organizations offers schools and families resources and examples, training, and other assistance in navigating privacy concerns in the United States and Canada" (Davis et al., 2018, p. 6). Based on what Davis et al. (2018) express, there is no direct body that oversees the privacy issues concerning student data in a Canadian context.

To provide an outlook on Silicon Valley's educational initiatives, in particular, Williamson (2018) further explores the privacy issues arising from the use of contemporary pedagogical platforms. The author explains that Silicon Valley can be viewed as "a social, technical, economic, and political zone of innovation with particular aspirations to reform public education in its own image" (Williamson, 2018, p. 284). This idea, then, gives rise to the following questions: who do new technologies formulated by big tech corporations benefit? Are they more self-serving than educative and beneficial to North American students? Nonetheless, a salient detail is that Silicon Valley technology conglomerates have prominent ties to the domain of education, and this relationship has been made to emerge subtly, appearing as inherent (Williamson, 2018, p. 286).

Williamson's (2018) explanation of how startup schools, which are explained as "entrepreneurs associated with social media and web companies creating their own private schools as competitive alternatives to state schooling and models for the reinvention of public education on a massive scale," and are principally structured as" mobile fast-policy

models" and intend to promote customizable education (pp. 283, 287), is also relevant to this discussion. The author further writes that "Startup schools are supported financially through sources of venture capital and technology sector philanthropy," and their profit-driven intentions epitomize venture philanthropy (Williamson, 2018, p. 289). Lastly, Williamson (2018) asserts that startup schools funded by Silicon Valley technology conglomerates serve as spaces that support the process of trial and error (p. 296). Overall, Williamson's (2018) work allows for a reflection of Silicon Valley's insertion into the education sector, considering their profit-driven motives, which undoubtedly can have an unfavorable impact on student learning.

Lastly, in a research report written by Bayrami (2022), titled "The Implications of Virtual Teaching and Learning in Ontario's Publicly Funded Schools, K-12," the author notes that with the rise of digital learning following the COVID-19 pandemic, teachers indicated the most unease with their privacy, with students and their families showing less apprehension about protecting their privacy (p. 7). Based on this finding, it is perhaps reasonable to presume that students and their parents or guardians do not have as much knowledge of how their personal data and privacy remain at stake as a result of platform use as compared to teachers (Bayrami, 2022, p. 7). Yet, as Bayrami (2022) ultimately concludes, "the experiences of educators, students, and families in relation to virtual models of teaching and learning has been negative, with the hybrid model perceived as fundamentally flawed" (p. 7). This demonstrates that despite the lack of a comprehensive understanding of how one's data and privacy are being manipulated, there seems to be an innate sense of distrust with how EdTech platforms operate, as opposed to traditional, classroom-based pedagogical undertakings.

Elementally, as outlined in the literature exploring privacy issues arising from EdTech and implied by Regan et al. (2016), Davis et al. (2018), Williamson (2018), and Bayrami (2022), there are substantive apprehensions around the ethical use of data for student learning. The literature explored in the above paragraphs also highlights the need for additional research on the nuances of how data is being manipulated throughout EdTech platforms for learning, especially in a Canadian context. Here, a useful practice would encompass a detailed inquiry of the most used EdTech platforms in Canadian schools to determine their privacy protocols and data management operations.

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OUTLINING DIGITAL LEARNING ENDEAVOURS IN A CANADIAN CONTEXT

In Ontario, since the COVID-19 pandemic ensued in the spring of 2020, students were required to learn by using educational platforms in their home settings through the “Learn at Home” program, introduced by the provincial government (Cooper et al., 2021, p. 83; Timotheou et al., 2023). Within the context of Canada, and Ontario, specifically, this is a significant factor that led to the increased use of digitized platforms for learning, as Cooper et al. (2021) and Timotheou et al. (2023) indicate.

Contributing to the discussion regarding the shift in learning due to the COVID-19 pandemic, in the literature by Rizk et al. (2023), the implications of technologically-based learning in Canadian classrooms in light of the COVID-19 pandemic were explored. The authors note that a special“ Education Taskforce” was created to bring together the viewpoints of Canadian education experts, and that "The goal was to share lessons and strategies, ensure the successful continuation of quality learning, expand current pockets of innovation, and to consider what a “new normal” might look like” (Rizk et al., 2023, p. 90). As Rizk et al. (2023) explain, the special Taskforce showed enthusiasm about the increase in digital, platformized learning, as it could “change more traditional and outdated instructional models” (p. 97). Despite these hopes around the benefits of digitized education, an important distinction arising from this research is the absence of considering how digitized pedagogy also poses increased risks around students’ personal data and privacy.

In a policy report written by Bennett (2016), the issues arising from EdTech and the “Flipped Classroom” model and approach, in particular, is outlined in the context of Nova

Scotia (p. 4). The author emphasizes that "Atlantic Canada's leading educators are leery of the pan-Canadian movement promoting 21st Century Learning and technology-driven education" (Bennett, 2016, pp. 4-5). Bennett (2016) refers to the Flipped Classroom approach as a form of "disruptive innovation" and expresses that "blended learning activities" can positively benefit digital learning for students in the Atlantic Canada region (p. 5). The core issue with this approach, according to Bennett (2016), is the for-profit drive of the Flipped Classroom model (p. 7). As the author states in greater detail, the model was based on Salman Khan of Khan Academy's online, self-teaching approach; however, two Nova Scotian businessmen (Jim Spatz and John Risley) donated a substantial amount of money to integrate the Flipped Classroom model into classrooms to promote a significant transformation for virtual learning (Bennett, 2016, pp. 7-8). Bennett's (2016) concerns with the for-profit nature of introducing and integrating contemporary EdTech endeavours into classrooms are also echoed by Patil (2021), who examined the ways that for-profit philanthropy has impacted the education sector, specifically during the COVID-19 pandemic (p. 1). The author explains that prominent technology giants pledged funds to aid with worldwide economic recovery in light of the pandemic, consequently concealing the profit-driven nature of their contributions (Patil, 2021, p. 1).

However, there has been a positive reception towards the Flipped Classroom model, which has been documented in other research, such as that conducted by Lundin et al. (2018). The authors note that popular studies conducted on flipped classrooms indicate that their purpose is to bring in alternate perspectives through technological use to promote unique, in-depth learning about new subjects unrelated to course material (Lundin et al., 2018, p. 12). Moreover, Lundin et al. (2018) write that "The core idea is to 'flip the common instructional approach', enabling the classroom to be a place 'to work through problems, advance concepts, and engage in collaborative learning'" (p. 12). Returning to Bennett's (2016) outlook, it appears that if a specific Flipped Classroom model in a distinct province is being funded as a means to an end, other than the transformation of student learning, it can be problematic.

Thus far, in the context of Canada, there have not been significant policy implementations to counter the effects of big data and student privacy in the educational landscape (Regan et al., 2016). In a 2015 report discussing the comprehensive approaches taken towards digital learning on a provincial level in Canada, Barbour articulates that with respect to governance and regulation in Ontario specifically, the Education Act does not

have specific policies around student data privacy (p. 41). Further contributing to this idea, Regan et al. (2016) clarify that, "In Canada, there is no ministry or department of education at the federal level as the Canadian constitution gives the provincial governments exclusive responsibility for all levels of education" (p. 14). This makes clear the need for policy-based implementations that address the broader privacy and datafication issues faced by Canadian students as they engage more with educational platforms. Conrad and Veletsianos (2022) substantiate this, speaking to the absence of policy initiatives, stating: "Canada does not have a national education agency to guide policy development, guiding parameters and direction must come from elsewhere, if at all" (p. 74). Altogether, this emphasizes a gap in Canadian policy with respect to matters concerning digital privacy in the education sector (Regan et al., 2016; Conrad & Veletsianos, 2022).

THE IMPACTS OF THE "LOCAL" DIGITAL DIVIDE

Drawing on the research conducted by Cooper et al. (2020) once more, the authors explain that based on their inquiry into the Ontario government's introduction of the "Learn at Home" program, "Issues emerging in relation to equity included access to devices, access to the internet, and communities disproportionately affected by COVID-19, such as low-income families, racialized communities, and immigrant families whose children were English language learners" (pp. 83, 87-88). Timotheou et al. (2023) also highlight this viewpoint, expressing that "many schools demonstrated a lack of experience and low digital capacity, which resulted in widening gaps, inequalities, and learning losses" (p. 6696).

DeCoito and Estaiteyeh (2022) further discuss the increase in the use of EdTech platforms for learning in Canada following the start of the COVID-19 pandemic (p. 340). The authors explain that as a result of the shift from classroom-based learning to online learning, "Teachers were also provided with learning platforms (e.g., Brightspace, Google Classroom) and a handful of suggested resources to implement during this process" (DeCoito & Estaiteyeh, 2022, p. 340). Nonetheless, as DeCoito and Estaiteyeh (2022) describe, a significant aspect of being able to reap the benefits of contemporary digital learning platforms, students must possess a degree of media and digital literacy skills along with "suitable and equitable access to technology especially in emergency situations" (pp. 342-43). Accordingly, DeCoito and Estaiteyeh's (2022) research calls attention to the essential need for basic access to digital technologies, which serves as the first step in

ensuring that educational stakeholders can effectively participate in digital life, subsequently engaging in reflections on what equitable technology use might look like.

CHALLENGES IN USING CONTEMPORARY EDUCATIONAL TECHNOLOGY PLATFORMS

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The expectation that students inherently possess a proficiency to aptly navigate the contemporary EdTech platforms that are being introduced in their classrooms is not sufficient. As Timotheou et al. (2023) explain, "One of the most common challenges reported in studies that utilized digital tools in the classroom was the lack of students 'skills on how to use them" (p. 6707). The authors further articulate that a common issue is the lack of knowledge educators have about contemporary digital learning platforms if they are not taught about them beforehand (Timotheou et al., 2023, p. 6707). This sentiment is also underscored by DeCoito and Estaiteyeh (2022), who describe that teachers also require an array of resources and support to guide their own learning of how to navigate contemporary digital technologies and platforms (p. 343). This concept is supported by a recently published master's thesis that provides a comprehensive perspective, analyzing the knowledge of Ontario pre-service teachers on critical media literacy and their ability to teach the subject in their classrooms through creative pedagogy (Kowlessar, 2023). The results of this thesis suggested that for teachers to engage in more creative forms of pedagogy, both digital and non-digital, there needs to be greater support in teaching them how to use diverse resources geared toward this form of learning (Kowlessar, 2023).

This sentiment is also discussed by Hébert et al. (2021), who explore the use of digital games for learning in Ontario K-12 classrooms (p. 307). The authors explain that "digital game-based learning has been framed as one potential medium to support what has been broadly referred to as 21st century competencies, or more colloquially, the 4 Cs: creativity, collaboration, communication and critical thinking" (Hébert et al., 2021, p. 308).

When considering how digital games as forms of pedagogy could be implemented into classrooms, however, Hébert et al. (2021) indicate that after interviewing Ontario teachers about the feasibility and effectiveness of integrating games into their classrooms, it was found that these teachers did not have enough support in using specific technologies around games-based learning (p. 320). This encompassed both technological and advocacy barriers, as "Digital games will not and frankly cannot be integrated into teachers 'lesson and unit plans if classrooms do not have access to devices" (Hébert et al., 2021, p. 320). Once more, this speaks to issues around a more localized digital divide, in addition to the lack of support offered to educators as they work to learn about contemporary technologies and platforms that might augment their teaching and prove as worthwhile learning endeavours for their students.

The previous literature examined in this section then leads to the consideration of how increased education platformization creates challenges outside of the privacy realm for specified educational stakeholders, including students, educators, and parents. If teachers are not entirely well-equipped to navigate the EdTech platforms being introduced in their classrooms, their students cannot remain dependent on them for guidance, and will likely have to engage in a degree of self-learning about the given platform. Nevertheless, Timotheou et al. (2023) explicate that "Strong leadership, strategic planning, and systematic integration of digital technologies are prerequisites for the digital transformation of education systems" (p. 6711). The authors additionally write that with respect to policy, "Policy support and leadership must include the provision of an overall vision for the use of digital technologies in education, guidance for students and parents, logistical support, as well as teacher training" (Timotheou et al., 2023, p. 6711). A consequential point, this emphasizes the necessity for a holistic approach to shaping Canadian educational policy, predominantly where digital technologies and platforms are concerned.

EXPLORING EDUCATIONAL POLICY

In order to propose specific policy responses geared towards the promotion of equitable technology use and more transparent privacy protocols throughout EdTech in Canadian classrooms, it is of value to explore the broad realm of educational policy. Taylor et al. (1997) provide a detailed interpretation of educational policy, tracing its history and development over time. The authors explain that "Policies are thus dynamic and

interactive, and not merely a set of instructions or intentions. They represent political compromises between conflicting images of how educational change should proceed" (Taylor et al., 1997, p. 15). As the authors indicate, the domain of educational policy is best viewed from a comprehensive lens, where diverse characteristics are taken into consideration to create strategies that benefit those involved in the academic landscape (Taylor et al., 1997, p. 15). Another core facet of policy work is the values of those shaping the approach to education, which exemplifies how biases and blindspots may arise in projected strategies (Taylor et al., 1997, p. 15).

Further considering the complex nature of educational policy, Taylor et al. (1997) state the following: "Even seemingly self-contained school-based policies can usually be seen to be connected in some way with broader policy developments" (p. 16). This makes clear that educational policy can also be more favourably approached through an intersectional lens, where the consideration of a myriad of perspectives remains at the forefront. Fundamentally, when an array of possibilities are contemplated, and the views of various stakeholders in education are prioritized to determine how equitable learning can be fostered through technology, in particular, this allows for an intersectional approach to policy work, where multiple opinions are taken into consideration.

To contribute alternate perspectives to the broad and diverse field education policy, Bell and Stevenson (2006) "explore the relationship between the interdependent themes of leadership, policy and power" (p. 8). The authors denote that policy is an intricate topic that is influenced by an array of characteristics ranging from social to political (Bell & Stevenson, 2006, p. 23). In addition, with respect to developing education policy, Bell and Stevenson (2006) express that "it is also important to focus on the individual educational institution because this is the point that represents the interface between the wider policy environment and the individual learner" (p. 25).

In a similar vein, Anyon (2005) provides a comprehensive overview of educational policy and its development over seven and a half decades (p. 65). While the author speaks about educational policy in the context of the United States, some of the ideas discussed can be deemed universal - particularly those around the integration of social justice into policy formation (Anyon, 2005, p. 66). More specifically, Anyon (2005) states the following:

Rules and regulations regarding teaching, curriculum, and assessment certainly are important, but policies to eliminate poverty-wage work and housing segregation (for

example) should be part of the educational policy panoply as well, for these have

> consequences for urban education at least as profound as curriculum, pedagogy, and testing. (p. 66)

This encourages policymakers in a global context to consider how certain intersectional factors around socioeconomic status and inequality can be contributing factors in the journeys of educational stakeholders. Anyon's (2005) standpoints can be paralleled with those of Au and Apple (2010), who accentuate the importance of considering how power shapes policy work, and its impacts on the education system, from designing curriculum to encouraging educators to remain open-minded about different forms of pedagogy. According to Au and Apple (2010), being mindful of the role of power can ultimately facilitate growth and diversity at the policy level, as well as within the classroom for both teachers and students.

Altogether, Anyon's (2005) work underscores the need for social issues, such as those around poverty, to be actively included in educational policy, as an equitable approach is central to democratic education. This can be viewed in tandem with Kellner and Share's (2005, 2007, 2019) holistic approach to critical media literacy, where alternate factors seemingly unrelated to the study of media are taken into consideration to determine its impacts on users, and how a comprehensive approach to understanding media can lead to the development of morally-just citizens. Along with Au and Apple's (2010) viewpoints, this serves as a reminder to consider a central element in educational policy: power and its impact on students and curricula.

PROPOSED WORKING POLICY RESPONSES

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A Working Conceptual Framework: The Tetrad of Literacies: Critical Media Literacy, Digital Literacy, Information Literacy & Data Literacy

Literacies can serve as the building blocks for learning about an array of topics, and they can also prove as a useful policy implementation in the realm of education. Scholars in the domain of education have looked at how various literacies can bring awareness to and

teach different subjects. As Pangrazio (2019) articulates, “a literacies perspective helps to understand the process of meaning-making for different social and cultural groups, including a consideration of the conventions, norms, values and beliefs on their practices” (p. 18). Pangrazio and Sefton-Green (2020) expand on this, stating: “literacy is an established field that both normativises and explains the relationships between individuals and society, providing an important first step to enacting other rights and strategies to protect and manage personal data and privacy” (p. 212).

Literacies can also be diverse and all-embracing, according to Brooks and Normore (2010), who explore nine distinct literacies: “(a) political literacy, (b) economic literacy, (c) cultural literacy, (d) moral literacy, (e) pedagogical literacy, (f) information literacy, (g) organizational literacy, (h) spiritual and religious literacy, and (i) temporal literacy” in their discussion of “glocalization,” which is characterized by “the way that local, national, and global interrelationships are mediated by local, national, and political dynamics” (pp. 53-54). The nine literacies discussed by Brooks and Normore (2010) complement the intentions of critical media literacy, which is a form of literacy that embraces the unique factors influencing media use. This extends beyond general media aptitude, as a critical media literacy approach seeks to understand and apply different angles to analyzing the intentions of media, according to key scholars in the field, such as Kellner and Share (2005, 2007, 2019).

In a 2017 report titled "Digital Trends and Initiatives in Education: The Changing Landscape for Canadian Content,” Howell and O’Donnell discuss several areas of importance for learning in the 21st century (p. 7). The authors explain that these areas encompass “Literacy and numeracy,” “Critical thinking, inquiry, and problem-solving,” “Innovation, creativity, and entrepreneurship,” “Communication and collaboration,” “Metacognition (learning to learn, self-directed learning),” and “Local, global, and digital citizenship” (Howell & O’Donnell, 2017, p. 7). Once more, there are many parallels between these domains and the four literacies proposed in the provisional Tetrad, as core ideas involve critical thinking, mindful approaches to interacting with digital technologies and platforms, and comprehensive reflections about the affordances and drawbacks of pedagogical technologies.

Moreover, Hughes et al. (2015) discuss the teacher education process in Ontario, focusing on the integration of “Critical Digital Literacies and Social Equity” to propose a robust teacher training program at Ontario Tech University (UOIT), geared towards

highlighting the lived experiences of individuals and promoting a heightened sense of critical thinking (p. 439). The authors explore the concept of literacy through a pedagogical lens, stating the following:

> Literacy, as mastery over the processes by means of which culturally significant information is coded, has transformed learning and will continue to do so as learners increasingly inhabit a world of burgeoning new media through the immersive use of personal mobile devices such as smart phones, tablets, and traditional laptop and desktop computers. (Hughes et al., 2015, p. 440) Hughes et al. (2015) suggest that viewing critical and digital literacies in tandem can have a positive effect on how individuals make sense of media as an influential factor in the world around them (p. 441).

However, Pangrazio and Sefton-Green (2022) explain that it is easy to get caught in the web of literacy theories, which can interfere with the nuances of participating in digital life, specifically concerning engagement on contemporary educational platforms (p. 6). More specifically, the authors write that literacies are commonly understood as "terms used to describe the individual's capacity to understand information and the social norms and conventions that surround it, as well as demonstrate this knowledge through writing and/or activity" (Pangrazio & Sefton-Green, 2022, p. 6). All in all, this illustrates the need for a careful approach toward employing literacies as part of a policy response. In order for the literacies proposed in the working Tetrad to complement one another, there needs to be a meaningful understanding and approach to optimally employing a literacies perspective in Canadian education policy work.

Critical Media Literacy

The first literacy in the provisional Tetrad of Literacies is critical media literacy. Put simply, one of the hallmarks of media literacy involves having a curious mind and an enthusiasm for critical thinking and intellectual growth and development. Another significant element of media literacy education is the "strong impulse of care" that is embedded within the discipline (Andrango et al., 2024, p. 82). Andrago et al. (2024) expand on this idea, stating:

> Aside from the underlying value of care that drives people into the field of education in the first place – care for knowledge, student well-being, health of democracy and society, etc. – media literacy educators strongly care about vital aspects of civic life (p. 82).

As indicated by Andrago et al. (2024), care is an integral aspect of education, and life, in general, and it is a motivational force that can encourage those involved in teaching, leadership, and policy work to approach the topic in meaningful and genuine ways that might bring about greater social change and equity. Media literacy is a skillset that can be continually developed throughout one's life if there is a high level of care involved: a sense of care that primarily drives stakeholders to make the most of their experiences with media and develop their critical thinking skills.

With respect to critical media literacy, Kellner and Share (2019) articulate that it can be defined as "a theoretical framework and practical pedagogy in order to enhance individual sovereignty vis-à-vis media culture, empowering people to critically read, write, and create a better world" (p. xi). Extending this definition, Kellner and Share (2007) suggest that a critical media literacy approach deepens fundamental media literacy aptitude and skills as it encourages individuals to "critically analyze relationships between media and audiences, information and power" (p. 59). This notion is further underscored by Butler (2019), who writes that "Critical media literacy challenges students to think beyond their comfort and pleasure with media and to regularly interrogate their choices" (p. 159).

A consideration of how critical media literacy might be viewed in relation to the other three literacies listed in the provisional Tetrad is made possible by the dynamicity of the topic. This is substantiated by Kellner and Share (2019), who, to a great degree, convey that critical media literacy is a skill set that can be augmented as individuals undergo different lived experiences (p. 6). Since critical media literacy is not solely concerned with the everyday media experiences of individuals but also seeks to promote the "[development of] skills that will help create responsible citizens who are motivated and competent participants in social-political life" (Kellner & Share, 2019, p. 6), substantiates that it is an all-embracing skill that can reap benefits in several areas of media users 'lives. To Kellner and Share (2005, 2007, 2019) and other scholars in the field, possessing extensive media literacy skills can lead to a sense of empowerment to aptly use many contemporary technologies and platforms.

Digital Literacy

Digital literacy is the second type of literacy proposed in the provisional Tetrad. It is explained as a specific skillset geared towards promoting an understanding of effectively engaging with digital media materials (Pangrazio & Sefton-Green, 2020, p. 214). As

Pangrazio and Sefton-Green (2020) elaborate, digital literacy "focuses on digital media and networked interactive technologies and therefore has a broader meaning that can refer to performative and instrumental literacies as well as critical literacies" (p. 214). A key distinction with this literacy as compared to media literacy, however, is that while "both concepts are based on developing critical thinking, digital media are now networked and interactive, which requires a unique set of skills and dispositions" (Pangrazio & Sefton-Green, 2020, p. 214). Through Pangrazio and Sefton-Green's (2020) discussion, it is also made clear that "data literacy does not replace media and digital literacies, but instead builds on each to articulate the set of skills required to have agency in a datafied world" (p. 214). Demonstrated here is the idea that relevant literacies corresponding with one another can have a stronger educational component if they are viewed pluralistically instead of individually to promote a deepened awareness and understanding of how personal data is used within diverse contemporary EdTech platforms.

Information Literacy

Information literacy is the third type of literacy proposed in the provisional Tetrad. This form of literacy, as Brooks and Normore (2010) put it, is "concerned with teaching and learning about the whole range of information sources and formats. Thus the various technologies of public communication (i.e., print, internet, television, radio, etc) ought to engender information literacy" (p. 64). Much like critical media literacy, which, as Kellner and Share (2005, 2007, 2019) imply, is a dynamic and holistic skill, information literacy "is a social process for understanding, finding, evaluating, communicating, and using information—activities that may be accomplished in part by fluency with information technology, in part by sound investigative methods, but most important, through critical discernment and reasoning" (Brooks & Normore, 2010, p. 64). The critical thinking element of information literacy precisely parallels some of the core objectives of critical media literacy, such that individuals are encouraged to deeply engage with and reflect on their engagement with contemporary technologies and platforms.

Brooks and Normore (2010) move on to discuss other central aspects of information literacy, explaining that it "initiates, sustains, and extends lifelong learning through abilities that may use technologies but are ultimately independent of them" (p. 66). A subsequent point of significance is that with the rapidly evolving nature of contemporary technologies, a heightened aptitude and awareness to navigate the array of digital platforms and arenas are required to successfully gain from these technologies (Brooks & Normore, 2010, p. 66).

Nonetheless, as Brooks and Normore (2010) express, "Because the Internet is a common information and communication tool globally, IL is often understood as digital literacy in which computer literacy, media literacy, and media education are integral components" (p. 66). Overall, this speaks to the connections that link information literacy with the other literacies included in the proposed Tetrad. Yet it also makes clear that information literacy is a sole literacy that has distinguishing features geared towards specific goals for better understanding digital spaces and platforms and relevant implications, such as those around privacy.

Data Literacy

The fourth and final literacy proposed in the provisional Tetrad is data literacy. Data literacy is an interesting term that has been discussed by scholars, including Pangrazio and Sefton-Green (2020). In particular, the authors look at the significance of digital data in the education sector and how data literacy can offer a sense of autonomy to digital users (p. 208). Pangrazio and Sefton-Green (2020) offer a straightforward definition of datafication, stating that it is "the transformation of digital interactions into a record that can be collected, analysed and commodified" (p. 209). With this, Pangrazio and Sefton-Green (2020) also indicate that "regulatory responses tend to contradict the central tenet of many social media – that is, to share and connect with others. There is also evidence that tactical responses, such as blocking and anonymisation tools, compromise internet experiences" (Pangrazio & Sefton-Green, 2020, p. 212). Consequently, Pangrazio and Sefton-Green (2020) articulate that educating digital users to become digitally literate is a more effective way of promoting an understanding of personal data and how it is manipulated (p. 212). The authors further contextualize data literacy in relation to other literacies including digital literacy and media literacy; however, they write that "It is important to acknowledge that data literacy does not replace media and digital literacies, but instead builds on each to articulate the set of skills required to have agency in a datafied world" (Pangrazio & Sefton-Green, 2020, p. 214). Pangrazio and Sefton-Green (2020) ultimately conclude that additional research needs to be conducted on data literacy to determine whether it can adequately address concerns with datafication (p. 217). This signals the benefits of a pluralistic approach, much like that of the provisional Tetrad of Literacies, which draws on the strengths of viewing multiple literacies in tandem to promote greater awareness and understanding of issues that arise from an engagement with EdTech platforms.

The area of data literacy is also explored by Pangrazio and Selwyn (2019). The authors examine the term "personal data literacies" and how a deeper awareness and understanding of it might lead to greater autonomy when it comes to individuals 'personal digital data (Pangrazio & Selwyn, 2019, p. 420). According to Pangrazio and Selwyn (2019), there are several types of personal data: "data that users give to devices/systems," "data that devices/systems extract from users," and "data that devices/systems process on behalf of users" (pp. 421-22). In line with this are the ways data literacy has been addressed over time, through the following several approaches: "data safety and data management," "data science," "data hacking," and "media literacy approaches to personal data" (Pangrazio & Selwyn, 2019, pp. 422-25). The authors explain that the aforementioned approaches do not consider "many of the most important issues arising from the growing significance of personal data in contemporary society – in particular, making sense of the place of individual users within the data economy" (Pangrazio & Selwyn, 2019, p. 425). As a result, Pangrazio and Selwyn (2019) provide an in-depth discussion of "a critical framework of personal digital literacies," which includes the following five areas: "(1) Data Identification, (2) Data Understandings, (3) Data Reflexivity, (4) Data Uses, and (5) Data Tactics" (p. 428). Elementally, the topic of approaching personal data is a complex one that needs to be consistently reworked to determine how it can best serve the interests of media users (Pangrazio & Selwyn, 2019, p. 434).

A Tetrad of Literacies: Proposed Working Policy Implementations

Image created by Julianna Kowlessar

Based on the working conceptual framework of the Tetrad of Literacies outlined in detail in the above paragraphs, it is advanced that critical media literacy, digital literacy, information literacy, and data literacy can have a transformative effect on stakeholders in education, as they navigate the complex web of EdTech platforms among other digitally mediated landscapes. As demonstrated, these four literacies reap diverse benefits when viewed singularly; however, there is value in considering them simultaneously, as they complement one another and share similar characteristics. Therefore, it is of value to contemplate how contemporary Canadian educational policy can be leveraged to incorporate the facets of the provisional Tetrad of

Literacies to empower stakeholders in education. Empowerment here would take the shape of teaching relevant stakeholders to aptly navigate EdTech platforms and comprehend how students' data is being manipulated.

When thinking about specified policy implementations, it is useful to begin with small propositions and subsequently augment the given approaches to ensure that policies are benefitting Canadian stakeholders in education. As underscored in the surveyed literature in the earlier "Outlining Digital Learning Endeavours in a Canadian Context" and "Data Privacy Issues Arising From EdTech" sections, Regan et al. (2016) and Davis et al. (2018) communicate that in a Canadian context, to date, well-defined policies have not yet been introduced to mitigate the complex issues arising from big data with respect to educational technologies and platforms. Therefore, a combined approach, drawing from each of the literacies listed in the Tetrad, might encompass the following six core competencies, as a starting point, for Canadian educational stakeholders:

1. Promoting the working Tetrad of Literacies in Canadian classrooms in some capacity, either directly or indirectly, through daily classroom initiatives or through more specified learning endeavours, such as through mandatory online modules that can be completed outside of class time.
2. Considering the "local" digital divide and access to technology: an integral area for stakeholders in education to be able to equitably engage with digital platforms.
3. Teaching stakeholders in education (i.e. students, parents/guardians, and educators) how to read and interpret terms of service documents to help promote a basic understanding of how personal data is being used on EdTech platforms.
4. Teaching educational stakeholders, and students, in particular, how to apply critical thinking skills to their digital learning experiences as they engage on an array of platforms, either through academic or personal endeavours.
5. Teaching educational stakeholders about the basics of data use and privacy (i.e. What is data? How is personal data collected and utilized as a result of participating on various digital platforms?).
6. Centralizing the aspects of meaning and care as integral components of the working Tetrad of Literacies (i.e. seeking meaning through digitally mediated academic and personal experiences, caring about one's data, and reflecting on ways to increase individual autonomy).

These six core competencies were drafted based on a comprehensive consideration of the provisional Tetrad of Literacies. By combining the core principles of critical media literacy, digital literacy, information literacy, and data literacy, a holistic approach to equitable EdTech use can be reflected on by groups who are directly impacted by such technologies. While these core competencies are rather elementary and open to iteration, they serve as an adequate starting point to promote increased autonomy for stakeholders in education.

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Julianna Kowlessar is a PhD student in the joint Communication & Culture program at York and Toronto Metropolitan Universities. She holds an Honours Bachelor of Science in Psychology, an Honours Bachelor of Arts in Communication Studies, summa cum laude, and an MA in Communication & Culture from York University. Broadly, Julianna's research centres on the benefits of teaching critical media literacy education in K-12 Canadian classrooms and using games as forms of pedagogy. The research Julianna conducted for her master's thesis explored how Ontario pre-service teachers understand and approach the subject of critical media literacy to discover practical and unique methods of teaching it to their future students.

Through this white paper, Julianna explores the intricate realms of educational and platform governance, which parallel her current research on critical media literacy and creative pedagogical tools that cater to students' unique learning needs. Considering the domains of educational policy and the platformization of education in Canadian schools, Julianna hopes to advance ideas on relevant strategic responses to ensure the equitable use of technologies for learning, encouraging greater accountability and transparency from widespread EdTech platforms.

Outside academia, Julianna is an electric guitarist and an avid sports fan. She also enjoys baking and engaging in challenging activities that inspire her to explore and develop new physical and intellectual strengths.

To learn more about Julianna's research, you can view her LinkedIn page or reach her by email at jkwlsr@yorku.ca.

Exploring the Current Implementation and Use of Commercial Platforms in Canadian K-12 Education and the Tetrad of Literacies as a Working Policy Response

Julianna Kowlessar

June 2025

Media Education Lab

The Media Education Lab is an online community that advances the field of digital and media literacy education through leadership development, scholarship, and community engagement. The Media Education Lab was founded in 2003 by Professor Renee Hobbs to improve the educational practice of media literacy through educational programs, curriculum design, professional development and community outreach. The Media Education Lab also studies the best practices of media literacy education and conducts program evaluation to measure the impact of teaching media literacy using a multidisciplinary research agenda. Since the Media Education Lab is a community of learners, many educators, faculty, graduate students, and scholars join the network to increase their leadership skills and their ongoing capacity for innovation.

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