Science Fiction, Radical Democracy, and World Building: A Pedagogy of Unknowable Futures

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Abstract

The unknowability of the future implicates everyone, yet the narratives of mastery which shape *pedagogical* approaches to the future do not allow students the opportunity to explore the uncertainty that comes from ultimately unknowable futures. This dissertation therefore foregrounds the exploration of uncertainty by envisioning science fictional, collaborative world building as a space in which students can imagine contested views of the future that move beyond predicting future problems. This study occurred in two stages: first, a reflexive ethnography framed within participatory action research in one secondary-level English classroom over three months, which involved exploring science fiction (SF) with students who then mobilized science fictional storytelling to collaboratively imagine the future of Toronto; and second, a world building assignment that was designed and informed by findings from stage one and used with pre-service teachers in order to facilitate speculative pedagogical explorations as they imagined myriad potential futures of society and schooling through SF. In stage one, various qualitative methods were used to explore students' engagement with SF, the future, and storytelling, including observations and fieldnotes, a questionnaire on students' thoughts on the future, semi-structured group interviews, in-class discussions, and contributions to the collaborative world building project. Data is analyzed through thematic analysis, discourse analysis, and critical theories to gain a deeper understanding of issues of representation, power, and intersectionality in students' engagement with one another throughout the project, in pursuit of understanding how students envisioned a collective, contested future together. In stage two, pre-service teachers' world building work is analyzed through thematic analysis, with particular attention to the development of speculative pedagogies which centre futures that are open and uncertain. Informed by thinking on radically democratic pedagogy, poststructuralism, and critical theory, in addition to genre

studies within SF scholarship, this study contributes to a reframing of the future within education by moving away from the goal of mastering unknowable futures, and instead towards engaging in a collectively constructed exploration of uncertainty, and further positions SF as a promising and largely untapped resource integral to narratively navigating challenge and change.

Key Words: Secondary School Education, Secondary English Language Arts, Teacher Education, Participatory Action Research, Ethnographic Methods, Science Fiction, Futures Studies, World Building, Collaborative Storytelling, Radical Democracy, Democratic Education, Uncertainty, Pedagogy

To Gio, and our wonderful, messy, silly critters: Runner, Tux, and Atlas.

Dedicated also to all those no longer here,
and especially to Nancy Maher who I know was so looking forward to reading this.

Acknowledgements

There was a time – probably mid-autumn of 2019 – when I thought my dissertation research wasn't really about the future but was, rather, about death. On the surface, this feeling was informed by my return to students' stories from the first stage of this research earlier that year, in which young people had shared with me what felt like bold, unfiltered truths about their fears and hopes for the future. Stories through which they had shared that they were worried there wouldn't *be* a future that could possibly contain the hopes they so desperately held onto. Of course, this feeling was also strengthened by my own loss: by my father's passing during data collection; by my mother's death years prior, around the time when I first became inspired by what speculative futures offered pedagogical presents; and by the loss of my grandfather – the sweetness of an otherwise difficult childhood – a year and a half before that. These personal losses were interwoven with my complicated feelings about conducting research on the future, given how increasingly difficult I felt it was becoming to imagine a future in which we all could live when so much of the present was, and continues to be, characterized by violence and injustice.

I start with this to emphasize the profound role each person mentioned here has played in making this a dissertation that *does* engage with death, and fear, and loss, but that also moves towards an uncertain hope in its wake. This was only possible because of the love and support shown to me.

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Chapter One: Introduction

> "It's not yet the worst of times, but things are worse every day. It's far from the best of times. Harm abounds everywhere. The interrelated crises that have been with all of us for a good while are nearing conjunctural explosion. Ecologically, planetary nature (including humanity) is facing a downward spiral of near-total destruction. Economically, the global intensification of capitalism (in its latest neoliberal version) is producing the alienation and exploitation of all aspects of everyone's lives. Politically, the overdetermined matrix of corporate power, superpower aggression, and the inability of democratic politics to uphold modernity's utopian potential of justice, peace, and freedom increasingly privilege the super-rich and super-powerful even as it subjects the great majority of people around the world to intensifying vulnerability; and the consequent surge of war, disease, starvation, and immiseration combined with the normalization of enslaved and precarious work is destroying the vitality and complexity of everyday life. Legally, culturally, and existentially - accelerated by these sociopolitical depredations- a virulent xenophobia is steadily attacking humanity on grounds of race, ethnicity, gender, sexuality, age, bodily form, or other modes of perceived difference - even as fascistic politicians, regimes, and mass movements are gaining ground and feeding official and individual rage as they rise from the fetid swamp of hatred."
>
> Tom Moylan, *Becoming Utopian: The Culture and Politics of Radical Transformation* (2021, p. 1)

I begin this dissertation with the above quotation to contextualize this work. Keeping with the example that Moylan (2021) sets that any researcher that concerns themselves with dystopian and utopian thought must first address the truth of the moment, I begin with this quotation to acknowledge the profound challenge that I posed to participants in this study who were tasked with imagining the future - and future*s* - in times like this. When asked to articulate their hopes and fears for the future in the first stage of this research, young people indicated that it is an increasingly difficult task to imagine a future when one isn't entirely confident there *will be* a future worth imagining, or, possibly, a future *at all*. Although this dissertation study occurred in 2019, many of the problems that youth and pre-service teachers discussed as they used science fictional storytelling to imagine the future together remain: there are still urgent calls to address climate change amidst fears of an unlivable world; political polarization and resulting isolation; a hostile political climate resulting in explicit and systemic violence; widespread economic disparity

privileging an increasingly small number of people in Canada and around the world; and the continuing question of how social media and digital technologies do and will shape how we live together. Although unanticipated, many of the aforementioned problems worsened with the emergence of the COVID-19 pandemic less than a year after both stages of this research occurred; a pandemic that has killed over 4 million people at the time of writing this dissertation (coronavirus.jhu.edu/map.html), but that also exposed just how deeply entrenched systemic inequity, violence, and injustice are in the fabric of society.

But just as the pandemic has brought these realities to the fore—which are not new and are hardly news to anyone struggling within the violent, patriarchal, racist, ableist, classist, homophobic and generally bigoted world in which we live—it also has and continues to present material and embodied manifestations of our collective responsibility to one another, from wearing masks and physically distancing, to advocating for equitable supports in times of crisis, to navigating how to safely 'return to normal' in enduringly abnormal times amidst vaccine hesitancy and apathy over the lives and deaths of others. Taking these and other issues into consideration, questions about how we might act upon our own entanglements with citizenship have become foregrounded in our collective consciousness: what responsibility do we have towards others? What does this responsibility look like? What *should* our collective responsibility to others look like? And, pertinent to the pedagogical work that this dissertation explores: how does ethical responsibility manifest in our educational worlds and lives? In the context of broader societal change, what does teaching towards collective responsibility to care for one another look like? While this dissertation is not *about* the pandemic, this global event will necessarily influence the ways in which the stories and experiences of secondary students and pre-service teachers will be understood; a student's belief that masks will become a commonplace fashion accessory in a

climate-altered Toronto in 2049 will perhaps be met with a knowing smile. A pre-service teachers' fears in the Fall of 2019 over the impact of social isolation in an imagined, distant future when students learn entirely in isolated, virtual spaces will be met with the knowledge we hold in the future of this work - our present. With consequences of the pandemic in mind, however, the questions that this dissertation addresses remain the same, and the importance of exploring how we might imagine collective, inclusive, and difficult futures together is perhaps an even more important problem to address than it was before.

Science Fictional Imaginings, Futurity, and Speculative Pedagogy

How might we envision and pursue such potential futures? In an age of great upheaval brought forth by shifts in global politics, the increased pressures of climate change, and the sheer speed of innovation, in addition to the aforementioned contexts of the pandemic, science fictional narratives and images have become deeply ingrained in contemporary social consciousness as a way to process change. Istvan Csicsery-Ronay Jr. in *The Seven Beauties of Science Fiction* echoes this view, asserting that "[…] sf [science fiction] has come to be seen as an essential mode of imaging the horizons of possibility" (2008, p. 1). In this dissertation I make a similar claim, namely that science fiction (SF) offers readers, and specifically students, a unique entry point into thinking about the present moment and envisioning myriad possible futures. Whether it is imagining what other galaxies might hold through stories of intergalactic travel, exploring how changing the way we think about gender, race, sexuality, and other aspects of identity could impact future societies, or considering the effects that scientific discoveries or ecological decisions could have on humanity, SF can offer students an opportunity to think differently about contemporary issues and the part they play in enacting change. While the temporal positioning of science fictional narratives is a crucial part of the genre, more significant is how the future is treated as a "locus of radical

alterity to the mundane status quo" (Freedman, 2000, p. 55). The overarching exploration that drove this research focused on the potential that SF has to help students imagine and visualize 'radical alterity' and difference, to affirm that there are alternatives beyond prevalent societal narratives of the future, and to reinforce that youth are an integral part of envisioning plural, complex, and varied futures in contrast with the present, which is too often normalized and viewed as immutable. In the second stage of this research, I also explore envisioning alterity with pre-service teachers in the context of their own developing, pedagogical practice and orientation towards the future through a revised version of the world building project that serves as a foundation for this study. While this dissertation focuses largely on stage one of this research, involving a three-month long participatory action research study with one secondary English class exploring SF and collaborative world building, both the first stage and the smaller, second stage of inquiry working with teacher candidates on world building and educational futures contribute to a broad conception of what a speculative, future-oriented pedagogy might look like.

In this dissertation, the impact of SF on students' and pre-service teachers' dispositions towards change and uncertainty is explored through the concept of *speculative pedagogy*; a pedagogical approach that places uncertain, plural futures at the fore of teaching. In contrast with approaches to teaching that only make space for teaching towards what *is*, speculative pedagogy involves privileging 'what if?' questions – a mode of inquiry at the core of SF and speculative fiction (Mendelsohn, 2009) – within dynamic relations of teaching and learning. Drawing examples from the research that follows, *what if* the government was restructured to include youth in meaningful decision-making practices? *What if* we had 'robots' as doctors and nurses, as classmates, and friends, and partners? *What if* climate change goes unaddressed? In terms of education, *what if* in-person schooling is replaced entirely by online learning and artificially

intelligent teachers? Alternatively, *what if* the school was not the central hub of learning, but communities wherein the education of a child was a collective, experiential process? In this research, 'what if?' is a constant frame through which participants engage in future-oriented learning and imagining and is central to what this dissertation offers.

However, as Donna Haraway warns, it is paramount that we "[stay] with the trouble" in the present (2016, p. 4); to not allow dreams and fears of the future to inspire us to abandon the present. But what speculative pedagogy offers, particularly through science fictional and speculative storytelling, is a means through which *what if* questions can be answered through many, plural "if, then" responses (Mendelsohn, 2009, p. 13). As is illustrated by the many stories of students and pre-service teachers alike that follow, if we can ask *what if* questions, and we can map out myriad 'if then' possibilities, we might be able to act within the present towards those possibilities – even when the outcome cannot be guaranteed. Explored more in this chapter and the dissertation that follows, a speculative pedagogical orientation offers a redefined relationship towards the future, involving not just teaching how things *are*, but also making space for how things *could be*, in partnership with students whose plural perspectives, fears, hopes, and ideas about possibility offer many, inevitably uncertain, paths forward.

Democracy, Pedagogy, and Futurity

As is made clear above, in both stages of this research, but particularly in the first stage which mobilized speculative and science fictional world building with students, the conceptualization of the future was critical to understanding the role that SF can play in facilitating explorations of futurity. I frame the future in this work as a site of contestation and dissensus in the spirit of radical democracy. In this conception, the goal of democratic engagement is not consensus, but participation in the dynamic process of democracy; a continually unstable and ever-

changing political state characterized by the ceaseless disruption of pre-existing systems, structures, and views through claims for equality (Biesta, 2011; Rancière, 1998; Thayer-Bacon, 2001). Through centering dissensus and agonistic discourse, the goal of education in the spirit of democracy becomes not about conscious social reproduction of pre-existing social and political structures (Guttmann, 1993), or teaching students the entry conditions for democratic participation which Chantal Mouffe (1993) critiques. Democratic engagement instead facilitates opportunities for moments of contestation to disrupt socially-mandated parameters of engagement within and beyond traditional educational institutions and spaces.

Social Constructivism and Future-oriented Pedagogies

In this study, I employ a social constructivist view of knowledge and learning, where knowledge creation is a social process (Thayer-Bacon, 2001, pp. 5-6), and meaning is collaboratively constructed. Social constructivist views of knowledge see the learning process as a collective endeavour and as a site where fluid identities and meanings are negotiated and contested as students take on difficult ways of knowing together (Boler, 1999), thereby moving beyond conceptions of the isolated, individualized learner and traditional top-down pedagogies (Troudi, 2010; Yilmaz, 2008). Significantly, social constructivist epistemological frameworks view collaborative learning as an essential part of the learning process, where the understanding achieved in community is impossible to attain alone (Powell & Kalina, 2009). In particular, I draw from a non-cognitive model of social constructivist views on knowledge. This model is inspired by a social interpretation of Lev Vygotsky's work on development and learning, particularly those interpretations which situate learning as something which occurs in social practice and is open-ended, instead of as an act of individual internalization of knowledge and meaning (Lave & Wenger in Daniels, 2005, p. 146; Stetsenko, 2017). Knowledge is therefore socially and culturally

constructed by diverse, complex individuals engaging in active learning together *with* the teacher and each other, instead of learning exclusively *from* the teacher through processes of knowledge transmission. In this view, classroom learning poses an opportunity to explore a range of knowledges and perspectives as a community which can engage in the learning process in ways that open up, instead of foreclose upon, future possibility.

The epistemological orientation described above complements a view of the future that is dynamic, uncertain, and open to exploration, and embodies a "move away from attempts to reduce uncertainty, and instead embrace it through diverse, contrasting futures: and the need to approach not only the future but also the present in a constructivist and pluralistic fashion" (Vervoort, Bendor, Kelliher, Strik & Helfgott, 2015, p. 63). The goal of this work, then, is to consider how radically democratic, constructivist approaches to future-oriented pedagogies can offer students the opportunity to grapple with uncertainty in community with one another and engage in a process of continual becoming. As such, this study explores how science fictional world building and ways of thinking can provide a foundation through which to engage in plural imaginaries, which effectively link students' presents with prospective, contested futures.

Project Overview: World Building and Science Fictional Future Landscapes

This research centres around the concept of world building. World building is a science fictional genre convention and technique that SF writers use to design the futures in which their stories take place (Csicsery-Ronay Jr., 2008; Duggan, Lindley & McNichol, 2017; Vervoort, Bendor, Kelliher, Strik & Helfgott, 2015). In this study, world building encompasses the following story elements: *Plot/Novum*, the storyline that the text follows based on the novum, which is defined as the 'new thing' that serves as the primary differentiating factor between the future society envisioned and our own temporal present, and the ways in which it impacts their society;

Setting, which encompasses both where the story takes place and the temporal distance from the present; *Culture/Community*, or the sociological behaviours of the characters and broader society represented in the text; and *Affect*, or the general feeling student-authors want the reader to feel when they engage with the SF future they have created. I constructed these working categories based on texts about writing SF (Barr, 2003; Clareson, 1971, 1977; Delany, 2005; Gillett, 2001; Gunn, 2000; Le Guin, 2014; Rieder, 2017; Hopkinson in Rutledge, 1999; Shippey, 2016; Tuttle, 2005; Wolfe, 2016). I position the concept of world building as a form of narrative imagination guided by the extrapolative writing process, since SF authors often gain inspiration from the present in order to construct their visions of the future. Instead of focusing on what SF authors do when they construct science fictional futures as solely an analytical tool, I use this concept to further clarify the way that SF can meaningfully engage students in the turbulent present moment as they author the world building process themselves.

World Building

Collaborative world building, or collaborative storymaking (King, 2007), is a process where students work together to construct a story foundation (i.e. setting, general timelines, major events) collectively, acting as a frame within which individual contributions can occur. A significant example of work on world building in education is Trent Hergenrader's (2017) "Steampunk Rochester: An interdisciplinary, location-based, collaborative world building project." He describes his collaborative world building unit as having two phases,

> [...] the first is the writing of a metanarrative or an overarching story about the fictional world; the second is the creation of a catalog of wiki entries that describe the people, places, and things that populate this world. When writing the metanarrative, the students have to work out in detail how different aspects of the world operate and interrelate, including

> different aspects of governance, economics, social relations, and cultural values. When the group reaches a general consensus about the broad narrative that describes the world, each student then begins writing their own unique wiki entries for specific people, places, and things. (2017, pp. 135-136)

The above provides a general overview regarding the world building process. However, contrary to Hergenrader's emphasis on consensus as a part of his world building process, and given the focus on democratic practices and the rejection of shallow consensus present in this study, the student-lead planning sessions described in Chapter Six – in contrast with Hergenrader's approach – function as a site of negotiation, contestation, and challenges concerning students' visions of the future as they work through the framing details of the 'world' they built together, including temporal distance from the present, and major events that shape the future history envisioned. Further, unlike Hergenrader's approach, these details of the future students imagined were not necessarily locked in place as the narrative shifted and changed, and students continued to expand upon and work through future visions. This kind of collaborative world building provided space for discussion for participants to deliberate how people inhabit the world differently and explore how individual experiences impact particular understandings of reality and how worldviews are constructed (Hergenrader, 2017, pp. 136-137), as students worked through often irreconcilable visions of what the future might entail. This study also drew on Hergenrader's modeling of digital writing tools such as wikis and online mapping software to support participants' development of a multi-directional narrative and expands upon what constitutes creative writing and storytelling, in addition to facilitating broader student engagement in ways that traditional conceptions of writing alone might not.

The world building project itself is designed to be a collaborative exercise in non-linear narrative. It involved students having to determine key elements of their 'future' megahistory (Csicsery-Ronay Jr., 2008, p. 82): how far in the future would they stage the world building project? What significant events would have happened prior to the temporal moment in which their 'world' is set? What else needs to be decided before they can begin 'filling in' this world? Part of the reason that collaborative science fictional world building is incommensurable with a neat, consensus-driven model of collaborative storymaking is because, as Lisa Tuttle (2005) in *Writing Fantasy and Science Fiction* asserts, it involves thinking through the whole 'ecology' of the world – what one student might want to explore in their individual wiki entries and writing necessarily impacted other aspects of the 'world' that other students explored, requiring that they discuss how their future visions impact one another (p. 40). Because SF narratives require internal coherence in order to convincingly encourage readers to suspend their own disbelief, students puzzled through the problem of how competing future explorations could coexist within the project to subsequently build towards the complexity of developing a collaborative world rather than engaging in rivaling futures and/or flattening the uniqueness of their future explorations.

The process of negotiating worlds in response to these questions acted as what Gert Biesta (2012) calls 'staging' dissensus. Staging dissensus is a pedagogical intervention that introduces "an incommensurable element - an event, an experience and an object - that can act both as a test and as a reminder of publicness" (p. 693). Imagining the future is both a private and public experience. The world building project inhabited that liminal space between public and private as students worked through their thoughts and engaged in dialogue with each other over their decisions and contributions to the project. Importantly, as Vervoort, Bendor, Kelliher, Strik & Helfgott (2015) note,

> [...] the call to explore futures in a pluralistic fashion dovetails with the impetus to engage discomfort and knowledge gaps rather than pursue plausibility and probability. [...] contrasting societal perspectives may yield discomfort, while particular understandings of the world can offer unanticipated insights. Both of these principles may, in turn, feed truly imaginative engagements with the future. (pp. 63-64)

This process of world building, or what Vervoort et. al (2015) call world making, can "extend notions of agency" as students lend their voice to a collective, public process that does not collapse difference, but contains it as multiple presents and futures mix together.

The first stage of this research took the form of a participatory action research study. It mobilized ethnographic methods over three months in one high school English classroom, with the world building project happening in the latter half of the study. Observations and findings from the first stage project subsequently informed the second; the development of a world building assignment for pre-service teachers in an education course on new media literacies and culture to further explore the implications of this kind of work on pedagogical practice. In the first stage of the study, beyond the general structure of the project and SF genre convention work, the world building intervention was designed in collaboration with the participating teacher based on their interests, their knowledge of the students in the class, and my own observations and data. Data was collected through fieldnotes, a pre-study interview on the future, students' written responses to open questions about the future, an informal verbal survey about their genre familiarity and use, and teacher and student feedback during the beginning stages of the collaborative planning process. Two additional group interviews were also conducted before and after the world building project. In addition to engagement with a wide range of SF texts (short stories, novels, movies, video games), students also mobilized a combination of individual and collaborative writing in the

world building project in which they ultimately imagined the future of Toronto in 2049. This storytelling was supported by the use of digital writing tools such as wikis and digital mapping to move beyond isolated and singular approaches to the creative writing process.

Situating students' efforts within SF and speculative narrative structures, this project provided students with an opportunity to engage in dissensus and contestations that arose in the context of prospective change. In contrast with realist, present-set storytelling, adding the layer of futurity to the collaborative world building or storymaking process further complicated the "representations of people, places, and things - both in fictional and actual worlds students "inhabit" throughout the project (Hergenrader, 2017, p. 133). Foregrounding fictional futurity in students' storytelling efforts also assisted them in thinking about 'real' futures in increasingly complex ways. It moved them to consider the future beyond the utopia/dystopia binary that is prominent within popular representations of the genre, particularly seen in adaptations of young adult science fiction texts, superhero film franchises, the familiar utopia-gone-wrong trope (Paik, 2010; Luttrell, 2005). Given the nature of uncertainty in students' varied relationships with the future, the myriad ways in which individuals process uncertainty and future potentiality based on their own experiences and subjectivities, and the structure of wikis as a platform that accommodates endless expansion, this process also necessarily remained incomplete as students worked through and continually returned to their ideas. The fact that this project remained incomplete as students engaged with their developing thoughts on the future, instead of imposing expectations that they develop a 'complete' story with a clear ending, was an important idea to contend with. The findings around uncertainty, irreducibility and uniqueness are particularly salient in an educational era where narratives of mastery over the future are prevalent in response to societal concerns regarding unknowability and unpredictability in contemporary contexts.

Statement of the Problem

The primary problem underlying this study is the inadequate way that the future is engaged by contemporary education. Common approaches are too often mastery-oriented and force imposed narratives of complete control over their own futures on students, thus poorly equipping them to face inevitable future uncertainty. This imposed narrative of control over the future is also set in stark contrast with how many young people *actually* feel, with words like 'hopeless,' 'helpless,' and 'worried' or 'scared' peppering students' comments regarding future possibility. Problematically, in spite of the fact that the speed of change exacerbated by technological innovation (Kurzweil, 2005; Csicsery-Ronay Jr., 2008; Sullivan, 1999; Thomas, 2013) and the neoliberal project of globalization (Bauman, 2007; Todd, 2009), resulting in the shifting social and individual experience of time in contemporary society (Sharma, 2014; Wajcman, 2015), the future is seldom taught directly in schools except through narratives of control. As Anita Rubin's (2013) research on the overwhelming impact of negative future images on teachers and students reveals, there is a desperate need for work that purposefully engages educational communities in dynamic, multiple, pluralistic conceptions of the future that can help students and teachers process potential disaster, imagine alternatives, envision potential actualization of preferred futures, and live meaningfully with the uncertainty and unknowability of a future that exists transiently and always just out of view. This study therefore explores ways to help students live with inevitable uncertainty, instead of feeding a desire to control future outcomes.

Ontario Contexts

The Ontario Curriculum for English (2007) exemplifies the control-oriented treatment of the future in curricular planning that I problematize in this work. Specifically, instead of acknowledging elements of unknowability that are present in our relationship with the future, the

curriculum emphasizes 21st-century skills and implicitly promotes capacities to solve the problem/s of the future through a rational, positivist conception of critical literacy and critical thinking, geared particularly towards anticipated future job markets (Ontario Ministry of Education, 2007, p. 110). While 21st-century skills are an important part of contemporary education, too often they are mobilized to make sure students are competitive in a global market (Geist, 2016; Kay, 2009; Kivunja, 2014, 2015). Critical thinking is framed as an apolitical exercise in rationality aimed at preparing students to solve future problems (Barnet & Bedau, 2014; Baron & Sternberg, 1987; Lau, 2011; Moore & Parker, 2012) as if the future is somehow conquerable from the present. Problematically, 'critical literacy' and 'critical thinking' are the terms used in the curriculum to encompass concepts such as world citizenship, anti-discrimination education, deeper understandings of the world more broadly, and students' ability to be active citizens. These ideas, under the umbrella of rational criticality, become overrationalized and therefore made complicit in the attempt to prepare defensively for uncertain futures, anticipatorily problem solve potential conflict and discomfort, and view the most pressing problems facing society apolitically. This approach sanitizes and treats pragmatically the opportunity that literature presents to help students democratically and politically answer various calls to action and conceptualize their responsibility to myriad potential and preferred futures in complex ways. The extension of this study for pre-service teachers was similarly designed in response to the approaches problematized above, and allowed participants a chance to explore pedagogies that move beyond such narratives of mastery in their practice.

Problematizing the Desire for Control

Contrasting the desire to eliminate uncertainty and exert control over the future, in this study I echo the argument that Sardar and Sweeney (2016) make that "[...] our command-and-

control impulse will only serve to heighten our ignorance and entrench uncertainty," and our effort should not be to "manage risk but rather our perceptions of risk" (Sardar & Sweeney, 2016, p. 10). The unique contemporary conditions in which we live require a balance of dispositions, where we must learn to rest in uncertainty without becoming paralyzed by the weight of the unknowability of the future, and accordingly act in ways that *could* contribute to myriad preferred futures without the need for guaranteed predictability of favourable outcomes. While some researchers have used SF as a predictive tool to increase a sense of control over the future (Johnson, 2011; Birtchnell & Urry, 2013; Bina, Mateus, Pereira & Caffa, 2016; Milojević & Inayatullah, 2015), in this research I explore how SF can be used to reduce the paralysis that comes from hopelessness, and lead to an increased sense of agency in students, without foreclosing on the radical potential of the future by quantifying or attempting to control it. The following questions therefore framed my inquiry:

(a) What are students' thoughts on the future, including their hopes, fears, and approaches to planning for the future, and how is the future explored in classrooms?

(b) How does student disposition towards the future affect their sense of agency and active engagement with issues in the present?

(c) How can science fictional world building facilitate students' engagement in democratic, collaborative decision making about the future, without foreclosing on the concept of uncertainty, and a plurality of perspectives and possibilities?

Through these lines of inquiry, I explore potential avenues for empowering students to engage actively in working towards *preferred* futures, without falling victim to a sense of hopelessness and inability to act due to the inherent unknowability of the future.

While informed directly by work with students on the world building project in the first stage of the study and therefore framed in part by the same research questions, the second stage of

the study working with pre-service teachers facilitated an opportunity to explore some additional questions, including the following:

(a) How do post-secondary education students' and teacher candidates' interactions with science fiction and science fictional world building influence their pedagogical beliefs and thoughts on education?

(b) How does exposure to science fiction and purposeful envisioning of the future inspire a rethinking of possible pedagogies, educational structures, and teaching methods?

(c) In what way does exposure to pedagogies that teach towards future uncertainty influence students' own dispositions towards uncertainty in their teaching practice?

Further, world building in the context of pre-service teacher education facilitated teacher candidates' exploration of alternatives to dominant forms of educational practice today, as they imagined possibilities for how education in the future could look 'otherwise.'

Chapter Summary

This dissertation is divided into eight chapters. In chapter two I explore theoretical perspectives that underpin the approach I take to world building within this research through tracing the affordances of a poststructural and democratizing approach to science fictional, collaborative world building. In this chapter, I also describe how critical theory is used to frame students' speculative storywork as disruptive, particularly in the context of future-oriented pedagogical research. In the literature review (chapter three), I articulate definitional challenges associated with SF and approaches to the genre that inform the approach I take in this study. This chapter also includes an overview of research about using SF in education and establishes the gaps in this area on the use of SF in both K-12 contexts and as a catalyst for pedagogical development and change. Finally, this chapter explores how the future has been addressed in schools and

describes research at the intersection of education and futurity. Chapter four describes methodological and analytical approaches I took to the two-part study that this dissertation reports on, including the participatory action research study I conducted with a secondary English class and how I integrated ethnographic methods as part of this inquiry (stage one), as well as the smaller second stage of this research working with pre-service teachers. The following three finding-reporting chapters present data with integrated discussion throughout, beginning with chapter five in which I detail secondary students' experiences with SF, interwoven with their own hopes and fears about the future. In chapter six, I explore the collaborative world building project *Toronto 2049* that students undertook in the latter part of the study. Building off of the first stage of this research, chapter seven details world building work that I did with pre-service teachers exploring educational future possibility, which furthers the concept of speculative pedagogies introduced in chapter six. In the last chapter, chapter eight, I expand on this concept by way of conclusion, and address study limitations and recommendations for future research in this area, particularly in the context of the shifting dynamics in which we find ourselves.

Chapter Two: Theoretical Perspectives: A Poststructural and Democratizing Approach to World Building

In this chapter, I position my research within a certain orientation towards science fiction (SF), viewing the genre as a narrative catalyst for navigating difference and change. The integration of collaborative, speculative storytelling, through the world building project in the first stage of this research specifically further reinforces the pedagogical affordances of SF as a means through which plural futures can be imagined and negotiated. Accordingly, this study was conducted in dialogue with aspects of radical democracy and poststructuralism, further emphasizing the presence of difference in science fictional future construction and making space for multiple—and sometimes conflicting—futures to co-exist within the same collaborative work. The collaborative world building project this dissertation discusses (chapter six) is a manifestation of what Barbara Thayer-Bacon (2001) describes as "a relational ontological perspective that views individuals as socio-historical beings who daily co-construct their lives with others" (p. 15). As such it rejects totalizing notions of knowledge, as well as singular, predictive visions of the future. World building is also conceptualized in this study as an opportunity to reinvigorate publicness in education through communities of contestation and disruption. The future here is seen as a shared, public concern, and the potential of youth to engage with the concept of the future - in ways that highlight instead of eliminate difference to bring forth the potential of previously unimagined possibility - is illuminated in this research. The existence of multiple perspectives and 'truths' advocated for in poststructural thought in addition to work on radical democracy is therefore a key part of this study, as radical democracies-in-the-making, particularly in educational spaces, are open to a multiplicity of views which are positioned so as to continually disrupt one another and overarching claims of a 'true' future that can be known.

Democratic Pedagogies

This study was conducted through the theoretical perspective of democratic education, specifically radical democracy as advocated for by Chantal Mouffe (1993) and Jacques Rancière (1998; 2007) in contrast to aspects of liberal democracy. In particular, through this study I sought to explore democratizing storytelling beyond processes of consensus as described below. I move towards envisioning a collective world building project that creates space for agonistic dialogue and invites students to contribute beyond the entry conditions of democratic dialogue typically employed in schools (i.e. proficient academic performance, consistent attendance, academic and school-appropriate language use). Sharon Todd (2009) in *Toward an Imperfect Education: Facing Humanity, Rethinking Cosmopolitanism* defines liberal democracy as a dialogic, consensus-driven model which, in classrooms, at best results in shallow forms of political engagement, and at worst involves students having no outlet through which to explore their political views and, as a result, causes them to lash out violently against those who are different from them. In fact, Todd maintains that democracy "requires opposition, dissent, and disagreement for its survival," and must involve political, agonistic dialogue which does not succumb to shallow consensus in order to be meaningful (Todd, 2009, p. 100). For Todd, and similarly for this study, the promise of democracy lies in giving students an opportunity to explore the world on their own terms and engage meaningfully with others, even when those engagements are characterized by disagreement and messiness. In this sense, "[…] educating for a democratic project, one that seeks to live meaningfully with pluralism, is to embrace the imperfection of democracy itself" (Todd, 2009, p. 115). This study was motivated by the prospect that if students are given an opportunity to articulate their visions for the future as active agents who are capable of bringing about such change, they will be that much more committed to the prospect of acting towards those envisioned

futures in the present, even if their realization is not guaranteed. Importantly, as signaled by the inevitably 'unfinished' nature of the world building work described in chapter six, this work as an act of imperfect democracy also requires an openness to the messiness of plurality.

Approaching education as something open to possibility and without a concretely defined objective serves as an anomaly in an age defined by assessment and standardization. Writing in the early moments of our current educational model, the approach I take in this study follows that of John Dewey (1916: 2001). With Dewey, I acknowledge the intellectual limits of an educational approach which adapts to external goals, such as a deeply entrenched emphasis on job attainment and financial success. Contrary to public dialogue on education, Dewey problematizes the fact that student learning is largely treated as the means towards capitalistic, individual ends, instead of viewing learning as a public good and as an equalizing force in arguably unjust societies. Maxine Greene (1988) similarly opens *The Dialectic of Freedom* by describing this issue both in and beyond educational contexts: "Talk of the free world today is intertwined with talk of economic competitiveness, technology, and power. Talk of personal freedom refers to self-dependence and self-determination; it has little to do with connectedness or being together in community" (Greene, 1988, p. 1). Greene argues that this fixation on economically-driven progress and the lonely, thoughtless, individualistic, and widespread turn away from *community* has left youth and adults alike feeling "rootless," without the ability to "shape authentic expressions of hopes and ideals" as they lose sight of what freedom means in relation to public life (Greene, 1988, p. 3). These issues raised by Dewey, and later by Greene, are therefore taken up in this study through adopting a community-oriented approach, wherein students' collaborative learning as a dynamic and unpredictable event imbued with publicness is given space beyond isolated and individualized, quantifiable products and outcomes of learning.

Learning in community

Learning in contemporary contexts is increasingly focused on individual students' acquisition of skills which help 'prepare' them for the future, most significantly to prepare students to be individually competitive in global job markets. However, this model does not help students form complex understandings of the world around them and move beyond production-driven markers of success. Jacques Rańciere (2007) similarly problematizes this inability to form and articulate authentic opinions, hopes, and perspectives, noting that:

> Depoliticizing conflicts in order to settle them, or stripping otherness of any yardstick the better to solve its problems - this is the madness which our time identifies with a reasonable and easy democracy that harmonizes state initiatives with the natural tendencies of productive society, with its efforts and desires. (pp. 105-106)

What scholars who embrace a messier, ever-transient view of democracy suggest, then, is that to move away from pragmatic conceptions of education, there is a need to allow the political to enter the classroom without eliminating its ability to disrupt. The idea of disruption here is central, especially given that education is inherently political but, importantly, only certain political subjectivities are generally allowed (i.e., those that serve to reinforce pre-existing power structures) in formal learning spaces. Further, schools seldom make space for *students* to inhabit disruptive political positions, even though students are already political and politicized by virtue of existing in relation to others within society in general, and in their school/local communities in particular. For example, this was especially the case for students in the first stage of this study who, by attending an alternative school that serves students who have left the mainstream school system, were already engaged in a kind of politics of disruption and were therefore navigating what it meant to leave and re-enter a political system of power (the education system).

Subsequently, both the *Toronto 2049* world building project (chapter six) and the world building tasks pre-service teachers engaged in (chapter seven) made space for students and pre-service teachers to directly navigate political disruption rooted in collaboration and difficult listening practices as they engaged with each other's ideas, perspectives, and experiences.

This need for political disruption manifests in many texts as a need for community within the political, where "[...] the political becomes an articulation of differences - and the conflicts that inevitably arise from these differences - in local contexts" (Todd, 2011, p. 108). This approach to the political within the classroom opens up space for a kind of democracy that is "neither compromise between interests nor the formation of a common will. It's kind of dialogue is that of a divided community" (Ranciere, 2007, p. 103). In a project about teaching towards the future through a radically democratic conception of classroom engagement, I view the future itself as of shared, public concern and as a site of contestation in which a plurality of positions can be heard. In the collaborative, speculative, and future-oriented world building work described in this dissertation, the uncertainty that arises from a cataclysmic fusing of plural visions of possibility into a collective, messy future is an integral part of a democratic pedagogy.

As Hannah Arendt (1958) in "The Public and the Private Realm" suggests, diversity is a necessary condition of both democracy and notions of the public where transformation can meaningfully occur. In approaching this project in-community without the expectation that students will eliminate tensions that arise in disagreement, Arendt's concept of natality can emerge. As Natasha Levinson (1997) notes regarding the importance of natality, or the disruption caused by the new interrupting the pre-existing world, possibility for the new to emerge and replace the old is crucial in "an overdetermined world" where individuals are left feeling powerless to change the trajectory of society (p. 439). By advocating for a pedagogical approach that does not

limit the scope of difference, but instead opens up possibility for students to see how things could be otherwise (Greene, 1982), and engaging in this process through community-oriented, imaginative praxis (Greene, 1995), this study explores the possibility of plural, messier conceptions of the future in the classroom. While students were given the 'tools' of SF necessary to meaningfully engage in the world building project, the task of envisioning the future embodied the pluralistic views of the students in the classroom, each with their own unique ways of seeing the world. Arguably, the messiness of democracy and the disruptive element of equality within the learning experience through students' views and visions is a key part of any project that seeks to open up, instead of limit, imagined possibility.

Poststructuralism

Broadly defined, poststructuralism is a set of theories that emerged in critical response to structuralism, a systematic movement of thought which sought to categorize and make overarching and fixed truth claims about dynamic flows of society and culture, leaving little room for variation and difference (Belsey, 2002). For poststructural theorists, there is no concrete 'origin' of meaning, and traditional accounts of truth must be questioned, put into historical context, and understood as one way of seeing among many (Peters & Burbules, 2004, p. 4). The concept of knowledge itself as pure and impartial is also called into question, an argument taken up by Michel Foucault (1981) who asserts that knowledge and power are inextricably linked, and that knowledge, through truth claims and discourse, exerts a kind of violence against both others and alternative ways of knowing. The interconnected nature of knowledge and power is particularly important in this project - following Foucault's argument, to 'know' the future is to exert violence upon its potential and exclude future alternative ways of being. Through Foucault, poststructuralism helps establish

the importance of navigating unknowability instead of attempting to 'master' the future through predictive measures in this study.

Poststructuralism and Science Fiction

Csicsery-Ronay Jr.'s (2008) consideration of the increasingly blurred line between the binary of present/future further characterizes my thoughts on poststructuralism within the context of SF as a genre of difference:

> Because the future does not exist to be concretely described, it is arguably only an empty elsewhere in story space, using futuristic details as poetic devices for exoticizing the present. Writers occasionally defend the genre's honor with the claim that it is not truly *about* the future at all. [...] At the same time, the sense of the present in this present/future dichotomy is saturated with future-orientation: anticipations, anxieties, hopes, promises, and plans, in individual minds and in the audience's collective consciousness. (pp. 78-79)

Science fiction viewed in this way is necessarily poststructuralist, as it embodies present and future simultaneously, but always incompletely and always in the plural. This echoes what Jean-François Lyotard (1979), another significant figure in poststructuralist thought, notes in *The Postmodern Condition*; the 'postmodern era' can be identified by a loss of grand narratives of progress, and it is imperative that dissensus, or counter-narratives, be mobilized against systems of continually maximized performance in order to maintain multiplicity in an era of totalizing structures of knowledge. In this study, then, through the breaking down of binaries such as present/future and the dismantling of grand narratives of progress which only identify singular futures, both secondary students and pre-service teachers produced counter-narratives of the future that opened up possibility, instead of engaging in the violence of knowledge against the future.

Critical theory

In the context of the colonial history of ethnography and ethnographic methods, as will be further discussed in Chapter 4, Paul Atkinson and Martyn Hammersley (2007) note the presence of critical theory in many "post-anthropological ethnographies," in part because of critical theory's link to poststructuralist ways of thinking about truth that address methodological violences in ethnography's past (p. 17). By drawing from a range of critical theory approaches and 'reading' ethnographic data as manifestations of classed, gendered, racialized, and myriad other forms of engagement infused with power dynamics and imbalances, singular overarching truth claims become increasingly more difficult to assert within the context of research that employs ethnographic methods. Critical theory has a distinct historical beginning in the Frankfurt school under the leadership of Max Horkheimer, and later Jürgen Habermas, with an emphasis on the critique of bourgeoisie society and normative social structures, critical perspectives on Marxist thought, and the impact of cultural production in everyday life (Dant, 2004; Geuss, 1981; How, 2003; Marshall, 2001; Rush, 2004). However, in this study I draw from critical theory as an "understanding of diverse forms of oppression including class, race, gender, sexual, cultural, religious, colonial and ability-related concerns," characterized by a perpetual search "for new and interconnected ways of understanding power and oppression and the ways they shape everyday life and human experience" (Kincheloe in McLaren & Kincheloe, 2007, pp. 18-19). Concepts underpinning critical theory such as power, privilege, ideological and repressive state apparatuses, ideology, hegemony, and technological and cultural production and change, as well as the dominant discourses and metanarratives which underlie how power operates within society, were subsequently used to frame my understanding of students' collaborative world building project as it developed, and allowed me to interpret the significance of students' thoughts on the future in

multiple ways. Further, borrowing these concepts when working with students to explore what constitutes a 'society' during the world building process, and subsequently navigating questions about positionality and who might view certain forms of societal change *as* utopian, allowed students to critically navigate the future they collectively imagined together.

Critical Theory and Science Fiction

My approach to critical theory as a contributing theoretical perspective in this study also comes from Carl Freedman's (2000) *Critical Theory and Science Fiction*, in which he equates critical theory *with* science fiction. He defines critical theory in the following way:

> Critical theory, to use a currently fashionable term, is unswervingly oppositional. […] Critical theory is dialectical thought: that is, thought which (in principle) can take nothing less than the totality of the human world or social field for its object. […] critical theory constantly shows that things are not what they seem to be and that things need not eternally be as they are. Thus it maintains a cutting edge of social subversion even at its most rarefied and abstract. (p. 8)

For Freedman, critical theory draws further attention to the constructed nature of reality and truth, something which SF can also accomplish through the range of futures that are imagined in the science fictional megatext, a term used to encompass the range of fictional futures, tropes, and themes existing within the genre that build upon each other and inspire further science fictional, future-oriented narrative explorations (Csicsery-Ronay Jr., 2008; Luttrell, 2005). This questioning of structures and systems of power in any given society and the dismantling of an oppressive concept of 'truth,' through identifying how things could be otherwise, is significant in any project which seeks to engage meaningfully with a concept of the future that does not merely extend the conditions of the present. Embedding critical theory approaches to future-oriented pedagogies in

a study such as this not only impacted my own methodological practice, but also facilitated students' resistance against accepting things the way they are, and envisioning alternatives beyond binaries of dystopian/utopian future imaginary; an important part of students' narrative explorations as they sought to envision increasingly complex futures inhabiting the liminal space between subgenres. Significantly, Alan How (2003) argues that critical theory "hangs on to the possibility that things could be different" (p. 173). The connection to critical theory in this project, then, involves an exploration of temporality in its full scope, as past, present, and future push against each other in the classroom, thereby facilitating the creation of previously unimagined visions of difference.

Conclusion

Positioning radical democracy and poststructural thought as theoretical frameworks, I explore the pedagogical potential of messy, chaotic engagement with the future in classrooms. Poststructural and critical theories frame the collaborative world building project in the first stage of this research, and the widely varied narratives of pedagogical futures envisioned by pre-service teachers in the second. I engage these theories as opportunities to engage in uncertainty without advocating for students to attempt to eliminate unknowability. Speculative narrative imagining in this work opens up possibility for authentic engagement with difference in the classroom, and endorses a view of knowledge as something collectively constructed in myriad forms. Students' visions of the future inevitably clashed, and it is in these moments of dissensus that the critical potential of difference resides. In the teacher candidate iteration of the world building project, pre-service teachers similarly engaged with uncertainty, and worked through the discomfort of unknowability in their own practice. In the next chapter I will first expand upon how SF is

mobilized in this research and subsequently provide an overview of literature that exists at the intersection of SF, education, and futurity pertinent to this work.

Chapter Three: Literature Review - Science Fiction, Education, and Futurity

In the following literature review I contextualize the contribution this study makes through consideration of pre-existing work in the following areas: science fiction (SF), and orientations towards the genre that inform my approach; a focus on the work done using SF in education, particularly in the context of future-oriented education or lack thereof; and scholarship specifically about education and futurity, and how teaching towards the future has been approached directly in educational research. In this chapter, emphasis is placed on discussing how this study builds upon previous contributions in each respective field. I place particular attention on possible openings where the future can be conceptualized in increasingly varied ways that celebrate both the inclusion of myriad perspectives and resulting tensions as the future is worked towards in the present. For the SF section, I make the case for why SF is being used in this study and what SF uniquely offers as a pedagogical genre. I then focus on work about the future and temporality in the context of SF, explore takes on defining the genre that contribute to this area, and discuss work on the opportunities that open up as a result of different temporal approaches to the genre. In the SF and education section, I consider existing gaps in research about teaching towards the future through SF, in addition to identifying the dearth of research that continues to exist in SF pedagogies. Importantly, this also includes virtually non-exist mobilization of SF in teacher education, which is particularly important in the context of stage two of this research (chapter seven). Finally, I consider the predictive, problem-solving approach that most educational texts about the future take either implicitly or explicitly, and contrasting dynamic work being done in this area that makes space for uncertainty and exploration of future imaginings.

Definitional Challenges in Science Fiction

Gary K. Wolfe begins *How Great Science Fiction Works* by observing that "[…] science fiction can be not only great literature but a significant and important body of speculative thought on issues that are crucial to our society and that are direct expressions of our hopes, fears, and dreams" (Wolfe, 2016, p. 2). While this view is largely shared within SF scholarship, views on *how* SF functions through its definitional parameters are widely varied. As John Rieder (2017) observes in *Science Fiction and the Mass Cultural Genre System,* almost all texts on SF begin with a lengthy exploration of defining the genre. Many authors then move on to determining a text of origin, be it Mary Shelley's *Frankenstein,* Hugo Gernsback's pulp magazine *Amazing Stories,* or even Jonathan Swift's *Gulliver's Travels* (Luckhurst, 2005). The definition of the genre and the determination of a 'beginning' of SF are usually connected, but there are continually expanding combinations in this regard. As Carl Freedman (2000) asserts in *Critical Theory and Science Fiction*, "No definitional consensus exists" (p. 13). Rieder argues that this "web of sometimes inconsistent and competing assertions" partially constitutes the identity of SF as a genre (2017, p. 15), and as such he ultimately dismisses the lengthy process of definition so common in SF scholarship in its entirety. Instead, for Rieder, a definition and experience of SF occurs *in community*, and is defined through the infinite uses the genre is put towards: escape, critique, a sense of wonder, or an intergalactic future to immerse oneself in and dress up in the spirit of. While there are elements of SF that seem common across definitions, texts, and sensibilities - the 'future' as the setting of most SF texts, an emphasis on the impact of myriad forms of innovation on society and an emphasis on difference between the reader's present and the world envisioned in SF narratives - what is important to note here is that, in many ways, the genre is socially constructed

by those who put the genre to highly varied uses. This positions SF as a genre which can facilitate increasingly open, multiple possibilities for engagement.

My approach to SF is therefore less about deciding which texts are science fictional and which are not, but rather about how students attribute the label of SF to certain kinds of texts and ways of thinking, and for what purpose they choose to do so in the context of future imaginings as they think alongside SF texts. The importance of giving students space to explore SF as an open genre, with definitional parameters that can be negotiated by students as part of the thinking and learning process, is echoed by Gary Westfahl (2011) in "Theorizing Science Fiction: The Question of Terminology," where he suggests that the definitional ambiguity of the genre be used as a starting point for the teaching of SF as a genre:

> Beginning such a class by surveying the students' various notions of what they think it is that they will be reading can be a useful and often enlightening exercise, both by way of introducing a discussion of problems of definition and as preparation for the students' later encounters, in their own research, with the sometimes idiosyncratic critical vocabulary that has evolved in science fiction scholarship. (p. 39)

While a universal definition of SF is continually sought after, it is this openness to interpretation which contributes in part to the critical potential that SF has as a genre to be taught. In this sense, even though I brought my own beliefs about SF into this study, the genre boundaries that I imposed on SF were necessarily pushed and expanded by students as they grappled with their own future narrative(s). Students' engagement with definitional problems surrounding SF in this study, such as the inclusion of elements of fantasy within future-set narratives for example, further echo changes within the field of SF as more speculative genre orientations bleed into the definitional boundaries of SF as a genre of and about *science*. These reconceptualizations of SF move beyond

predominantly white and western epistemologies privileging empirical rationality above all else, and gain traction through Indigenous futurisms (Dillon, 2012) and afrofuturism (Lavender III, 2019), making the approach that Westfahl describes above an integral part of exploring SF pedagogically as an open question as opposed to a strict genre.

Science fiction and temporality

Although the definitional flexibility of SF is both acknowledged and celebrated within this study, a more structured approach than Rieder's perspective that informs my use of SF is Farah Mendelsohn's (2009) in *The Intergalactic Playground,* with SF consisting of four key elements*:*

> DISSONANCE, RUPTURE, RESOLUTION, CONSEQUENCE. [sic] […] What I have termed DISSONANCE [sic] is constructed by the novum and the element of cognitive estrangement. The novum is the idea or object that creates the rupture within the world as we understand it. (p. 10)

For Mendelsohn, dissonance is an essential part of any SF narrative - a kind of disruption that interrupts readers' experiences with the text and pulls them into a comparative liminal space between present and future where they must try and reconcile the differences that they are faced with. Mendelsohn makes the claim that it is the novum, or the main 'new thing,' that is the primary catalyst of difference within the text that causes this kind of interruption. Put another way, SF, through the novum, tackles what is taken for granted in the reader's present and subverts it, so that the status quo is "estranged and historicized as the concrete past of potential futures" and can then be interrogated at a distance by the reader (Freedman, 2000, p. 55). Although not a necessary condition, I also argue that the temporal position of the future is fertile ground for this kind of disruption, and one which most SF texts utilize.

However, perhaps the presence of difference - interpersonal, social, scientific, temporal - is a more dynamic and open way of approaching an 'essence' of SF as a genre than the specific condition of temporality alone. It is the way the complicated relationship between the present and future is utilized in SF that allows the genre to act as a site for articulating difference. Joseph W. Campbell (2019) in *The Order and the Other: Young Adult Dystopian Literature and Science Fiction* argues convincingly that it is in fact this capacity for articulating and representing difference that sets SF apart from its dystopian sub-genre counterpart, and from realist fiction in general. Building on the importance of 'difference' and its mobilization within SF, this line of thinking makes Csicsery-Ronay Jr.'s (2008) concept of science fictionality pedagogically useful. He argues that, with the "strikingly high proportion of films, commercial art, popular music, video and computer games, and nongenre fiction [that] are overtly sf or contain elements of it" and the speed of change in contemporary society, science fictionality can be perceived as an increasingly prevalent habit of mind (p. 2). The genre's popularity suggests that not only is SF a genre through which difference can be explored but that it characterizes a dominant state of mind in contemporary social consciousness. This conceptual move towards science fictional and speculative thought as not simply a literary construct, but as a way of conceptualizing and understanding broad experiences beyond fiction, is seen across the field of SF studies writ large: from andré m. carrington's (2016) work on speculative blackness wherein speculation is a discursive mode through which race can be thought and thought anew, to Sherryl Vint's (2010) *Animal Alterity: Science Fiction and the Question of the Animal* in which she mobilizes speculative thought towards ethical relationality within the human/animal binary and its present and future implications, to Aimee Bahng's (2018) *Migrant Futures: Decolonizing Speculation in Financial Times*, in which she argues that capitalism and colonialism *are* speculative fictions. SF and speculative thought

are consistently being taken up beyond literary studies as a way of seeing and critically engaging with the world.

C.W. Sullivan III (1999) also echoes this view in *Young Adult Science Fiction,* and further emphasizes the potential that SF has to change the way we think about contemporary experience, stating the genre's ability "lies in the extrapolative nature of the genre itself," claiming that no genre is "so free to imagine the possibilities of other worlds, societies, and times as science fiction" (Sullivan III, p. 1). In an era marked by ongoing change, SF's concurrent spike in popularity suggests it is a genre which helps readers and viewers process an ever-shifting present moment. The connection between SF futures and the present is also seen throughout SF scholarship, as P.L. Thomas (2013) in *Science Fiction and Speculative Fiction: Challenging Genres* similarly notes:

> A central quality of SF and speculative fiction (fantasy and historical fiction as well) that is significant is that the creation of some form of another world helps frame for the readers this world. Whether the other world is conjured by a shift in time or reality, the other world becomes both a commentary on this world and a possibility of other ways of being (again, a powerful and critical element in SF). (p. 193)

The potential of the present therefore exists within the fictional futures portrayed in every SF text, and it is exactly this temporal link that makes SF a useful genre to facilitate students' explorations of potential futures, as they use SF texts to imagine the positive and negative consequences of present action, the myriad possibilities that might result, and uncover opportunities to disrupt the present moment.

Science fiction and futurity

As noted above, an emphasis on the treatment of time in SF is a significant reason why the genre plays such a key role in this work. As such, I position SF here as a vehicle through which

increasingly diverse possible futures can be explored from the vantage point of the present. Ziauddin Sardar and John A. Sweeney (2016) in "The Three Tomorrows of Postnormal Times" echo the view that previous efforts to 'contain' or 'predict' the future are no longer effective in what they call post-normal times, calling for the boundaries of plausibility, or what we believe could reasonably happen in the future, to be pushed, and advocating for "a new kind of thinking coupled with creativity and imagination," which requires that "we must be able to deal with complexity and incomplete knowledge, link what is compartmentalized, and tackle interconnections and interdependence" in order to adapt to our new position in relation to the future (p. 12). SF is a narrative space where the kind of thinking that Sardar and Sweeney advocate for can occur, with fictional futures acting as an opportunity for imaginative play in temporal possibility (Csicsery-Ronay Jr., 2008) where hopes and fears surrounding the future can be explored and negotiated. The importance of fictional futures as a catalyst for this kind of imaginative exploration is reinforced by scholars like Matthew J. Wolf-Meyer (2019) in his *Theory for the World to Come: Speculative Fiction and Apocalyptic Anthropology* and María Puig de la Bellacasa (2017) through her *Matters of Care: Speculative Ethics in More Than Human Worlds,* who each mobilize science fictional narratives and speculative thinking to articulate expansive, uncertain future possibility in fields beyond literary studies.

Donna Haraway (2016) also positions SF and speculation as an important narrative pathway towards open, uncertain imagining, making a similar claim in her *Staying with the Trouble: Making Kin in the Chthulucene* which begins with Haraway rejecting attempts to control the future:

> [...] in urgent times, many of us are tempted to address trouble in terms of making an imagined future safe, of stopping something from happening that looms in the future, of

> clearing away the present and the past in order to make futures for coming generations. Staying with the trouble does not require such a relationship to times called the future. (p. 1)

For Haraway, the acronym 'SF' takes on a broader use, standing in for "science fiction, speculative fabulation, string figures, speculative feminism, so far" (2016, p. 2). Building off this definitional approach which decentres common orientations to science fiction as predominantly *about* the future, Haraway argues that 'SF' should not be characterized exclusively by a fixation on the future but, rather, act as a means of reinvigorating action within the present. In Haraway's view, envisioning future possibility can combat present despair in the face of issues such as climate change and the destructive forces of capitalism, but this kind of exploration must be balanced lest readers fall into the trap of escapism through future imaginings, and thereby neglect to act within the present towards such futures (2016, p. 4). Problematizing the commonly held notion that technological invention will solve the problems of the world if one simply waits, Haraway cautions that speculating about the future through SF is significant to work through feelings of inadequacy and a perceived inability to enact present change, but one also runs the risk of seeing themselves as absolved from the obligation to act in the now when the present is abandoned entirely. As Haraway's warnings signal, SF is often generally defined by common themes and tropes which explore the impact of hypothetical technological and scientific advances on future societies, with inspiration taken from the authors' present contexts. SF texts can also explore social change such as a shift in systems of governance and politics. For example, Mendelsohn (2009) explores what makes a text 'science fiction' in detail, which informs the working vision of SF I use in this project:

> "[…] in the "full sf story," the resolution is not the end of the story, it is the beginning, for sf resolutions are about change and consequence. […] Identification of novum and

> cognitive dissonance usually leads to the idea of causality and consequence; that "what if?" needs to be followed by the concept of "if, then." (pp. 12-13)

SF is a powerful genre precisely because of the way it structurally encourages comparisons between the future and the present, and illustrates the consequences of potential future actions. This temporally comparative process is exemplified most notably in work that envisions SF *as political critique*, such as Adam Stock's (2019) *Modern Dystopian Fiction and Political Thought: Narratives of World Politics*, in which he analyzes modern dystopian fiction as intrinsically linked to contemporary political contexts, illustrating the fears, hopes, and political aspirations of its authors. This process is what acts as the site of ongoing negotiation and contestation within this study in both the collaborative storywork of secondary students and pre-service teachers' individual visions of educational change, as they worked to reconcile their inevitably irreconcilable visions of the future complicated by their experiences in the present and their own understanding of contemporary political and social life. But, echoing Haraway, the focus on the future in this work does not seek to abandon the present but, rather, form new connections for students between their past, present, and future(s).

Many literary genres elicit comparisons between the reader, and the characters and circumstances represented within the text and, indeed, the argument has been made that this is a crucial function of narrative over other forms of communication (Nussbaum, 2008). Departing from this, SF uniquely operates on a temporal level in addition to plot, setting, and character that uniquely positions the genre as a site of negotiation over visions of the future. In his text exploring the relationship between SF and ethics *Future Present: Ethics and/as Science Fiction,* Michael Pinsky (2003) describes the complex temporal plain on which SF operates as always capturing a complex interplay between past, present, and future, where linear conceptions of time can be

disrupted by possibility of something 'other' in what he calls the "spectral future" (p. 186). Elaborating on this envisioned potential of alterity, of *something other* offered in an ethical reading of SF, he likens this possibility-in-reading as a gift, but one that "is much like a conspiracy or a specter, operating on the border of perceptibility and always receding from the touch. *The gift is the very possibility of a future that can be anticipated, but will always contain the unexpected*" (Pinsky, 2003, p. 189). Similarly, and contrary to more prediction-oriented readings of SF as a genre, Csicsery-Ronay Jr. asserts that SF's completed futures do not "close down the horizon of the future by depicting it. The future is not a wave front that can be collapsed simply by imagining it. [...] there's always another future waiting to exist after each imaginary cataclysm" (2008, pp. 77-78). Drawing from the above approaches to SF and through engaging with students in a project of continually rearticulated collaborative world building, in this study I explore the pedagogical possibility of the genre to explore, and explore again continually, the gift of unexpected and unknowable futures.

Exploring radical alterity

SF can also be defined in part by its conflicting histories in relation to issues of representation and marginalization. On the one hand, SF is a genre that has been dominated by white, straight, largely middle-class male writers (Lavender III, 2011; Luckhurst, 2005; James, 1994), with an emphasis on western contributions to the genre still pervasive within scholarship on SF (Csicsery-Ronay Jr., 2008). If Hugo Gernsback's *Amazing Stories* (the first American SF pulp magazine, started in 1926) is taken as the 'beginning' of SF this especially seems to be the case, with the pulp magazines and texts from the 'Golden Age of SF' (1938-1960) (James, 1994) establishing a foundation for the genre as one predominantly written towards an adolescent male audience, as is made clear by the number of texts that contain male protagonists who leave home,

go on a science fictional adventure involving robots, space travel, and aliens, and still seem to make it home in time for the dinner their mother or wife prepared. This genre trope has led to a common belief that girls don't like or read SF, although Mendelsohn's (2009) findings in her study of children's and youth's reading practices suggest otherwise, and this view of SF has partly been the driving force behind concerned colleagues asking me why I research such a male-dominated genre. However, on the other hand, there is an alternative view of the genre's history as a favoured medium through which marginalized authors can openly explore alterity and difference, and it is this aspect of the genre which I focus on within this study. Taking a different approach to the history of SF, linking back to Mary Shelley's (1818) *Frankenstein* even before the pulp magazines as the first SF text, for example, an alternative to the boy-goes-on-a-fantastic-adventure trope is that SF has long presented an opportunity to imagine things as completely and radically *other*, pushing back against the hegemonic dominance of patriarchal ways of knowing.

Nalo Hopkinson (1999), in an interview with Gregory E. Rutledge, similarly navigates this path between the male, white, straight-dominant presence within the genre's history and SF's ability as a narrative medium through which marginalized voices can be heard and alterity explored. Taking on the common trope of white people colonizing planets as a significant theme in early SF as an example, Hopkinson argues that the genre long alienated marginalized peoples, particularly those suffering from the impact of colonization. She credits feminist and black writers in the late 20th century who paved the way for SF to be reconceptualized as a genre *of* alterity and the other, instead of one that views difference as an object to be examined and then subsequently cast away. Significant to this study, she celebrates voices from other experiences, such as "the working class, women, writers of color, queer writers, disabled writers," claiming a genre which, she argues, has always been subversive (Hopkinson in Rutledge, 1999, p. 591). Using her own

experience as a black writer to frame her thinking, she argues that if "black people can imagine our futures, imagine - among other things - cultures in which we aren't alienated, then we can begin to see our way clear to creating them" (Hopkinson in Rutledge, 1999, p. 593). More recent scholarship, such as Sami Schalk's (2018) exploration of speculative fiction at the intersection of black feminism and disability studies *Bodyminds Reimagined: (Dis)ability, Race, and Gender in Black Women's Speculative Fiction*, continues the thread raised by Hopkinson by focusing on the subversive potential of expansive future imaginings. To imagine things otherwise through representations of radical alterity in contrast to the status quo is a significant aspect of the genre, as is represented not only in the diversity of SF texts being written, but also in the range of ways SF is being used in order to think *with* alterity, as is explored through additional examples that follow.

For Haraway (2016), there is much to be learned from SF texts, for example from Octavia Butler's work, which explore the "problem of destruction and wounded flourishing – not simply survival – in exile, diaspora, abduction, and transportation," and claim space for the displaced in future imaginings (p. 120). In Pearson, Hollinger, and Gordon's (2008) *Queer Universes: Sexualities in Science Fiction*, a comparison between queer theory and science fiction as kindred projects which seek to imagine "a future that opens out, rather than forecloses, possibilities for becoming real, for mattering in the world" is explored through an emphasis on the presence of alterity in SF (p. 5). Furthering this exploration, Alexis Lothian (2018) in *Old Futures: Speculative Fiction and Queer Possibility* similarly takes up the radical potential of future imagining, albeit through queer temporality which disrupts the temporal linearity so common in much SF. Building off of William Gibson's assertion that the "future is already here, it just isn't evenly distributed" (Gibson in Lothian, 2018, p. 4), she examines "what imagined futures mean for those *away from*

whom futurity is distributed: oppressed populations and deviant individuals, who are denied access to the future by dominant imaginaries, but who work against oppression by dreaming of new possibility" (pp. 4-5). For Lothian, and for other scholars and writers cited here, the shifting landscape of SF towards myriad, plural futures is of critical importance. And as a final example, in Lavender III's (2011) foundational text *Race in American Science Fiction*, he explores the 'blackground' of SF, the ever-present other that exists within the alien, as he navigates the problematic link between SF and white dominance, and the simultaneous possibility of using SF to think about race differently. With these examples, albeit in no way exhaustive of the range of work being done on exploring difference through the genre, the presence of a kind of radical alterity in SF against the backdrop of a problematic, exclusionary history is a significant inspiration for this project; the focus was not to guide students through shallow extrapolative projects of the present into the future which reinforce entrenched and exclusionary worldviews, but rather to explore the dynamic and unpredictable possibility that radical alterity provides within the genre to dramatically see things differently.

Science Fiction and Teaching

Although many scholars argue that SF is a unique vehicle through which change and difference can be explored, there is little contemporary classroom-based research on the use of SF to engage students in future-oriented pedagogies. This project therefore contributes to addressing this gap in scholarship. Given the increased popularity of SF within creative industries, the genre is an indispensable and simultaneously under-utilized tool to support students as they interact with significant social change in both global and local contexts, face the increasing impact of technological and scientific progress, and explore the related social and ethical implications of such advances. While the amount of work at the intersection of SF and education is increasing

outside of in-school research, there remains a dearth of research specifically on the use of SF in high school English classrooms, and even less so on using SF in English classrooms to teach towards the future. A wide range of texts on the subject are either outdated (Allen, 1975; Benford, Delany, Scholes & Friedman, 1979; Calkins & McGhan, 1972; Elkins & Suvin, 1979; Williamson, 1980) or are about the use of SF at the undergraduate level in the humanities (Hellekson, Jacobsen, Sharp & Yasek, 2010; Sawyer & Wright, 2011; Westfahl, & Slusser, 2002).

There are outlying texts that explore young adult SF as a subgenre, but they do not focus on pedagogy (Gilbert-Hickey & Green-Barteet, 2021; Mendelsohn, 2009; Sullivan, 1999), with the rare exception of Joseph W. Campbell's (2019) work on SF and dystopia. Particularly given the proliferation of dystopian media, there has been an increased interest in dystopian and utopian fiction for young adults (Basu, Broad & Hintz, 2013; Hintz & Osry, 2003), but this work seldom acknowledges SF specifically or how SF can be used as a pedagogical tool. When attention *is* paid to mobilizing SF in K-12 education, it is seldom in the context of literacy. An outlier is Sarah E. Truman's (2019) study exploring speculative storytelling and writing in secondary classrooms, which she argues can be a catalyst for students individually imagining new, different, and potentially better futures. However, a few dominant threads remain present across the literature: texts which take a defensive stance as opposed to a practical one in justifying SF being used in the classroom (Bucher & Manning, 2001; Cook & Dinkins, 2015); considerations of SF in relation to technology in education (Alexander, 2009; Andrews, 2015; Berne & Schummer, 2005; Mason, 2013); or work that explores the use of SF in subjects other than English, most notably in science courses (Oravetz, 2005; Singh, 2014; Smith, 2009; Subramaniam, Ahn, Waugh, & Druin, 2012; Vrasidas, Avraamidou, Theodoridou, Themistokleous & Panaou, 2015). Karen Hellekson, Craig B. Jacobsen, Patrick B. Sharp, and Lisa Yaszek (2010) in *Practicing Science Fiction: Critical*

Essays on Writing, Reading and Teaching the Genre identify that one of the significant challenges of teaching SF is that resources are spread haphazardly across various disciplines and mediums, without a coherent 'centre' for resources on SF pedagogies (p. 8-9).

Given this, it is perhaps unsurprising that no comprehensive, contemporary study on the use of SF texts in secondary school English exists; rather, instead of a survey of texts used, it is often singular instances of individual teachers' mobilization of SF texts and pedagogies that are explored in isolation and driven by teachers' personal interest and motivation. Even still, the use of SF in secondary English classrooms rarely moves beyond texts that are treated as 'literature' which happen to take place in the future instead of as genre fiction (perhaps because of their white, male authorship and inclusion in school-sanctioned literary canons); popular SF texts included frequently in secondary English curricula include George Orwell's (1949) *1984*, Aldous Huxley's (1932) *Brave New World*, John Wyndham's (1955) *The Chrysalids*, and Ray Bradbury's (1953) *Fahrenheit 451*. Drawing from Carmen Lee Holota's study of texts used in secondary English in Saskatchewan (Holota, 2017), Brenda Reed's similar survey in (Ontario 2004), Allison Skerrett's (2010) comparative survey of US and Canadian secondary English classroom contexts, and Mackey, Vermeer, Storie, and Deblois' study in Alberta contexts (2012), most already rare secondary English SF selections stick closely to the aforementioned texts, and teachers' choices are limited largely by what is available in the 'book closet' at their schools. Regarding the texts listed above, their common treatment as 'real' literature instead of SF also mirrors earlier justifications for teaching SF at all; these texts are seldom taught for the particular affordances of SF but, rather, because they are already part of Western canonical traditions.

Similarly, much of the early writing on SF in education focuses on justifying SF's place in schools in general, given the challenges faced by early scholars to be acknowledged as doing 'real'

academic work (Westfahl & Slusser, 2002). As a result, focus on genre conventions that make SF distinctive and different from other narrative forms are minimized in early educational texts on SF in order to position SF as more akin to 'real literature' in the approaches advocated for in much of this work, and the future as a significant setting for SF is positioned as an enjoyable novelty of the genre. Contemporary texts on teaching SF at the postsecondary level are more attentive in this regard, but largely take the form of 'how to' guides for designing post-secondary courses meant to introduce students to the genre. While content can be adapted for use at the secondary level, with texts such as Andy Sawyer and Peter Wrights' (2011) *Teaching Science Fiction* being an excellent example of balancing breadth and depth within genre studies, the future is still largely in the background of these educational explorations.

As stated above, use of SF in secondary education is most commonly researched in the context of science and technology education, with an emphasis on predictive uses of the genre, anticipating scientific and technological innovation, or verifying the credibility of science in SF texts as an assessment of scientific knowledge, signifying that even within science education, the future is not foregrounded as a pedagogical opportunity. Mendelsohn's (2009) *The Intergalactic Playground* is a text which stands out in terms of using SF texts in language classrooms in ways which highlight, instead of dismiss, characteristics which make SF a unique educational genre, but more work is necessary to build on this content in secondary contexts where the possibility of student engagement with the future through the genre is celebrated. As Andrew M. Butler (Butler in Sawyer & Wright, 2011) notes, if taught purposefully, SF can inspire a breakdown of the grand narrative of one present leading to one knowable future. The potential that SF has to facilitate this kind of move towards temporal exploration and an embracing of uncertainty in secondary school contexts is largely missing in existing research, and as such, is addressed in this study.

Future pedagogical imaginings

Although, as detailed above, some research does exist on both teaching SF and teaching *with* SF, little exists on teaching educators about pedagogical possibility through SF, and how SF can be used to explore previously unimagined educational structures and approaches to teaching. An exception is Weaver, Anijar and Daspit's (2004) collection on reimagining education through science fictional modes of thinking *Science Fiction Curriculum, Cyborg Teachers, and Youth Culture(s)*. The authors introduce the collection by making the following assertion:

> Science fiction can and does provide a medium through which the future of education is visualized, through which educators and students can contemplate and reflect on the consequences of their actions in this world. Science fiction provides a genre, a medium through which the future can be speculatively visualized in the present. (Weaver, Anijar & Daspit, 2004, p. 1)

They advocate for SF to be seen as an opportunity to think of education *otherwise,* transcending the confines of present-day educational trends and praxis, viewing the future as open to possibility, and conceptualizing curriculum as a kind of science fiction, with interplay between the present and the future acting within educational planning. However, this text is an outlier in its emphasis on using SF not to supplement education as it is, but as a mode through which education can be radically thought of anew. The second part of this study therefore contributes to not only exploring the use of SF in teaching, but how science fictional and speculative pedagogies can facilitate explorations of what education *could* look like and inform pre-service teachers' developing practice.

Futurity & Education

Education is positioned to play a significant role in how students view the future and understand their relationship to it, but there is seldom space provided for young people to engage in 'futures talk' in ways that move beyond the pragmatic, systematic confines of school (Priyadharshini, 2019). In this work, I therefore argue that the way the future is approached in schools currently is inadequate and does not effectively account for the full range of young people's complex feelings towards the future or, relatedly, to the present and their ability to effect meaningful change. There is a clear need for new, contextually appropriate pedagogical responses to contemporary reality that are better suited to a fast-paced, and increasingly challenging, world. As Barbara Adam and Chris Groves (2007) in *Future Matters: Action, Knowledge, Ethics* argue, how cultures and societies view the future has always shifted historically in accordance with the dominant contextual needs and worldviews of the time (p. 1), and the linear, progress-oriented conception of present action and the future which characterized industrial modes of thinking and advocates for mastery over the future is no longer sufficient in an era of increasing change, uncertainty, and unknowability (p. 31). This is reinforced by the claim that "to make sense of the world is to practically remake it; the world is not "fixed and found" but is always in the process of becoming" (Vervoort, Bendor, Kelliher, Strik & Helfgott, 2015, p. 64). Too often students are taught the way things 'are,' without being explicitly taught that they also have the ability to change things that they find wrong about the world and actively move towards what 'could be.' Narratives of mastery over the future largely eliminate a kind of educational experience that is active, engaged, open to change, and positioned as a continual process of becoming.

The limits of future-oriented mastery

Contributing to this problematic conception of future-oriented pedagogy, emphasis in contemporary educational practice, as exemplified in *The Ontario Curriculum for English* (Revised 2007), is overwhelmingly placed on mastering 'skills' that are implicitly linked to future-oriented problem solving and success in competitive global markets (Geist, 2016; Kay, 2009; Kivunja, 2014, 2015). However, as Sardar and Sweeney (2016) insist, teaching towards control instead of helping students reshape their views of uncertainty is unsustainable, and will ultimately be unmanageable as the future inches ever closer to the present. Another line of thinking at the intersection of futurity and education identifies the hopelessness that neoliberal, capitalist societies impose on youth, with authors noting how market-driven conceptions of the future create a limited view of success which students are expected to strive towards, with little room for alternatives (Amsler & Facer, 2017; Duggan, Lindley & McNicol, 2017). In spite of these observations, a large swath of research on future-oriented pedagogies emphasize the importance of prediction, preparation, and control over future outcomes stemming from the present, many using aspects of SF to meet those ends (Johnson, 2011; Bina, Mateus, Pereira & Caffa, 2016; Birtchnell & Urry, 2013; Milojević & Inayatullah, 2015). Even scholarship that advocates for teaching individuals to live with uncertainty in their everyday lives still call for measures to minimize the weight of such uncertainty (Kuzmanovic & Gaffney, 2016) through various processes such as pre-rehearsals and pre-enactments of potential occurrences, with an emphasis on future preparedness. Although there is a place for resiliency building and, indeed, these efforts might be a crucial part of humanity's survival during times of great upheaval, questions remain regarding the longevity of such efforts to minimize the effects of uncertainty instead of focusing on a shift in disposition towards

unknowability. There remains a dearth of research on teaching towards, instead of away from, the inevitable uncertainty that characterizes times such as those in which we, and our students, live.

Teaching towards uncertainty. David Hicks and Cathie Holdens' (2007) assertion that the "need for futures to be explored in school [...] is still not widely recognized" and that there remains "a lack of innovative teaching materials that draw on crucial insights from futures studies" further signals this gap in research, reinforced by the fact that much of what does exist treats the future as a shallow extension of the present (p. 503). Hicks and Holdens' "Remembering the Future: What do Children Think?" and Anita Rubin's "Hidden, inconsistent, and influential: Images of the future in changing times" (2013), are both works identifying the emotional weight of this lack of address in schools, with students negatively impacted emotionally by feelings of helplessness and an inability to effectively master the future as dominant narratives suggest they must do. Rubin's findings in particular illuminate a disconnect between students' and teachers' perceptions of hope in their individual futures and an increasingly dismal view of national and global future prospects. In spite of feeling hopeful regarding their individual futures, both youth and educators in Rubin's study communicated fears regarding the speed of change and the shifting nature of reality, specifically noting feelings of helplessness, loneliness, vulnerability. They express an overwhelming sense of inability to act impactfully in an era characterized by sudden crises and the inability to fully comprehend the limits of contemporary possibility (Rubin, 2013, p. S39-40). Rubin describes the problem as a struggle to accept the perpetual incompleteness of the future, asserting that:

> As a result of globalization, technological innovation, and environmental *problematique*, culture is continuously taking form, specifying and reforming itself. The limits of the possible are constantly recreated in our current reality, pushed further, and outlined anew,

> only to be overturned in the next breath in the light of new information. (Rubin, 2013, p. S40)

In Rubin's view, it is impossible to keep up with the constant onslaught of changes which characterize contemporary experience, and the fruitless efforts to do so result in anxiety and a sense of helplessness. The speed at which change occurs and the unpredictability of the future is approached in education as something to tame or manage, but Rubin's findings suggest that this approach is insufficient. The way the future is taught towards must shift, then, seeing as it is not possible to know definitively what the future holds. Educational efforts must help students and teachers alike build a different, more open disposition to this unpredictability and the inevitability of change so that students can withstand a certain amount of unknowability, and still act meaningfully in the present.

Positive perceptions of the future. In literature that approaches the future in positive terms without attempting to eliminate uncertainty, unknowability, and unpredictability, collaborative learning and a community-oriented approach to exploring one's complex relationship with the future is a common suggestion (Hicks & Holden, 2007; Rubin, 2013; Green & Gary, 2016). Teaching about and through the future in this sense involves adopting the following approach:

> [....] rather than focusing exclusively on teaching the material, the teacher would attend to the students' capacity to symbolize and integrate the new material. Because we want the students to conceive of the unknown as a source of renewal rather than as a threat to the ego we need to teach them how to approach the unknown in a way that promotes the former and reduces the chances of the latter. (Green & Gary, 2016, p. 59)

Future-oriented pedagogy, in the context of contemporary trends in futures studies, is necessarily less prescriptive and more community-oriented than pedagogies rooted in pragmatic skills and mastery. This work of dismantling the broader narratives of singular, controllable futures is crucial, especially given opportunities for further elaboration of pedagogies that remain open to the unknown, and it is this idea that this study builds upon.

Conclusion

SF scholars continually grapple with the task of cohesively defining the genre, a challenge that has become more difficult in recent decades given the way that SF has become an integral part of popular culture and mainstream media, expanding outside of its original scope as a niche literary form. However, this struggle to establish the boundaries of SF can itself be viewed as characteristic of the genre, with SF becoming an open opportunity for exploration: *what is SF? How do we think about SF (versus other speculative genres)? How does it help us think about the future (and the present) differently?* This is a fitting way of viewing a genre that many see as committed to representations of difference, change, and interruption. However, scholarship at the intersection of SF and education seldom emphasizes this capacity to disrupt, particularly with regards to present overarching narratives of the future. This area is especially lacking in secondary school contexts, with efforts in using SF in high school seldom taking advantage of the narrative qualities of the genre to address the concept of the future. Even more sparse is research about using SF as a mode through which education can be reimagined, although characteristics of the genre make SF a promising vehicle through which pedagogical change could be fruitfully explored. There is also a lack of scholarship on pedagogically framing uncertainty, unpredictability, and unknowability of the future, both through SF and more broadly, and work is desperately needed to foster in students different ways to approach unknowable futures beyond narratives of control and fear. This research

therefore explores options for thinking differently about the future with both secondary students and pre-service teachers, using SF as a genre committed to representing difference in order to imagine futures in-community. In the next chapter I will share how I integrated concepts from these fields to construct a methodology for studying the impacts of mobilizing science fiction for educational uses.

Chapter Four: Methodology—World Building as Imaginative Exploration of Future Possibility

In this research I explored how the future, as both a manifestation of myriad imagined possibilities and as a temporal inevitability, features in the learning experiences of both secondary students and teacher candidates. The two-part study is designed to respond to the anxiety surrounding the future (Rubin, 2013), perpetuated in part by the individualistic and capital-oriented treatment of the future within schooling, and considers instead how collaborative storytelling might remedy individual-oriented views of the future. Privileging a collective, plural, and messy vision of the future in contrast, in this chapter I provide an overview of the two stages of this study. The first stage consists of an in-school participatory action research study which mobilized reflexive ethnographic methods (Robinson, 2014) to explore science fiction (hereafter SF) and world building with one mixed-grade English class in an urban alternative secondary school (chapter five and six). The second stage involves examination of a world building assignment that asked teacher candidates in the first year of their teacher training program to use science fictional and speculative storytelling to imagine the future of education (chapter seven).

Given the differing methodological approaches in the two phases of this research, in this chapter I will describe each stage separately, including unique contexts as well as data collection and analysis methods employed. However, in spite of this methodological difference, the language of 'stages' is used given the shared exploration underlying these two study contexts; in both the work with secondary students and pre-service teachers, the concept of speculative pedagogies in the context of future-oriented, science fictional world building is explored, with attention to the potential of collective imagining of possible futures to catalyze action within the present. In this way, the stages of this research can be seen as an enactment *of* speculative pedagogies with

secondary students in the first stage, and the application of science fictional storytelling as a method through which pre-service teachers might develop speculative pedagogical orientations *of their own* in the second. The first stage also directly informed the second, insofar as the world building work with secondary students highlighted the affordances of speculative pedagogy – a term I develop in this dissertation to characterize teaching from a position of openness towards myriad possible futures. Speculative pedagogy became the frame and mode of delivery that set the stage when working with pre-service teachers and their developing future educational imaginaries.

STAGE ONE: Science Fictional Storytelling in Secondary School Contexts: Toronto 2049

The first part of this research took the form of a participatory action research study (Creswell, 2012, p. 577) that utilized reflexive ethnographic methods (Robinson, 2014). Conducted from the beginning of March through to the end of May of 2019 in one secondary English classroom, the in-school research stage of this study involved 20 students, 14 consistently participating, and 1 participating teacher. The first stage of the study subsequently informed the redesign of the world building exercise used with teacher candidates in the latter parts of this research. In the in-school portion of the study, which this research design section largely focuses on, student engagement with world building occurred in three stages: (1) engagement with SF texts and genre conventions; (2) collaborative world building; and (3) individually written pieces based on the collaborative world building project, which took the form of entries on a wikimedia platform. World building, as noted before, is a term used here to describe the creative process that SF and speculative fiction authors employ to construct the worlds in which their stories take place, is framed in this research as a storytelling approach which can be adapted for the classroom. In this stage of the research, students engaged with SF texts, analyzed narratives by examining the

textual worlds created by authors, directors, and game designers, and collaboratively mobilized speculative storytelling modes to imagine the future of the city in which this research took place.

Prior to students' world building work, the first month of the case study involved conducting observations and gathering field notes while observing regular classroom practice, and building rapport with the classroom community before participatory action research-driven interventions occurred. The writing of fieldnotes in this portion of the study was supplemented with audio and visual recording, in addition to an introductory written response (Appendix A) at the beginning of the study which asked students to reflect on their dispositions towards the future, their hopes and fears concerning both their own futures and broader conceptions of the future, and how both near and far futures are discussed in school. Data collection early in the study focused on the following research question: *What are students' thoughts on the future, including their hopes, fears, and approaches to planning for the future, and how is the future explored in classrooms?* Early observational field notes and students' written responses, supplemented by semi-structured group interviews at the beginning, middle, and end of the world building project, also helped me explore the question: *How does student disposition towards the future affect their sense of agency and active engagement with issues in the present?* In the latter interviews, focus shifted to exploring if and how students' feelings about the future changed throughout the study. This question was also answered through observations of student interactions during the world building project, focusing on how students navigated the future as a site of contestation and negotiation. Finally, observations, fieldnotes, audio and visual recording of the SF genre mini-lessons and world building project, written responses prompted by open-ended questions about their feelings about the future at the end of the study, and analysis of the world building project and writing students did as part of the project in the last two months of the study contributed to

answering my final research question for the first stage of my research: *How can science fictional world building facilitate students' engagement in democratic, collaborative decision making about the future, without foreclosing on the concept of uncertainty, and a plurality of perspectives and possibilities?*

Drawing from Ethnography and Participatory Action Research

This study's research design was informed by two broad methodologies: ethnography and participatory action research. Ethnography, as described below, frames my view of a classroom as a community and my desire to not only study the curricular intervention of speculative world building, but also understand that work in the context of how the class, and by extension the school, functions holistically. Atkinson and Hammersley (2007) begin *Ethnography: Principles in Practice* by discussing the history of ethnography as an anthropological methodology characterized by extended researcher encounters with various social and cultural groups, often involving researchers embedding themselves in cultures other than their own. However, they ultimately note that, heading into the latter half of the 20th century, the nature of ethnographic work shifted and no longer has a standard, concrete definition given the changing landscape of social science research (Atkinson & Hammersley, 2007, p. 2). What Hammersley (2006) argues distinguishes ethnography from other qualitative methodologies is an orientation towards "a form of social educational research that emphasises the importance of studying *at first hand* what people do and say in particular contexts" (Hammersley, 2006, p. 4). How this looks varies, and today even includes elements of quantitative and mixed methodologies, although qualitative methods are still given preference in ethnographic work broadly.

Atkinson and Hammersley go on to describe common features of ethnography instead of attempting definition, touching upon the following elements: study of people's actions in everyday

contexts or 'in the field' instead of within experimental spaces set up by researchers; data gathered from a wide range of sources; data collection as an 'unstructured' and organic process; a focus on a few cases, or a single group over a longer period of time; and data analysis which involves "interpretation of meanings, functions, and consequences of human actions and institutional practices, and how these are implicated in the local, and perhaps also wider, contexts" where what is "produced, for the most part, are verbal descriptions, explanations, and theories; quantification and statistical analysis play a subordinate role at most" (Atkinson & Hammersley, 2007, p. 3). Christopher Pole and Marlene Morrison (2003) in *Ethnography for Education* take a different approach to initial considerations of ethnography by describing what ethnography can achieve, namely rich descriptions, insight into 'insider perspectives,' however partial they might be, and an account of a setting that is grounded in collected data and focuses on social action (p. 4). For Pole and Morrison, a key element of ethnography in general is a closeness between the researcher and the group being studied beyond a "distanced, scientific and objective" account of the social world, with an emphasis on the constructed nature of meaning and social reality (2003, p. 5). Given that one of the goals of this project is to understand how and when the concept of the future appears in English classrooms and what students' perspectives are regarding the future and their involvement in its potential realization, ethnography and ethnographic methods viewed in this way provided an opportunity for complexity and depth otherwise difficult to achieve in shorter, more distanced methodological explorations.

Reflexive ethnography

For this study I drew primarily from one specific variation on broader ethnographic practice: reflexive ethnography. Reflexive ethnographies involve the use of ethnographic journals as a form of both data gathering and analysis where the researcher continually reflects on their role

within the study and adapts to the needs and desires of those involved in the research (Robinson, 2014). Although Pole and Morrison use the term ‘postmodernist ethnography,’ their description echoes writing on reflexive ethnography. They describe a type of ethnography that focuses on,

> [...] relationships developed in the field; the characteristics of the researcher, and how these relate to the people in the field; time and circumstances in which the research was carried out; the methodology and fieldwork practices used; and broader educational, socioeconomic, and political contexts in which the research took place. (Pole & Morrison, 2003, p. 78)

Hammersley (2006) insists that one of the major challenges of ethnography is researchers believing that they are seeing things ‘how they actually are,’ and reflexive, or postmodern, ethnography addresses the necessarily constructed and partial nature of what is observed, and the researcher’s part in constructing experience and space. Integrating a reflexive ethnographic methodological orientation alongside conceptions of postmodern ethnography reinforces the need for the researcher to continually reflect on context, while centering the always plural, always incomplete understanding of the researcher’s own observations in light of multifaceted participant contexts and experiences. In subsequent findings chapters, this is a critical aspect of this work, particularly given the importance of political and social context in my understanding of the world building work that students did, and the role of participatory action research as a disruption to regularly anticipated classroom learning.

Attentive to this dynamic, in her article on ethical issues in reflexive ethnography “Dilemmas and deliberations in reflexive ethnographic research,” Janean Valerie Robinson (2014) notes the significant role that taking on a reflexive ethnographic approach had in her research on behaviour policy in a secondary school in Australia:

> [...] reflexive ethnography was paramount during my research as I was not only observing and recording during the process, but also playing an active role in revealing the position and situation of students as the marginalised and often voiceless player within the policy enactment. I often relied on these field notes and journal writing for security in dealing with all sorts of dilemma, especially in providing the opportunity to reflect and therefore understand some of the uncomfortable scenarios encountered. (p. 197)

While in this study my research is not focusing on marginalization specifically, students' varied identities were necessarily a part of the contested site of science fictional futures, and reflexive ethnography allowed me to process and adapt accordingly to the shifting dynamic of the group throughout the study. I echo Robinson's sentiments in my approach, mainly that I endeavoured to research *with* the students, rather than engage in research done *on* or *to* them (2014, p. 204). This therefore involved seeking balance between participant-based and analytic understandings of perspectives, activities, and actions, which were occasionally in conflict. For example, in navigating the work that students did during collaboration sessions, I had to account for both students' *experience* navigating disagreement during the collaborative storytelling process, and the *opportunities* afforded by making space for generative disagreement. While students often stated that they felt at a stand-still in their planning that proved frustrating at times when they disagreed, taking a reflexive approach to ethnographic inquiry helped me build an understanding of the spaces I inhabited that complicated and deepened my understanding of students' world building experiences both from their perspectives, and from my own as a researcher interested in the role that disagreement plays in collaboratively imagining future possibility in educational spaces.

Teacher/Researcher Collaboration. Reflexive ethnography also influenced my approach to collaboration, as I continually worked with the participating teacher to ensure the study was responsive to both curricular demands and students' shifting emotional and creative needs within the world building process. The curricular interventions, detailed below, were collaboratively constructed with the participating teacher, and our formative debriefing throughout the study influenced and shifted the trajectory of the study as I reflected on how my ideas changed throughout this research. Particularly during the SF and world building unit (Appendix D), discussions that the teacher and I had following lessons directly informed changes to subsequent lessons based on her interpretations of student learning, alongside students' own expressed opinions and experiences. Given the unique program structure of this alternative school – designed to prioritize communicative collaboration between teachers, educational staff, and students, attuned to the unique needs of students re-entering the educational system – student and teacher feedback were often consistent and provided relatively unified direction regarding curricular revisions and redesign. This collaborative approach to the curricular design with both the teacher and students, alongside student and teacher feedback on interview transcripts and a revisiting of students' answers on an informal basis, helped me center reflexive collaboration as a key part of this research and to ensure students felt their study participation authentically represented how they felt about and wanted to explore the concept of the future. For example, while the world building project described in chapter six was tailored to inform the research questions underlying this study, students ultimately determined the direction the world building project would take and what 'mattered' within their imagined future. Spanning unanticipated topics like the legalization of psychedelic drugs and contemporary abortion laws, students' self-directed discussions pushed the scope of what I had imagined this research encompassing as I sought to explore students'

imagined futures, and the issues they desired to pursue. Taking a reflexive ethnographic approach, with collaboration at the methodological centre, allowed this kind of flexibility within the research process. Accordingly, this ethnographic approach ultimately reinforces the primary concepts which underlie this study: an emphasis on radically democratic engagement and contestation, the uncertainty which characterizes contemporary forms of knowing, and the plural, multiple, and always incomplete nature of the future.

Participatory Action Research

The ethnographic approach described above was framed within the context of participatory action research, a research approach employed by teachers in which they teach through a challenge they are seeking to understand and/or improve upon in their practice, in order to gain a better understanding of students' dispositions towards and thoughts about the future, and how SF provides fertile ground for dynamic engagement *with* the future. While ethnographies often do not involve any active kind of intervention on the part of the researcher, Hammersley (2006) notes that there are instances in which researchers can balance 'discovered' and 'constructed' contexts within the same ethnographic case study (p. 6). Bronwyn T. Williams' and Mary Brydon-Miller's (2004) "Changing Directions: Participatory-Action Research, Agency, and Representation" is a critical text that has informed my blending of ethnography and participatory action research, as the authors problematize how ethnographers stand idly by and observe their subjects, instead of working with participants "[...] to identify important issues, generate knowledge that belongs to everyone involved, and work toward tangible social change" (Williams & Brydon-Miller, 2004, p. 243). In their view, a mixture of ethnography and participatory action research can be used in literacy research to destabilize narratives of mastery in literacy learning, and further emphasize multiple forms of literacy that exist and overlap in communities of practice (Williams & Brydon-Miller,

2004, p. 243). They argue that this mixture of methodologies helps to orient ethnographies in active moments of educational possibility, facilitating a wider range of experiences where students, teachers, and other community members can democratically engage in issues-based literacy learning. Roman (1993), through an analysis of her own position as a researcher, pushes this argument further, arguing that complete objectivity and a 'fly on the wall' approach is impossible when faced with ethical dilemmas working with research participants, and that a balance of distance and intervention is required of the researcher. In this study, elements of action research are therefore used to guide, albeit loosely, this kind of balance in this study.

Action research is defined by John W. Creswell (2012) in *Educational Research: Planning, Conducting, and Evaluating Quantitative and Qualitative Research* as "systematic procedures done by teachers […] to gather information about, and subsequently improve, the ways their particular educational setting operates, their teaching, and their student learning" (p. 609). Processes of looking, thinking, and acting characteristic of participatory action research were therefore used to design, implement, analyze, and revise teaching units used within the study based on student response and learning outcomes (Creswell, 2012, pp. 616). This process informed our co-construction of the units designed for the study, drawing initially from the participating teacher's experiences with her students to inform our instructional materials. Following the first month of the study, her and I returned to the unit to revise individual lessons, and continual processes of implementation, analysis, and revision of specific activities occurred on a continual basis throughout the study. For example, in a full-class reading of the short story "The People of Sand and Slag" (Bacigalupi, 2004), the first day of reading together involved reading a large section with short clarifying discussions, followed by one longer full-class discussion. However, upon joint analysis through formative debriefing (described in the next session), we revised our

approach by more evenly balancing reading and time for discussion to allow for continual student engagement and processing the story based on SF genre characteristics.

The cyclical action research process, in conjunction with more reflexive and collaborative approaches to ethnography, allowed for an active exploration, learning *with* students and the teacher instead of imposing research and learning *on* students. In the above example, we took cues from students' discussions and restructured our approach to full class reading to make space for deeper, consistent engagement with the story as we read. Importantly, this meant students' insights into how they wanted to engage with the text directly informed our approach to this part of the SF unit; students would say when they wanted to discuss something, and our new structure provided those opportunities. This is particularly important in the context of future-oriented pedagogies, as this provided participants with an opportunity to think about the future in both 'discovered' and 'constructed' ways. In particular, while many of the findings are centered around the world building project and other curricular interventions, observations of the class in the first month of the study and consideration of informal conversations during work periods also opened opportunities for me to engage organically with student perspectives. Although unconventional, supplementing my ethnographic exploration with elements of participatory action research and its corresponding methods fit well with characteristics of ethnographies more broadly, namely the use of a wide range of data collection methods in order to engage in sites with increasingly more depth and complexity (Hammersley, 2006; Walford, 2009), leading to a nuanced understanding of how students engage with the future in educational spaces.

Data Collection

Data collection for the first stage of the study was designed using within-method methodological triangulation, described by Pamela Morris (2018) as "the comparison of two or

more forms of evidence with respect to a single object of research interest" (p. 1782), in order to gain a holistic, nuanced understanding of how students were thinking about the future and how their ideas changed through engagement with and creation of speculative narratives. Multiple data collection methods helped me understand students thinking at multiple points throughout the study, allowing comparative analysis across time, and analysis of students' engagement with content from "more than one direction" (Morris, 2018, p. 1782). In the first stage of the study, the following primary sources of data were collected for analysis:

1. Fieldnotes and Formative Debriefing - Ethnographic fieldnotes during the study, and formative debriefing after each lesson with the teacher.
2. Interviews - Interviews at three points during the study: Before the SF unit, after the SF unit, and at the end of the study. Interviews were framed as opportunities for students to share their thoughts on the future, their understanding of SF, and their world building experiences.
3. Student Dialogue/Collaboration Meetings - Four collaboration meetings to scaffold the project, supplemented with formal and informal planning meetings on an as-needed basis as determined by students.
4. Student Work and Contributions - Student work resulting from students' engagement with SF and the world building project.

Fieldnotes and Formative Debriefing

Fieldnotes are commonly used in ethnographic fieldwork to capture what occurs at the location being studied and provides a space for ongoing analysis by the researcher (Walford, 2009; Pole & Morrison, 2003). In this study, observational fieldnotes were a significant data source, and were supplemented with audio and visual recording of classroom activities, discussion, and

informal interactions during class time. Social and structural contexts were also noted in the fieldnotes, including classroom and school dynamics, and school support systems and characteristics in place that influenced students' school experiences. Fieldnotes were gathered in two parts: (1) The first month of the study, during which time fieldnotes focused initially on understanding the class dynamic prior to participatory action research-oriented interventions and navigating the initial researcher/participant relationship, then broadened to attend to the pedagogical stance of the teacher and students' experiences within the class, as well as watching for instances where conversations regarding the future and moments of contestation over texts and learning occurred in 'regular' classroom contexts; (2) During the SF genre exploration and world building project in the latter part of the study, fieldnotes focused on individual and collaborative student engagement with curricular content and creative work, trying to capture the ways students' interactions evolved or changed when they were asked to purposefully negotiate the nature of the collaborative world building project they were designing, to see how they worked to resolve or accommodate disagreements, and to identify the general process students took with regards to the project. Fieldnotes were also informed by the content of students' wiki and interactive map contributions and both interviews and informal conversational exchanges about their work.

Formative debriefing with the teacher provided an invaluable interpretive perspective, catalyzing reflection on my own understanding of what I observed in the classroom and how I interpreted students' learning and contributions. The daily practice of writing fieldnotes and descriptive accounts of my observations and pedagogical reflections, and then dissecting them through formative and collaborative debriefing with the teacher, functioned in similar ways to ethnographic journaling, inhabiting a grey area between data gathering and analysis. These evolving notes drew from a mixture of participant interactions, other field notes, reflections, and

aspects of the theoretical frameworks underpinning this research (Robinson, 2014), and helped me to maintain an ongoing reflective research practice throughout the study.

Interviews

Semi-structured group interviews occurred at three points in the study so that students could share their perspectives on the overarching topics explored and, later, voice their opinions on SF, the world building project, and provide feedback on the process. The interviews occurred at the end of months one, two, and three, and focused on the following topics as detailed in the table below:

Table 4.1

Interview Summary by Date, Focus, Keywords, and Participant Count

	Date	Focus	Keywords/Concepts	Number of Participants*
1	April 1, 2019	Engaging with General Themes of the Study	Collaborative learning, science fiction, the future and future studies, the future in education, democracy and the future	11
2	April 30, 2019	Reflecting on Science Fiction	Science fiction, popular media, storytelling, the relationship between the present and the future, future imaginaries, varying media forms and storytelling, narrative as thought process	10
3	June 3, 2019	Reflecting on the World Building Process	Democracy, collaboration, digital storytelling, creative writing, creative process, future imaginaries, disagreement, preferred futures, anticipated futures, action, change.	7

*Attendance varied widely throughout the study, given the nature of the study site as an alternative school with flexible attendance protocols to accommodate student needs.

The participating teacher and I reviewed interview questions (Appendix B) prior to each interview, and the physical and pedagogical arrangement of the interview was negotiated based on my data collection goals and the teacher's knowledge of her students' comfort levels and needs when engaging in group discussion. Accordingly, interviews were audio recorded instead of video recorded, interview questions were provided to students ahead of time, and any questions the teacher anticipated might be confusing were supplemented with reframed questions where applicable.

In the first group interview, we focused on exploring students' perspectives on the future broadly and their experiences discussing the future in school. In addition, I sought to better understand how they form their opinions on the future (e.g. through the news, social media, popular culture), and how they viewed present and future-oriented change more generally. Analysis of this interview was supplemented with an introductory written response distributed at the beginning of the study, that asked students to discuss their views on the future individually and on a societal level. The second group interview followed the unit on SF, and examined how students' perspectives on the future did or did not change based on their engagement with future-set narratives in a variety of forms (e.g. television, film, novel, short story, video game, etc.). This interview also asked students to consider the relationship between the authorial present, the reader's present, and imagined futures, in anticipation of the world building project. In addition, we discussed how students perceive the impact that popular culture and storytelling has on societal views of change and future possibility. The final group interview occurred at the end of the study, and provided space for students to collectively reflect on the world building project from both a

process and conceptual perspective. In this interview, students were asked to consider challenges and opportunities posed by their collaborative storytelling experience, how the project might have impacted their views on present action and future change, and the role that schools might take in facilitating discussions about future possibility differently. The choice to hold group interviews instead of individual interviews is based on findings that suggest that students are often more comfortable engaging in group interviews (Robinson, 2014; Pole & Morrison, 2003), and also that group interviews provide researchers with opportunities to analyze not only the content of responses, but also how what students choose to say they believe is important, is socially constructed in community with others (Pole & Morrison, 2003, p. 30; Roman, 1993, p. 291). Accordingly, transcripts of interviews included not only students' answers to interview questions, but also included student-to-student interactions and reactions to each others' contributions.

An interview was conducted with the participating teacher (Appendix C). to provide an opportunity to share her perspective on her experiences throughout the study, and to reflect on the collaborative processes we engaged in together from curricular planning through to teaching and data collection. This interview also provided space for the teacher to share her expectations and reflections on the study experience both personally and through her observation of student learning, challenges and opportunities she noted throughout the SF unit and world building project, and any occurrences that surprised her throughout the study. Finally, this interview was also designed to explore any unresolved tensions or situations she noted throughout the study, and provide feedback regarding how our collaborative work should be subsequently disseminated and/or represented in future work.

Student Dialogue

Student dialogue constitutes a significant portion of the data collected during the first stage of the study, taking on a range of forms including: (1) student conversations and contributions during the first month of the study, reflected in fieldnotes; (2) student discussions during lessons on science fictional genre conventions and storytelling, including during group work examining texts and collaborative gameplay in support of genre exploration, reflected in fieldnotes and post-lesson formative debriefing notes; (3) dialogue as part of world building collaboration meetings, consisting of four meetings during which students were tasked with structuring and collectively imagining the future of Toronto; (4) two unscheduled long-form discussions furthering plans for the *Toronto 2049* project, as requested by students; (5) conversations negotiating collaborations between students across world building topics and areas during work periods. Student dialogue during the observational period and the science fiction unit was used to contextualize interview findings and student work, while transcribed meetings provided further insight into the nature of student collaboration in the context of future-oriented perspectives, concerns, and imaginaries. Given the theoretical significance of radical democracy in this study, longer, transcribed discussions also provide insight into how students navigated disagreement, uncertainty, and difference in collective storytelling contexts.

Student Work and Contributions

Referenced above in the context of the first interview, written responses to a series of short answer, open-ended questions (Appendix A) about students' general thoughts on the future were collected at the beginning of the study to provide students with another way to offer their perspectives on the future in addition to interviews and in-class discussions (Luttrell, 2000). These answers were used better understand how students' ideas about the future changed throughout the

study when compared to subsequent discussions regarding their perspectives on the future throughout the study. Student classwork throughout the SF unit and the world building project were also collected as data. In the SF unit, student work included: (1) a graphic organizer used to assist students in analyzing the pilot episode of the SF series *The 100* through SF genre characteristics (e.g. the novum, extrapolation); (2) annotated excerpts from different SF short stories completed in groups, with an emphasis on how language and world building strategies are used to build settings in speculative texts; and (3) SF inventories, the primary assessment for the unit that required students read or engage with three SF texts of their choosing and analyze them through genre characteristics and representations of the future as it relates to students' understanding of the present (Appendix G). Finally, the world building project at the end of the study and students' short creative writing contributions, in the form of individual wiki entries based on the fictional future the class collaboratively envisioned, provided a rich source of data. This project also included a written reflection on the world building process, allowing students to again share their perspectives in both oral and written forms.

Curriculum Development. In this section I will briefly outline the curricular resources that were developed in collaboration with the participating teacher which structured the latter, participatory action research-inspired portion of this study. This included a unit on SF that scaffolded students' self-determined exploration of the genre through various media forms and storytelling approaches across science fictional and speculative modes, and the frame for the world building project. This work was done while keeping in mind Pole and Morrison's (2003) reminder about the nature of ethnographic research:

> In ethnography's attempt to understand social action within discrete locations or social collectivities, it needs to be in a position to respond to social action as it

> unfolds, to make sense of its significance and meaning for the actors who create action and to examine the structures within which it unfolds. In this sense, the extent to which the ethnographer can plan ahead, in anything but fairly general terms is limited. (p. 11)

What follows then is an elaboration of how the world building project evolved alongside the SF genre engagement that framed the storytelling work that students did. However, this description comes with an acknowledgement of the pre-existing ideas I held regarding the participatory action research intervention of the study (the SF and world building curricular units) and the ways they necessarily changed through feedback from students and the participating teacher as we explored SF and the future together. The curriculum development process in this work was accordingly open and collaborative, and involved determining the selection of example texts for students to engage with, the nature and format of students' encounters with SF (short stories, novels, movies, video games, music) and, in consultation with the participating teacher, the structuring of assessments during the study to maintain curriculum expectations during the study based on the *Ontario Curriculum for English* (2007) in consultation with the participating teacher. Both students' desire to engage with an increasingly broader range of SF texts, and changes resulting from pedagogical and practical teacher input influenced changes in the original curricular development done in preparation for the study. Given the gradual move towards a student-determined trajectory for the *Toronto 2049* project, the world building portion of this research also shifted to suit the needs, interests, and goals of students, as detailed below.

Genre exploration. The curricular work of this study began with a three-week unit on SF and was collaboratively designed between the participating teacher and I. This process involved conceptually developing the unit and lessons, and receiving feedback from the teacher regarding

the logistics of implementation for her particular classroom context. In the working unit plan submitted to the schoolboard external research review committee in preparation for this study (Appendix D), the unit was described in the following way:

> [...] students will explore science fiction (SF) as a genre through stylistic devices such as world building and extrapolation to make connections between the futures depicted in texts with contemporary issues in the present. A range of SF resources in different mediums (short stories, novels, video games, tv shows, movies) will be made accessible to students so they can engage with the genre in ways that interest them. Both collaborative and independent exploration will feature in this part of the unit.

This unit was informed by a previous study I conducted using SF in secondary school English classrooms, and drew from student suggestions that they wanted more freedom regarding texts they engaged with, and a wider range of options spanning subgenres (e.g. dystopia/utopia, social vs. science-oriented SF, near/far future). As such, this unit was built around a culminating task: an SF inventory, which tasked students with reading and/or otherwise engaging with three SF texts of different forms (e.g. novels, movies, short stories) and analyzing them through genre devices, world building strategies, and connections to the authorial and/or readers' present. The unit was divided into 'mini lessons' based on elements of SF (termed 'SF literary devices'), including extrapolation, or the way SF futures are inspired by the author's empirical present; novums, the 'new thing' in SF texts around which the narrative revolves; and cognitive estrangement, the narrative signs that indicate the story does not take place in the empirical and temporal reality of the reader. Mini-lessons on these genre characteristics were framed as tools through which students could critically examine a range of SF texts across forms through both collective and independent

engagement. This unit also involved guided collective exposure to SF through collaborative play of the alternate-world war game *This War of Mine* (2014), a full-class reading of Paolo Bacigapuli's (2004) "The People of Sand and Slag," group readings of excerpts from SF stories including E.M. Forster's (1909; 2010) "The Machine Stops" and Ted Chiang's (2008; 2019) "Exhalation," and a guided watching of an episode of *The 100* (2014) and *Black Mirror* (2016). In addition, the unit was divided into elements of SF and aspects of world building. Students were given time for reading and independent engagement throughout.

Individual lessons were based on the general outline I provided in the unit plan, which was then negotiated by the teacher and I prior to each class to assess whether plans were still appropriate, or if they needed to be altered. The most common change was time allocated to certain tasks or lessons, with the original unit plan only spanning two weeks, or the details surrounding how tasks would be assessed. For example, alongside viewing the pilot episode of *The 100*, the teacher and I co-developed a graphic organizer to support students' note taking as they examined the episode through characteristics of the genre. In addition, the timeline for the unit was altered to allow for fifteen minutes of silent reading where possible to keep in line with previous class routines. The silent reading routine was folded into the SF inventory task, providing time for students to select texts from a provided SF classroom 'library' based on their interests surrounding the genre. This unit was positioned as a genre exploration, where students were exposed to SF in a variety of forms and were also asked to bring examples of SF 'texts' they engage with themselves to share with others. As noted above, attention was also paid to exposing students to a range of SF texts: near-future, far-future, texts that directly explore scientific discovery and innovation (biology, chemistry, physics, technological), texts that focus on the social impact of change (sociology, politics), dystopian, and utopian texts. In addition, students also engaged with various

approaches to science fictional writing (Barr, 2003; Clareson, 1971, 1977; Delany, 2005; Gillett, 2001; Gunn, 2000; Le Guin, 2014; Rieder, 2017; Rutledge & Hopkinson, 1999; Shippey, 2016; Tuttle, 2005; Wolfe, 2016), with particular attention to how SF authors glean information from the present to inform various visions of the future. Returning to John A. Weaver, Karen Anijar and Toby Daspit's (2004) collection *Science Fiction Curriculum, Cyborg Teachers, and Youth Culture(s),* this unit was based on the following assertion:

> Science fiction can and does provide a medium through which the future of education is visualized, through which educators and students can contemplate and reflect on the consequences of their actions in this world. Science fiction provides a genre, a medium through which the future can be speculatively visualized in the present. (p. 1)

Heading into the world building project, students were asked to use their knowledge of the genre from their SF inventories and our collaborative explorations to consider contemporary issues that they thought would have ramifications for the future that they imagined together, how those issues might impact future societies, and how SF and speculative storytelling might help them visualize possibility.

The World Building Project. It is at the intersection of science fictional storytelling and speculative pedagogical possibility, as represented above by Weaver et al. (2004), that this world building project was conceived (Appendix F). The *Toronto 2049* project centered around the concept of world building: a science fictional genre convention and technique that SF writers use to design the futures in which their stories take place (Csicsery-Ronay Jr., 2008; Duggan, Lindley & McNichol, 2017; Vervoort, Bendor, Kelliher, Strik & Helfgott, 2015). World building, informed

by structural characteristics of SF, encompasses the following story elements featured in this project:

- **Plot/Novum**, or the storyline the text follows based on the novum, which is the 'new thing' that acts as the primary differentiating factor between the future society envisioned and our own temporal present, and how it impacts their society;
- **Setting**, which encompasses both where the story takes place and temporal distance from the present;
- **Culture/Community**, or the sociological behaviours of the characters and broader society represented in the text;
- **Affect**, or the general feeling students-authors want the reader to feel when they engage with the SF future they have created.

These working categories were informed by texts on writing SF, most notably Lisa Tuttle's (2005) view of world building as an interconnected ecology of qualities about a fictional world spanning the mundane to the magical. The concept of world building is positioned here as a form of narrative imagination guided by the extrapolative writing process, drawing from how SF authors often gain inspiration from the present in order to construct their visions of the future. Instead of focusing solely on what SF authors do when they construct science fictional futures as an analytical tool, this concept was used to clarify the way SF can meaningfully engage students in the chaotic present moment as they work through world building process themselves.

The project was structured over five weeks around the concept of collaborative world building, or collaborative storymaking (King, 2007), a process where students work together to construct a broader story collectively, creating a frame within which individual contributions can occur (Hergenrader, 2019). Through world building, students were asked to collaboratively

imagine the future of Toronto at any point in the future of interest to them and were gradually given control over the trajectory of the project. As detailed below, students used aspects of science fictional storytelling and interactive digital storytelling tools, such as wikis and digital mapping (Hergenrader, 2017; 2019), to explore future possibility. The world building project involved students discussing their imagined future of Toronto in the form of four weekly 'collaboration meetings.' The collaboration meetings covered the following topics: (1) 'Discussing the Big Picture,' prompting students to establish the foundation for the future they imagined including how far in the future it would take place; (2) 'Exploring Challenges,' prompting students to consider societal challenges faced by those who lived in Toronto of 2049; (3) 'Exploring the Future,' dedicated to sharing contributions with one another and examining what topics required more depth to fill in the narrative world; and (4) 'Thinking about Consequence,' a meeting scaffolded to support students in spotting narrative inconsistencies across their wiki contributions ahead of writing their first person narratives. Between the meetings, students explored topics of interest to them, and subsequently 'filled in the world' in the form of wiki entries, informed by the general parameters of the fictional future and their own unique visions for the future. As detailed above, during the first collaboration meeting, students identified 'big ideas' that would shape the narrative landscape and chose to imagine Toronto in 2049. In subsequent meetings, students were given guiding questions (Appendix E) that moved them towards increasing depth and detail in the project as they imagined the future-past of Toronto in 2049, significant historical or social moments that might impact the future, and what it might feel like to live in the future they imagined.

Digital storytelling. The use of digital storytelling tools in the world building project furthered the goals of expanding upon a collective, pluralistic vision of the future through collaborative storytelling. A wiki format was used in which students built upon individual

characters, settings, events, and future histories, collaboratively filling in the ‘megahistory’ and the future-present and future-past of Toronto in 2049 (Coccetta, 2015; Forment, Pedro, Casañ, Piguillem & Galanis, 2012; Hewege & Perera, 2013). This work was structured through three ‘entries’ into the project wiki per student: (1) one entry on background information and systemic elements of the world that impacted all other subsequent contributions, like the economy, healthcare, or education; (2) a social or historical moment that influenced the future society students imagined; and (3) a first-person account from the perspective of someone living in that society. Students were encouraged to collaborate, and check-in with others whose contributions impacted their own wiki entries (such as related characters, plot points happening at the same locations, alterations to historical events within the megahistory). Significantly, using the format of wikis for students to make their contributions to ‘filling in the world’ of the future they collaboratively imagined meant students could change their entries as they worked together, allowing dynamic narrative fluidity while at the same time suggesting that the future too can change based on present decisions.

Drawing from research which suggests that engaging students in localized visions of the future is a powerful approach to future-oriented pedagogies (Bohnet, Gooch & Hickey, 2010; Duggan, Lindley & McNicol, 2017), this world was also ‘mapped’ onto a personal Google Map of Toronto that was created for this project, and students were able to use the map to upload text, images, wiki-links, and any other information they wanted to include directly onto pinned locations. Mapping is a useful element of nonlinear storytelling and learning, as mapping can provide visual context that encourages students to build on previous knowledge in different ways (Andersen, 2011), and can infuse meaning into narratives as students visualize changes in their locale (Hergenrader, 2017). Following a similar structure to the Toronto Public Library’s poetry

map (torontopoetry.ca), students were able to manipulate the map and visually 'fill in' a future Toronto, identifying areas affected by various future events such as rising waters and climate change. For example, in this project students imagined seasonal flooding up to Front St. along Lake Ontario, and various currently non-existent structural changes that would have to be implemented to combat this issue. Similar examples include re-envisioned uses of significant landmarks, and shifting populations in different parts of Toronto, impacted by imagined future events. However, as indicated in chapter six, students utilized the wiki platform as an organizational structure for the project more eagerly than the digital mapping component of this work.

These digital approaches ultimately helped students answer the following 'questions asked from within a world' with more complexity than an individual, linear narrative of the future would allow: "Who are we? Why was this world constructed like this? Where are we? How do we come to experience the world? What are sources of discomfort and gaps in this world?" (Vervoort, Bendor, Kelliher, Strik & Helfgott, 2015, pp. 67-68) The aforementioned approaches to the curriculum and world building project were designed to open up possibility for different kinds and levels of student engagement, with opportunities for students to take the lead and determine how they wanted to manage this project as they thought in a range of ways about the present and potential, contested futures.

Data Analysis

Data was analyzed thematically (Smeyers, 2008; Yukhymenko, Brown, Lawless, Brodowinska, Mullin, 2014), involving discourse analysis (Gee, 2010) and related elements of generous reading (Jørgensen & Phillips, 2002; Andrelchik, 2015), and within-method triangulation (Blaxter, Hughes & Tight, 2006; deMarrais & Lapan, 2004; Huettman, 1993). To accommodate

the extensive data that this study's ethnographic methods generated, I used NViVO to organize data, store audio and visual recordings, and to thematically code the following data sets: the introductory questionnaire, fieldnotes, written and verbal student responses, interview and discussion transcripts, and other text-based forms of data, including students' contributions to the world building project. In addition to formal approaches to data analysis, I also took a reflective approach to writing observational field notes through formative collaborative debriefing with the participating teacher, as detailed above. This work was done in conjunction with maintaining an ongoing practice of writing memos and summaries (Pole & Morrison, 2003, p. 81; Robinson, 2014) throughout the study in order to engage in ongoing, informal analysis.

Thematic Coding

Initial engagement with data involved extracting themes (Saldaña, 2012), broadly centered around processes of collaborative storytelling, interpersonal learning, and democratic engagement with collective world building through disagreement; world building application, student experiences, and student reflections on process; student perspectives on SF and applying speculative storytelling to future-oriented narratives; and perspectives on the future broadly, future agency, fear, and hope, and navigating future uncertainty in and beyond school contexts. These themes were also explored in connection with feminist, postcolonial and critical race-based critical theories connected to student identity, representation, power dynamics, institutional and systemic context, and interactions with others which impacted student participation and experience (Brodkey, 1996; Williams & Brydon-Miller, 2004), and "broader educational, socioeconomic, and political contexts in which the research took place" (Pole & Morrison, 2003, p. 78). Keeping in mind the way intersectional identities impacted power dynamics throughout the world building process in particular allowed me to better understand how different students thought about the

future, and subsequently engaged collectively with imagining a future beyond utopia/dystopia narrative binaries.

Discourse Analysis and "Generous Reading"

Discourse analysis was used to analyze various forms of student interaction throughout the study, with particular attention paid to democratic engagement, collaborative, collective decision making, and agonistic dialogue. In particular, I used generous reading, a poststructuralist approach to discourse analysis "in which the speaker's (or writer's) comments are considered linked to the context in which the speaker (or writer) speaks (or writes)" and utilized tools such as "metaphors and intertextual references to locate clues found in discourse" which lead to deeper and nuanced interpretations of students' formal and informal responses (Andrelchik, 2015, p. 136). This approach in particular emphasizes the complex ways in which knowledge is constructed, where individuals not only socially construct knowledge but also draw from a range of experiences, worldviews, and influences to respond to others in various forms. This was a particularly important aspect of data analysis, as it allowed me to better understand the ways students learned from each other in complex and messy ways as they engaged in collaborative storytelling together, positioned as they were within a range of unique life experiences, perspectives, and central concerns about both the present and future change.

Relatedly, within-method triangulation was used to further grasp the complexities of student experience within the study across data sets. The process of data collection and analysis noted above was necessarily complicated by what Geoffrey Walford (2009) describes as a key element of ethnographic research - the researcher is inevitably caught up in a spiral of data collection, hypothesis building and theory testing, leading to further data collection (p. 272). However, in spite of the challenges associated with large quantities of dynamic and shifting data

collected in this stage of the research, the objectives of this study were complemented by this kind of engagement with data, as the goal is not to make a truth claim about the way students should be engaging with the future, but rather to explore ways in which one kind of engagement (collaborative, speculative storytelling) can help students move beyond societally dominant, totalizing narratives of mastery towards embracing pluralistic uncertainty.

Teacher Education and Worldbuilding

The second stage of this study involved revising the world building project and accompanying SF genre content described above to design a speculative world building assignment (Appendix H) that engaged directly with the concept of educational change. While smaller in scope than the first stage of this study[1], research conducted with pre-service teachers offered another opportunity to examine the ways science fictional and speculative storytelling can impact education in the context of both student learning and teacher pedagogy. Building from the world building work of secondary students in the *Toronto 2049* project, this project with pre-service teachers similarly mobilized speculative narrative imaginaries and processes of world building towards exploring both present and future change, and societal, technological, scientific, and interpersonal possibility in the context of education. Its guiding questions were: (a) how do pre-service teachers' interactions with SF and science fictional world building influence their pedagogical beliefs and thoughts on education?; (b) how does exposure to SF and purposeful envisioning of the future inspire a rethinking of possible pedagogies, educational structures, and teaching methods?; and (c) in what way does exposure to pedagogies that teach towards future

[1] As reflected in the length of this section, the second stage of this research with pre-service teachers was a supplemental extension of the first stage of the study. This stage was an unanticipated opportunity to extend this work for teacher professional development and has since lead to a Mitacs-funded study with practicing teachers mobilizing speculative fiction and world building in their pedagogical and instructional practice.

uncertainty influence pre-service teachers' own dispositions towards uncertainty in their teaching practice?

Participants in this stage of the research were intermediate/senior division (Grades 7-12) pre-service teachers enrolled in a course on new media literacies at a university in Toronto, who were invited, and agreed, to submit their projects to be included in this study following course completion. Across two sections of the course, 69 students agreed to their assignments being included. The assignment 'Creating and Sharing Stories in/of Education,' was embedded in a course portfolio as a contributing assignment in which students compiled 'productions' representing their exploration of new media literacies and digital storytelling. In preparation for the assignment, students built upon previous experience using Wikimedia and other digital storytelling tools (tour builders, video production, graphic text creation) in the course, and were assigned a chapter for discussion on authentic listening in the context of community-based media pedagogies (Low, Brushwood Rose & Salvio, 2017).

Building on examples like *Mapping Memories* (mappingmemories.ca), a digital storytelling project that supports refugee youth telling their own stories using new media tools, and my previous research on science fictional world building in secondary school contexts, pre-service teachers were asked to construct their own digital storying of education through science fictional world building. This assignment asked students to reflect on their learning experiences alongside their fears and hopes for education, and create a Wikimedia page on the course platform that responds creatively to the prompt: *As things are now, what might the future of education look like?* Using an inquiry-based approach, students were tasked with determining a 'what if?' question to explore in relation to a contemporary educational issue of interest to them, construct an imagined future using speculative world building approaches, and then write from 'within' the

future they imagined. This assignment positioned listening as an important storytelling process, and students were asked to 'listen' to others as a part of their narrative future construction, both by discussing the future with others and drawing inspiration from the future imaginaries of their peers.

Data Collection and Analysis

Data consisted of pre-service teachers' Wikimedia entries, including a written reflection on the process of coming up with their educational/societal futures. Narratives were thematically coded using NVivo, attentive to both the content of students' wiki entries, and the structure of future narratives that students explored in the context of educational possibility. Students' contributions were organized according to the narrative structures offered by Wolf-Meyer (2019): extrapolation, or imagining if a contemporary phenomena are carried into the future relatively unchanged; intensification, through which the impact or quality of phenomena are magnified; and mutation, a narrative structure characterized by unexpected events and a tracing of individual and societal response (2019, p. 19). While students were asked to connect their imagined futures to educational issues of personal interest and/or explored within the course, the assignment was also structured to encourage students to think expansively about the reciprocal relationship between education and society, and the possible implications of educational change.

Thematic codes were generated by drawing upon scholarship about teaching SF (Hellekson et al., 2010; Sawyer & Wright, 2011; Truman, 2019) which builds on narrative content, tropes, themes, and structures to teach towards a changing world. In the context of this study, as reflected in the thematic coding schema, speculative storytelling is also viewed as *pedagogical*, informed by Karen Anijar, John A. Weaver and Toby Daspits' (2004) assertion that SF "can also open up students'/teachers' minds to previously unforeseen possibilities while concurrently empowering people to become curricular creators and cocreators" (p. 1). Pre-service teachers' world building

assignments were also analyzed through various narrative approaches towards imagining the future: across the spectrum of the dystopian/utopian binary (Campbell, 2019); through futures-studies and the identification of probable, possible, and preferred futures (Bell, 1998); and by tracing the use of science fictional and speculative world building approaches across what Anthony Dunne and Fiona Raby (2013) call the "methodological playgrounds of cinema, literature, science, ethics, politics, and art" (2013, p. 3). Significantly, world building assignments were also examined through future historiography, and the lenses of extrapolation, intensification, and mutation as noted above (Wolf-Meyer, 2019). I drew from Matthew J. Wolf-Meyer's work specifically because of his attention to thinking about "theories for the world to come – […] that will help to build a sustainable, equitable world after collapse" (2019, p. 18) through speculative narrative, attentive to the ways pre-service teachers used speculative world building to imagine a world beyond central issues and challenges in education that most concerned them as they reflected on their own pedagogical identities.

Conclusion: Learning from the Stories of Students and Teacher Candidates

In this chapter I described the methodology and methods I used to conduct both stages of this study, the curriculum development process that guided the SF genre work and world building project that formed the foundation for this research, and the various contexts in which I explored science fictional and speculative storytelling in education. Working with both high school students and post-secondary education students, this study facilitated opportunities to explore a range of perspectives on science fictional world building, and how it can contribute in myriad ways to thinking about the future differently in education through speculative pedagogy. As will be detailed in the following findings chapters, qualitative data was gathered and analyzed not in pursuit of one definitive answer about the best way for students to engage with the future in

classrooms, but to explore discrete examples of ways, through world building and collaborative storytelling, to engage students in more dynamic learning and thinking about the future beyond notions of mastery and grand narratives about what possibilities the future holds.

Chapter Five: Exploring (Science Fictional) Futures

"I am trying to make the future livable for my kin. I do feel responsible for the future, as should everyone. We are the future. We have the means to change the future."

AJ L., student participant

Overview

In this chapter I will examine findings from the first stage of this research on science fictional world building and speculative pedagogy, conducted in a secondary English class in the Spring of 2019. This research involved the development of two curricular units: a unit on science fiction (hereafter SF) designed to facilitate students' explorations of fictional futures in relation to contemporary challenges, followed by a world building project wherein students were tasked with using SF storytelling techniques to collaboratively imagine the future of Toronto. While the world building project serves as the primary data set within the first stage of this study and will be described in the next chapter, in this chapter I will first explore how students thought about the future in both individual and collective contexts through engagement with SF texts in preparation for the world building project. Significant to this discussion are conversations surrounding how students perceive the future in schools, examined through a pre-study questionnaire (Appendix A) and initial interviews. Following my exploration of that, I will then examine how students engaged with and reflected upon SF as both a genre and as a narrative tool through which they might engage with both the present and the future. Students' reflections on the future, SF as a genre and as a narrative orientation towards change, and world building as a collaborative and community-building process will be interspersed throughout a sharing of findings across both chapters.

Figured Worlds

In the next two chapters, I trace the complicated interplay between students' identities and experiences within the world, how they socially construct both individual and broader narratives of possibility, and the kinds of stories about the future that are often featured within educational

contexts. Working at the intersection of identity and future-oriented storytelling, I use Holland, Lachicotte Jr., Skinner, and Cains' (1998) concept of figured worlds to frame the primary problem that this research addresses, and the impact of speculative world building and collaborative storytelling on students' sense of agency and ability to imagine expansive future possibility. In the context of discourse analysis, James Paul Gee (2010) describes figured worlds and their function as:

> [...] simplified, often unconscious, and taken-for-granted theories or stories about how the world works that we use to get on efficiently with our daily lives. We learn them from experiences we have had, but, crucially, as these experiences are guided, shaped, and normed by the social and cultural groups to which we belong. (p. 76)

As Gee's description suggests, figured worlds have a utilitarian function; they act as interpretive shortcuts that allow us to understand social, cultural, and contextual phenomena and derive meaning from occurrences without having to interpret each context anew. However, since figured worlds hinge on accepting what is *typical*, the figured worlds through which we story our lives are often and necessarily exclusionary. They are frequently defined by hegemonic power structures, societal norms, and institutional standards or imposed narratives that filter what is 'acceptable' and possible within particular contexts, including the kinds of identities that students can take up and imagine for themselves. Importantly, Gee states that "as society changes what people take as typical can and does change. Figured worlds are not static" (2010, p. 71). In the context of this study, my interest is in not only understanding the figured worlds through which students think about and work towards the future and what contributes to those figured worlds but also, importantly, how those figured worlds, and how the roles youth envision for themselves with regards to the future can change: how can future-oriented storytelling shift the figured worlds

which frame students' dispositions towards the future, what the future might be and look like, and who gets to influence such futures? And specifically in this chapter, how can engagement with myriad narratives also help youth begin to re-story the future? This work with SF and world building is therefore positioned as a means of disrupting a narrow-figured world of the future, characterized problematically by individual, capital-oriented success, particularly in a time when collective action, that responds to broader society-wide and global challenges, is sorely needed.

With the concept of figured worlds in mind and the inextricable connections between figured worlds, agency, and identity, this chapter will discuss findings guided by the following research questions:

(1) What are students' thoughts on the future, including their hopes, fears, and approaches to planning for the future, and how is the future explored in classrooms?

(2) How does student disposition towards the future affect their sense of agency and active engagement with issues in the present?

The initial part of this study was designed to better understand students' orientations towards the future and, significantly, what kinds of futures are being privileged within school contexts. Building off an initial understanding of how students are engaging educationally with the future, I also examine how students think about the role that they play in future possibility as it relates to present agency; how do students view their own potential to change present circumstances and address contemporary issues? And central to this chapter, how can SF help open up conceptions of the future?

Individual, Absent, and Terrifying Futures

Understanding how students think about the future, and what factors contribute to the formation of the figured worlds and futures through which students act and interpret meaning, was an integral first step before exploring the potential of speculative narratives and world building to

make space for increasingly expansive future imaginaries. To establish this baseline, prior to the beginning of the study fourteen students completed a pre-study written response that asked them to reflect on future preparation and responsibility, how they form opinions about the future, and individual and collective orientations towards the future.

Responses to the first question, asking how students were preparing for the future and gauged their own responsibility *for* the future, varied widely. While some students described actions they were taking towards personal preparation (i.e. attending school, working towards a career/post-secondary), others also spoke more broadly about their future-preparedness in the context of responsibility, citing efforts to impact the future in positive ways through things like petition signing and sharing. Prior to the study, many students were already beginning to think about the ways their present actions impact others broadly, in spite of the fact that most students spoke about their individual futures before they reflected on community- or global-level future possibility. However, students' views on the impact of individual actions as catalysts for change differed widely, with one student admitting that they felt that "as an individual [they couldn't] do much to help" when it comes to larger issues like climate change. Answers to this question signaled an ongoing point of reflection for students: Do young people feel they can change the trajectory of the present as it extends into the future? How do they navigate individual future planning alongside considerations of the broader future impacts of personal action? Or, as another student answered, are they resigned to simply "take [the future] as it comes"?

Students similarly responded in different ways when asked what influences their opinions of the future, with some focusing on specific influences (i.e. family) on future perspectives as it pertains to individual goals, while others considered how their conception of the future is influenced by the media, societal observations, and reflections on the past as it relates the present.

Significantly, most students either focused on individual futures and how their interpersonal relationships with family and friends form their future-related opinions, or how the media (broadly conceived) influences them by helping them to navigate societal issues or, as one student responded, to give them a sense of "civilization and where it might be headed." Only two students cited school as an influence, with one only passively mentioning school in a list of other broad influences.

The final question asked students to reflect on how they think about the future at individual and societal levels. Answers to this question again signaled an individual orientation towards the future, with seven students reflecting on career aspirations and educational trajectories, epitomized by the following response: "When I think about the future I think more about my own future rather than on the future of society. I think about what I will end up doing and if what I end up doing is what genuinely makes me happy." Students who said that they often think about the future of society spoke about fears pertaining to the future: "I don't think about my individual future. As for the future of society, I worry about the future of humanity because at the rate we are going, we are going to destroy everything before we have the chance to grow old." These fears mostly touched upon environmental concerns, although one student noted fears about increasing violence in his community, which he linked to the likelihood of war in the future: "[I think about] the future of society - probably war, because mosques are getting shot up and people are dying." However, some students stated they equally considered both their own future and collective futures, mostly centered around technological change and possibility in the context of their own lives and potential change over the course of their lifetime.

While the pre-study written responses provided a sense of how students thought about the future and focused largely on individual preparation linked to traditional markers of success such

as grades and post-secondary preparation, students' answers hinted at fears about the future, and the inadequate ways schooling prepares them for the future beyond individual success. Students largely drew not from school, but from media and interpersonal relationships to form opinions about the future, particularly at a community or global level. The first of three interviews in the study provided students with an opportunity to expand on their answers to the written questionnaire. Although the questionnaire responses focused largely on individual futures, in the semi-structured group interview setting, students thought more expansively about the future, reflecting on the hopes and fears they hold, and their sense of agency and how they think about their role in changing the trajectory of the present towards or away from various possible futures.

Framing Thoughts on the Future

Responses during the first interview fell into two broad categories: factors influencing feelings about the future and overarching emotional responses to the trajectory of future possibility. Both responses are connected through students' sense of agency, and how they conceptualize change catalyzed by how school frames the future and how they enact change in their own lives. Perhaps unsurprisingly, when asked how the future is approached in school, students were largely critical, as illustrated in the exchange below:

> **Ivy B.:** I would say the problem with school is that we don't talk about the future at all. It doesn't engage you to care about the future. It just kind of... gives you things to do. That's all. But I feel like if it was like they said [motioning to Young, who criticized desk learning in favour of hands-on approaches], if it was more engaging and if people...Like, naturally we enjoy learning. Like when you learn something that you like to do, you're going to like it normally. And the problem is school kind of changes that. It kind of makes you not want to learn, because usually what you're learning is not something that generally you would want to know about. So it kind of burns out that spark that you have.
> **Zad W.:** Oh, yeah, totally. The way that school works just burns the passion for learning out of everyone. Like, people want to learn outside. [...] I mean, there's better ways to learn things than how we do it in traditional schools […] I totally agree with [Ivy]. We don't talk about the future. We just kind of use like outdated resources constantly because...no, no one gives schools budgets anyways. [Takes on a sarcastic tone here, and

does the 'peace sign' with their hand]

The excerpt above, while peppered with broad critiques of school, also emphasizes students' direct concerns about the way orientations towards the future are implicated by strict adherence to traditional modes of learning that push many students out of school. As Ivy[2] notes above, little attention is paid to the future in school, and school tasks are viewed as just "things to do" that "burns out that spark," or the desire to learn. This is further implicated by what students see as a lack of resources and dynamic learning practices, although Zad speculates how learning might differ across mainstream and alternative school settings. Picking up this theme later in the interview, another student, Kai, offers a different view:

> I think it will be interesting to see how more youth are going to act in the future, especially because like in the past, kind of going back to the first question, talking about education and stuff. It used to be a lot more like...on paper and stuff. It's not like it hasn't changed at all. And like, I feel like it was like a group way of thinking, where it was like, you can only think like one thing. It would be like, "okay, you have to choose one career, and go with that" or "you choose one thing, study that." But I think it's interesting to see the more diverse education now […] people are trying to educate themselves more on a little bit of everything.

Reconciling the assertion that schools remain unchanged with Kai's view that there are increasing opportunities to learn in multidirectional ways across and through often siloed subjects, there is a sense that not all school-based experiences are without potential. But ultimately, when asked if school has prepared students for the future, the resounding answer was no. As Zad argued, "so many people leave high school, with absolutely zero knowledge of what to do." As signaled above, for most students, school provides little direction regarding the future, especially for students who do not excel through traditional schooling structures, siloed subjects, and desk learning. Echoing the initial written responses, in the interview students instead referenced a broad range of sources

[2] All participant names are self-selected pseudonyms.

they use to frame their thinking around the future: friends and family, content they find on the internet, popular SF, news media, and documentaries were all directly referenced. A response by a student named Young garnered many enthusiastic nods throughout the group when he said, "I feel like a lot of kids like our age learn a lot more about the day-to-day world just by going out and being with their friends than they do in school."

Hopes and Fears

Student responses suggest that youth are drawing from myriad sources to develop a future-oriented figured world, or a figured future, and curate a sense of what kinds of futures might be possible. Significantly, these students also do not view school as a supportive space in which they can consolidate, work through, and navigate the various ways the concept of the future is thought about in the "day-to-day world." Unsurprisingly, then, their interview responses suggest that their hopes and fears regarding the future are interwoven in complex ways, as they piece together widely varying sources which inform their futures-oriented thinking, without a central means of support to process their thoughts.

Illustrative of these challenges, when asked what they were excited about with regards to the future, the conversation began with an onslaught of exclamations: *Flying cars! Virtual reality! Trips to Mars!* However, when asked to expand on this excitement, students responded in ways that illustrated conflicting emotions. Young's comment is representative of this:

> **Young R.:** Honestly, I'm excited [for the future]. And at the same time, I'm scared to see how just people in general, like...evolve and create new things, and to see what the future really does hold. At the same time, I'm scared because there are a lot of people who recently have been dropping out because a lot of kids our age don't like sitting in the classroom all day. So there's a lot of kids that don't have that general school knowledge to go and figure it out.

This theme of school excluding many students who might as a result be barred from being able to 'figure out' future problems persisted throughout students' responses. In a period of silence

following Young's comment, the participating teacher spoke about the hope she has for the future because of her work with youth:

> **Teacher:** I'm really excited to see what your entire generation does for the future, because I think your generation is extremely innovative and creative. And also open minded in a way. And I know this happens with every generation. But I think your generation specifically is open minded in a way that is very different from the generation before, which is mine. And I think it's more widespread. So, I'm excited to see what impact your generation has on the future, because you are the future.
> **Alex B.:** But I don't know if we're gunna make it to the future.

As Alex's comment above suggests, future-oriented uncertainty often poses a barrier to hope. Despite initial excitement about technological innovation and increased opportunities for new experiences, students' fears made them hesitant to fully describe what made them hopeful. When asked to expand on Alex's comment, which received supportive nods from others, students could more easily discuss the causes of their fears and what concerns they have. Amidst whispers over Alex's contribution, Zad and Young offered their perspectives on the root of their fears, and their feelings about the urgency of addressing climate change in particular:

> **Zad W.:** Global warming, climate change...like, just constantly hearing about it. And also like the constant extinction of species.
> **Young R.:** I kinda want to see how the next generations deal with it. Because like, we've already started but there's so much more that can be done. That can change what we've done, to actually fix it...to bring the world back to what it should be...
> **Zad W.:** ...I'm just hoping there is a future generation for that to happen.

As the above exchange suggests, this idea of 'running out of time' was also prevalent in conversations about hopes and fears for the future. Many students expressed belief that positive change was possible, but the uncertainty of existential continuance stood in the way of committed optimism. Despite these fears, however, they could still reflect on improvements in contemporary society within recent history, with Zad considering both the enormity of technological innovation over the last decade and increased representation in the media of folks inhabiting different identities. Specifically referencing LGBTQ+ representation, Zad reflected on how it makes them

feel more hopeful to see queer characters in entertainment and in influential positions within society. However, when asked how this observation impacts how hopeful they felt for the future, Zad reverted to a tentative non-answer: “It’s just things getting...better. Like hell, like everything else is kind of messy right now. But there's still good in the world...I think?” For these students, hopes and fears are inextricably linked, and are difficult to discuss in isolation. As indicated by the way students readily built off one another’s fears in contrast with prolonged periods of silence following comments around hopes for the future beyond the aforementioned exclamations (*Flying cars! Virtual reality! Trips to Mars!*), students had an easier time articulating fears as opposed to hopes they hold for the future, with hope tentatively grasped at as they reflected on the present.

Agency

Having asked students about the role of school in constructing their views on the future, their hopes, and their fears or concerns, the remainder of the interview focused on students’ sense of agency; how do they think about change, and their role in enacting change in the present towards different kinds of futures? One student described how they often sign online petitions that address issues that do not affect them personally, although they questioned the actual impact that this has on change. Another topic students debated was the benefit of sharing videos and links to news articles about important issues, and students were unsure if this constituted ‘action’ towards change as well. The question of how effective students’ efforts are in impacting issues they view as important continued throughout this part of the interview, as illustrated in the following interaction:

> **Ivy B.:** The thing is, a lot of things...there's not much, especially someone like me can do, cause I am not at a point where I am able to interact and influence a larger problem. The only thing I can really do is partially influence maybe local things-
> **Cyrus K.:** -Yeah. That's still change though… Like with climate change and everything. I live in [a neighbourhood along the shore of Lake Ontario], so there's a lot of trash everywhere. So me and a couple other kids, who also go here [to this school] and live

> [there] were like yeah, we should get like a bunch of people together our age and just go to the beach and pick up the trash. And even if it's like a small thing, it's still better than nothing.

Students continually balanced feelings of helplessness with their perceived need to respond to pressing issues, and the group was divided as shown above; while some students felt any kind of action towards change was important, others felt barriers to large-scale, meaningful change were insurmountable. Ivy expands on this issue, speaking to corporate dominance as one of the primary challenges:

> I think part of the reason why a lot of people think they can't change anything is because to some degree it's not their fault. Like, it's just generally not the public's fault for a lot of problems like global warming or plastic in the oceans. It's mostly companies that just refuse to change.

Many students' responses echoed this sentiment that, in many ways, youth feel helpless because of the scale of the problem and their view that local and individual change is an inadequate counter to corporate and systemic damage. However, near the end of the interview Zad attempted to consolidate some of these reflections:

> I think a lot of people are kind of misguided with what to do about climate change because a lot of like...the plastic sea is made up from one hundred corporations. They're just fucking things up for everyone, and then people are blaming other people for using plastic straws [....] I think there's just better ways to approach the whole plastic sea, climate change, all these issues…without just screaming at other people to do better. I think that positivity is like the better way to go about making changes rather than just scaring people constantly about things. Because I don't think about the future because I'm afraid.

Many of the students held conflicting views not only about their hopes and fears regarding the future, but also about their capacity to enact change in the present that would lead towards different potential outcomes. But as the above statement suggests, students like Zad had also begun to think about what effective change might look like, desiring positivity and collective action against the backdrop of interpersonal blame and personal fears preventing students from thinking about the future at all. Given this assertion that Zad does not "think about the future because [they are]

afraid," the SF unit described in the next section sought to help students engage with and think about the future in different ways. Significantly, this unit was created to position the future *as* mutable; as the sheer scope and plurality of imagined futures within the genre suggests, the future *can* be more than a simple continuation of the present as it is.

Science Fiction: Exploring Genre

The imaginative potential of SF to catalyze new ways of thinking about the future was the primary focus of the SF unit, which positioned the worlds of SF works across media as playgrounds within which students could think about present change and future possibility. As such, students engaged with a range of SF texts, both through an inventory of self-selected media including novels, short stories, TV shows, movies, video games, and graphic novels, and through a model of collective engagement with specific works. To establish a foundational understanding of various elements of science fictional storytelling, the class read aloud "The People of Sand and Slag" over the course of three days together, with discussion and collaborative exploration interwoven throughout. In anticipation for the second part of the study where students would be adapting approaches to world building to imagine the future of Toronto, attention was paid in the first unit to unique aspects of SF, including extrapolative storytelling models and the identification of novums, or central 'new' phenomena, and elements of world building in texts, including setting, significant issues, societal structures, and culture. Particularly with the texts we collaboratively explored, discussion also focused on how various fictional worlds were affectively designed to make the viewer/reader feel a particular way about both their present and the future possibility represented.

Pedagogies of Listening

Given the positioning of SF as an entry point into speculative future imagining, initial collaborative experiences with SF texts were central to the formation of students' capacity to think through how speculative worlds are constructed, and how they might engage with such storytelling practices together when applied to real-world contexts. The participating teacher and I therefore adopted a foundational approach to teaching these texts described by Low, Brushwood Rose, and Salvio (2017) in *Community-based Media Pedagogies: Relational Practices of Listening in the Commons* as a pedagogy of listening. A pedagogy of listening is one which views listening as intersubjective, where listening is "a relational project" that emphasizes the "interdependency of teller and listener," characterizing listening "as a form of collaboration, a mediation of self and other" (p. 4). We sought to build a "[...] pedagogical [space] that [understood] storytelling as a community-driven and relational practice" (p. 10), with students' co-construction of knowledge at the heart of their engagement with texts. Time and space were provided for students to listen to each other's interpretations and complex emotional responses to stories throughout their exploration. Low et al.'s exploration of listening practices in community-based educational spaces in relation to storytelling offers ideas that are also illuminating in mainstream educational spaces, provided engagement with stories is facilitated as a collective practice of listening in the classroom. In the following sections I offer a summary of students' engagement with Paolo Bacigalupi's short story "The People of Sand and Slag" (2004) as one example of this kind of exploration of genre, and I signal the ways that individual and collective reading contributed to an expansion of students' figured futures and served as a catalyst for reflections on the present.

Science Fictional Listening: The People of Sand and Slag

The textual example that students engaged with follows three heavily 'modded' security guards who work in the mining pits of a far-future Montana, and survive on eating sand. They investigate a security breach in the pits, only to find what is assumed to be the last biological dog, with acid burns on its feet and mud matting its shaggy fur. This story pushed students to imagine an unfamiliar and isolating future, requiring them to navigate new language, uncomfortable representations of post-human embodiment and, finally, the existential fragility of their own sense of humanity. Students were challenged to explore this story through a framework of the conflict and difficulty involved in listening both to each other, and to a hostile world.

Through the use of unfamiliar language, Bacigalupi decentres the contemporary reader immediately with technical jargon: words like 'TS-101,' 'slashbangs,' and 'Hentasa Mark V engines' tell readers that, as one student remarked, "this obviously isn't our world." The reader is dropped into the world mid-action, without a chance to orient themselves. Unable to identify with the characters resulting from linguistic barriers, Bacigalupi not only signals that this is not the world of the reader but that, as a human, the reader does not belong in the world of the story either. Students were frustrated by this, with one student stating, "for the first two pages, we don't even know what's going on!" We allowed students ample time to interpret the text collectively and to get a handle on the plot, but also to open space to consider why the author might mobilize such an isolating approach for the reader. While students pooled together an interpretation of the beginning of the story through previous experience with military jargon largely via military-themed gameplay, and navigated potential 'landing points' for the reader to orient themselves - the mention of zoos, the emergence of the dog, the way the main characters tease each other - one

student concluded this discussion with an important note about language: “It is to make us [the readers] realize just how different this world is from our own.”

Students’ experience listening to both each other and the ‘world’ of the text illustrated the following dynamic laid out by Low, Brushwood Rose, and Salvio:

> In this exploration of listening as dialogic relation, we see emerging two different perspectives: one in which the listener is listening for (a possibly self-interested) something in particular, and another in which the listener is listening for what she cannot anticipate, for what might emerge if she is able to set aside preconceived expectations [...] (2017, p. 22)

When students started reading Bacigalupi’s story, they were looking to see themselves in the text. The narrative resists this type of identification and, through listening for the unexpected and unfamiliar, students had to contend with the inherent *difference* presented in the story. Because, as students unpacked together, to be ‘human’ in Bacigalupi’s story bears little resemblance to what it means to be ‘human’ in contemporary contexts; characters break limbs with no concern, as they heal quickly through ‘weeviltech’ (Bacigalupi, 2004; 2019, p. 51), eat sand (p. 53), embed blades into their skin, and replace their body parts with new components for aesthetic effect (p. 54). Students attempted to find equivalent contemporary practices to make sense of the text, but efforts to normalize the story were shot down in the process of discussion. As one student exclaimed, “Yeah, we get lip injections and boob jobs. But we can’t rip out our spines and put new ones in because it’s prettier.” Every embodied difference in the text was met with shock and created opportunities for students to experience being ‘grossed out’ together. But none prompted such shock as an intimate scene near the end of the story:

> She was beautiful, lying there on the beach, slick and excited with all of our play in the water. I licked opals off her skin as I sliced off her limbs, leaving her more dependent than a baby. Jaak played his harmonica and watched the Sun set, and watched as I rendered Lisa down to her core. (p. 65)

In this scene, a character finds pleasure in being made helpless through having her limbs cut off, and it is in this visceral kind of content that students realized just how not-human these humans are. In response to the notion that in an era of technological immortality, profound helplessness can become a pleasurable novelty, one student noted: "In this story, we aren't the human characters. We're the dog."

This realization brought into focus another aspect of collective listening as a kind of pedagogical orientation to speculative worlds, as "intersubjective listening opens thinking up to difficult emotional meanings" (Low et al., 2017, p. 117). When the characters find the dog, they can only speculate as to what the dog is. As many students lamented, this was obviously a world without pets or close connections to other biological beings of any kind, and the world Bacigalupi envisions is no longer a place for a creature like the dog. The characters struggle to find food for the dog, hurt it by accident due to its fragility, and are continually inconvenienced by its mortal nature. Throughout the story the focalized character, Chen, is continually surprised by moments of closeness with the dog, having it jump up on his bed to sleep with him. But even though the characters resolve to keep the dog, the world is too hostile and dangerous a place to care for it; after getting tangled up in barbed wire on the beach, the group decides to eat it. The story ends:

> Without the dog, we could really enjoy the beach. We didn't have to worry about whether it was going to step in acid, or tangle in barbwire half-buried in the sand, or eat something that would keep it up vomiting half the night. Still, I remember when the dog licked my

> face and hauled its shaggy bulk onto my bed, and I remember its warm breathing beside me, and sometimes, I miss it. (Bacigalupi, 2004; 2019, p. 67)

Students collectively witnessed this loss but, through previous discussions equating the dog in the story to themselves as 'fragile mortal beings,' students also grappled with the feeling of losing themselves. This ending elicited strong emotion, and students had to listen to and support each other as they struggled with what one student thoughtfully described as an "overwhelming sense of nostalgia for organic life" and a potential loss of "our way of being in the world."

Through sustained collective listening both to each other and to the world Bacigalupi constructs in "The People of Sand and Slag," students navigated the prospect of difference together, and ultimately reinforced their sense of connection with biological life beyond anthropocentric models through their identification with the dog in the story. Through the brief example provided here I make a case for embracing pedagogies of listening as a way into constructed worlds. However, students' 'listening' through genre was also multifaceted in this part of the study; as we engaged with texts collectively throughout the unit, students also self-selected three SF texts to concurrently explore on their own. Selected from an 'inventory' of texts (Appendix G), students' selections ranged from young adult SF like Scott Westerfeld's (2005) *Uglies* and adult-marketed space operas like Becky Chambers' *The Long Way to a Small Angry Planet* (2014), the games *Portal* (2007) and *Portal 2* (2011), illustrated texts like Jonny Sun's (2017) *Everyone's a Aliebn When Ur a Aliebn Too*, and short stories from *Love Beyond Body, Space and Time: an Indigenous LGBT Sci-fi Anthology* (2019), in addition to various movies and television series. By engaging with different imagined futures both independently and collectively, students could explore a range of constructed worlds, and share those explorations with one another as they thought differently about SF as a genre, and possibilities for how SF can help them

critically navigate present change and future possibility. As illustrated here and explored throughout the study, if speculative storytelling offers us a means of understanding ourselves, grappling with contemporary issues, and imagining future possibility, then, through careful listening in community with others, we can also understand the scope of our responsibility to either collectively work towards or derail potential futures envisioned in narrative.

Understanding Students' Science Fictional Exploration

Importantly, throughout this process of engaging with genre, students' perspectives on what SF is and how it functions as a way of thinking about the world expanded. While many students were personally familiar with SF, many students still thought about SF largely through its common tropes. SF and dystopia were also largely interchangeable for students, with the genre typically representing the worst possible outcomes for society. However, through sustained engagement with different texts across a broader range of stories, students began to develop a more nuanced understanding of how stories influence societal shifts, and the significance of broadening the kinds of stories we tell about the future. Following the SF unit, students had an opportunity to expand on what they learned through the completion of their SF inventories and in-class experiences with SF in the second interview of the study, through which I sought to better understand how students viewed the role of SF in future imagining, the impact these narratives have on present perspectives and change, and to begin unpacking how students might envision using SF storytelling and world building to imagine the future of Toronto.

Throughout the unit, as represented in the interview, students formed more critical opinions about the genre, particularly regarding the utopia/dystopia binary. In particular, they observed that the most popular SF texts are often dystopian and criticized the way that mainstream media similarly perpetuates visualizations of society falling apart without offering alternatives. When

asked why students thought both dystopian narrative and rhetoric had become so popular, students offered a few key reasons, including that dystopia generates conflict around which a narrative can be built. Students also questioned whether it might be easier to "imagine the bad things that happen," and suggested that dystopian-leaning stories are not only easier to build a plot around but, additionally, that in contrast utopias are polarizing; what a 'perfect' society might look like will necessarily not be perfect for everyone. But, as Jeffree exclaimed within this interview, many students also felt like dystopia was more relatable because, perhaps, "we're already in a dystopia." When asked about the impact of dystopian narratives on their future-oriented thinking, students were therefore torn on its benefits and the challenges of living in a dystopian-dominated climate:

> **Zad W.:** [...] the more you think about how garbage the future is going to be, the more that's going to influence the work that you do. Right?
> **Teacher:** [clarifying as the student trails off] Well, no, but there's this idea that the way that we think about...about what the world will likely look like sort of influences how we act in the present and the things that we can create. And so if we're always thinking about dystopian futures, then we might in turn be feeding into that even more. And so we just become more and more dystopian as a result. Is that what you meant...?
> **Zad W.**: Yeah, yeah.
> […]
> **Jeffree F.:** But what if it does the reverse effect, and kind of scares us off from doing that? […] It's kind of like a warning sign. I mean, like, nobody wants to live in a shitty environment. So, I feel like it does help somehow. Like, it's just more like, "wow, this might be a thing." And then it makes you ponder on how to solve that.
> **Ivy B.:** I was just gonna say that it depends on how you perceive it because it could make you think, "Huh, what if we could stop this before it happens?" Right? But it could also make you think that, "oh, this is already happening. It's too late." You feel it kind of makes you feel almost hopeless to some degree. It depends on the context of the story and how far it is from now.

Students began thinking not just about the content of stories, but also how stories function as a catalyst of worldview formation, and how certain narrative arcs and themes contribute to a sense of what is possible, inevitable, avoidable, and desired. However, Maeve stressed the importance of having "[...] a realistic view, because there will always be positive and negative [in society], but

it's just about how to look. I think, I don't know, people try to always just take out all the negative, but it's...there's not going to be a perfect land. It's just never going to be perfect." As illustrated in Maeve's contribution, many students critiqued utopian perfection as the focus of societal change. Relatedly, what Maeve went on to suggest is that SF, when moving away from purely dystopian or utopian structures, can help us approach societal change through a more balanced approach wherein we can see both positive and negative change before us. This thread continued throughout the interview, with students expressing frustration at the totalizing power of dystopia, particularly in young adult SF. Students expressed feeling exhausted by stories that did not offer a range of possibilities beyond the black and white dichotomy of calamity and perfection. Building upon these frustrations, within the interview students increasingly moved towards thinking through specific contemporary issues that mattered to them in a more multidirectional way, applying science fictional thinking towards imagined possibility in their own lives.

Mobilizing Narrative to Build an Image of the World

The final week of the SF unit focused on world building, during which students analyzed SF texts through both story and construction, examining how fictional worlds are built in anticipation for building and writing within their own imagined future of Toronto. Subsequently, in the final question of the second interview, students were asked to reflect directly on how their experiences with SF influence how they anticipate approaching the world building project, and the opportunities and challenges they imagine facing as they collaboratively imagine a future Toronto together. As students reflected on SF and its narrative function, they began to consider how stories can put forward solutions to societal problems, and how speculative texts allow a means of sharing storied futures with others. Through this, students began viewing the upcoming world building project as an opportunity to ask questions, imagine possible solutions to contemporary problems

in ways that are more interesting to them than an essay or other informational forms of communication, and share possible interpretations with others. While students identified challenges they anticipated during the collaborative world building process - disagreements and working together, imagining a time beyond prevalent politicians they viewed to be unethical, and navigating misinformation when gathering research material for their wiki pages - students were eager to discuss the opportunity of being able to tell their own stories about a future in flux. It is this storytelling experience that the next chapter will explore, ending with a consolidation of findings from and analysis of both students' science fictional explorations detailed in this chapter, and their world building experiences.

Chapter Six: Toronto 2049

I found it meaningful to collaborate with others to imagine the future of Toronto because it isn't just my future; it is all of ours.

Alyssa M., student participant

The city builds up instead of out, with tall multi-use buildings covered in solar paint and virtual reality technology embedded in apartment windows. Toronto has become a haven for climate refugees and, amidst a sharp rise in automation and a shift in economic structures and resource distribution, society is currently in the process of reconceptualizing what constitutes 'meaningful' work. A child drops her school-sanctioned headset on the kitchen counter and asks her father what school was like when he was her age. A post-secondary student enrolled in a human relations course falls in love with a robot peer. A fashion designer uses a partially flooded Front Street as a runway to showcase a size-inclusive line of biodegradable clothing. Elsewhere in the city, art and handmade goods are traded in an emergent bartering system, a community governance board collaborates with youth representatives, and a line of patients wait to receive vaccines and routine check-ups from artificially intelligent nurses. Isolated in a rare community of large houses just outside the city limits, a teenager wonders if she will ever meet her friends from school in 'real life,' children play on bio-turf atop a large building installed as part of the city's 're-greening' efforts, and a self-proclaimed 'sci-fi fanatic' puts on his haptic suit to watch the 2029 cult classic *Avatar 7*.

Overview

The description opening this chapter provides a glimpse into the world of Toronto in 2049, the object of collaborative speculation as part of a world building project conducted in 2019 with the secondary English class described in the previous chapter. In this chapter I will discuss the collaborative storytelling process facilitated through the world building project, as

well as both a broad structural overview of students' imagined Toronto and specific examples that illustrate the dynamic ways that students connected with each other's ideas, and detail the tensions and opportunities posed by speculative, collective imagining. I will explore students' collaborative storywork through the third research question framing this stage of the study: *How can science fictional world building facilitate students' engagement in democratic, collaborative decision making about the future without foreclosing on the concept of uncertainty, and open space to explore a plurality of perspectives and possibilities?* Returning to the concept of figured worlds, I will also consider how speculative storytelling and science fictional world building can help students reshape the figured worlds, and figured futures, through which they relate to the future, while making space for students to inhabit decision-making identities wherein they can explore the future beyond institutionally-defined notions of what is possible.

Figured Futures: Identity, Agency, and Improvisational Play

The world building portion of this study began on the top floor of an old, multi-level school building, in a large classroom with tables pushed towards the centre of the room, with SF books from the study strewn about the room and lining the walls. The participants were students in a split-grade, secondary English class, in an urban alternative school designed to serve students who had left the regular school system for myriad reasons: homelessness and housing precarity, mental health challenges, bullying, incarceration, family crises, and other challenges. Many students attended school infrequently—often balancing healthcare, family care, and employment. For many, consistent attendance regardless of credit accumulation was a celebrated accomplishment. Given the context, the participating teacher and I feared that the world building project would be too temporally demanding for our students, and that the responsibility of collective storytelling

would prove too inflexible for students to access amidst the turbulence of their daily lives. However, on the day the first collaboration meeting was scheduled to lay the foundation for the fictional future the class would imagine and build together, two long tables surrounded by chairs necessarily became four, and students who arrived late had to pull in extra seating.

While this was not a study about alternative schools, I begin with this context to emphasize these students' profound yearning for conversations about the future, and their desire to have their voices heard, even – and perhaps especially – amidst circumstances which often kept them from school. Whatever concerns the participating teacher and I had regarding the demand this project might have placed on students, this eager response is consistent with research on the literacy experiences of marginalized youth whose authentic perspectives are seldom represented in schools and in young adult literature in general, but who nevertheless desire to creatively engage with their own literary representation (Marshall & Rogers, 2017). Further, throughout our first collaboration meeting and across discussions and interviews, students consistently sought not to explore a future that is a problematic reiteration of the present, but to envision something different and hopeful in its imagined possibility. In part, this process also allowed students to build new identities and positions, as individuals who could work towards change – an important opportunity for students who so often feel abandoned by society, as exemplified by student conversations about their peers 'falling through the cracks'. In Holland et al.'s (1998) *Identity and Agency in Cultural Worlds*, identities are socially constructed through figured worlds, with figured worlds being "a key means through which people care about and care for what is going on around them" and "are important bases from which people create new activities, new worlds, and new ways of being" (Holland, Lachiotte Jr., Skinner & Cain, 1998, p. 5). While figured worlds are constructed around norms, Holland et al. take a dynamic approach to the relationship between identity and figured world

formation through the concept of *improvisation*; the ways in which individuals draw from past experiences and present contexts to socially construct new ways of knowing and being in the world. As Holland et al. assert, improvisation "can become the basis for reformed subjectivity" (1998, p. 18), a process characterized by agency. Fundamentally, this work conceives of stories as important tools in improvisational agency, through which we can consider: "How do people together create new cultural worlds? How do their subjectivities expand or reform so that they are able to inhabit new worlds?" (Holland et al., 1998, p. 8) While in an ethnographic context figured worlds are systems of sociocultural signification whereby individuals act within and understand the world around them (Holland et al., 1998, p. 52), the concept of figured worlds is here used as a narrative frame through which certain actions, subjectivities, and realities are *made possible*. When students are given the task of reimagining the 'world' of the future, they are tasked with taking on the subject positions of decision makers who draw on their own experiences and perspectives to resignify and reshape what *might be*. In this sense, then, figured worlds can be used as a frame for both the problem that this study addresses and as a way of addressing the emptiness of the future in schools, through both engagement with new stories about the future in the previous chapter, and the building of new future-oriented storyworlds in this chapter.

The construction of 'figured worlds' is cultural, social and, significantly, often determined through institutional structures of power and characterized *by* relations of power (Holland et al., 1998, pp. 57-58). Institutions such as schools mobilize curricula, policies, and various other mechanisms of control to construct the figured worlds within which students learn and develop a sense of self. Importantly, schools also determine what futures students are allowed to anticipatorily act within and work towards, characterized by standardized assessments, post-secondary educational aspirations, and job attainment. In contrast, the speculative narrative

explorations and world building work that this study employed were designed to give students the power to construct *new* figured worlds, or figured futures, through which they can imagine, play, and act within and towards instead. The curricular intervention detailed in this chapter was designed as an open, student-driven task which constitutes what Holland et al. term 'play' within a "cultural production of virtualities, that allows for the emergence of new figured worlds that come eventually to reshape selves and lives" (1998, p. 236). Drawing from the ways in which "imaginary worlds can inspire new actions" (Holland et al., 1998, p. 49), this chapter will explore how students constructed and then conceptually inhabited the figured future they imagined in myriad ways, and how these processes link to students' sense of agency in the present, positioned in contrast with the ways the figured world of the future is often narrowly constructed.

World Building

World building, sometimes termed worldbuilding (Hergenrader, 2019; Loper, 2017) or world-building (Tuttle, 2005), worlding (Haraway, 2016), or world-making (Truman, 2019), is, in general terms, "the act of creating a fictional world" (Hergenrader, 2019, p. 9), although the focus and scope of world construction efforts and theorization differs across terms and usages. In this research, world building was conceptualized pedagogically through the following question: how do SF storytellers (writers, directors, designers) build their science fictional worlds? To explore this question together, students were guided through processes of both reading *through* world building, by analyzing and deconstructing texts and textual worlds to see 'behind the curtain' of plot and dominant thematization, and writing *within* the frame of world building by applying what they learned in their collective and independent reading practices to craft their own fictional 'world' or future. The SF unit and world building project were linked by the view that through understanding the various ways SF authors and creators build fictional worlds, students could then

similarly experiment with world building, and begin to form expansive views on how different parts of a society, a future, and a world are all interconnected through creative world construction.

The world building resources designed for this unit presented simplified elements of fictional worlds and stories, such as temporal setting and social norms, through which students reflected on the texts they read. They also engaged collectively with narratives through the lenses of specific *aspects* of the world building process, including plot and novum development, setting, culture and community, and style and affect.

One of the central parts of these lessons involved working with students to examine the interconnected nature of aspects of society, and how events seldom occur in isolation. In her *Writing Fantasy and Science Fiction* (2005), Lisa Tuttle reminds the reader that in world building, "[...] events have consequences. Even in an imaginary world, actions ripple out and have an impact on everything else. When you're world-building, you need to consider the whole ecology, not just isolated details" (pp. 38-39). Anticipating the world building project which marked the final month of this study, students were continually asked to reflect on the complex and interwoven nature of worlds - both imagined worlds, and their own contemporary context - and navigate the inevitably incomplete nature of world building. Viewing world building as an ongoing and incomplete process was important, especially within a collaborative world building project where students' ideas on what the future of Toronto might look like could morph into unforeseen possibilities.

Collaborative Storytelling and Building a Future World: Toronto 2049

In the rest of this chapter I will describe the process that students went through when engaging in the world building project, the content of the future of Toronto they imagined, students' perspectives on the process and its impact on their feelings about the future and, finally, pedagogical insights from this work and a movement towards forming a speculative pedagogy.

The world building project was designed not only to facilitate students' future-oriented storytelling, but also to explore how telling stories collaboratively about the future impacts students' sense of community and agency in the present, alongside their orientation towards futures that are inherently uncertain in turbulent times characterized by climate change, radicalized politics, and increasing economic and justice-related disparity. Expanding on students' engagement with SF and the future described in the previous chapter, if students' dispositions towards the future affects their sense of agency in the present, the world building project was also designed to explore specific questions related to storytelling: in a time where it seems to be increasingly difficult to communicate across ideological worldviews and where societal issues like climate change seem insurmountable, how can collaborative storytelling help make space for hope, even in the face of uncertainty? How can this kind of storywork facilitate the development of new figured worlds and figured *futures* through which new possibilities can be imagined and realized? And finally, how does doing this work, when done in community with others, allow for a plurality of potential narratives to emerge and coexist?

Process

Using collaborative, speculative world building as the starting point, Trent Hergenrader's (2019) description of world building is helpful in describing the structure of the Toronto 2049 project:

> *Collaborative worldbuilding* is when more than one person works on a collaborative worldbuilding *project* for a specific *audience* and in a recognizable *genre* of speculative fiction. […] The goal of a collaborative worldbuilding project is to create a world that is convincingly *coherent*, which means each individual piece of the world must make logical sense in the context of the world's rules. It should also be *consistent*, meaning that all these

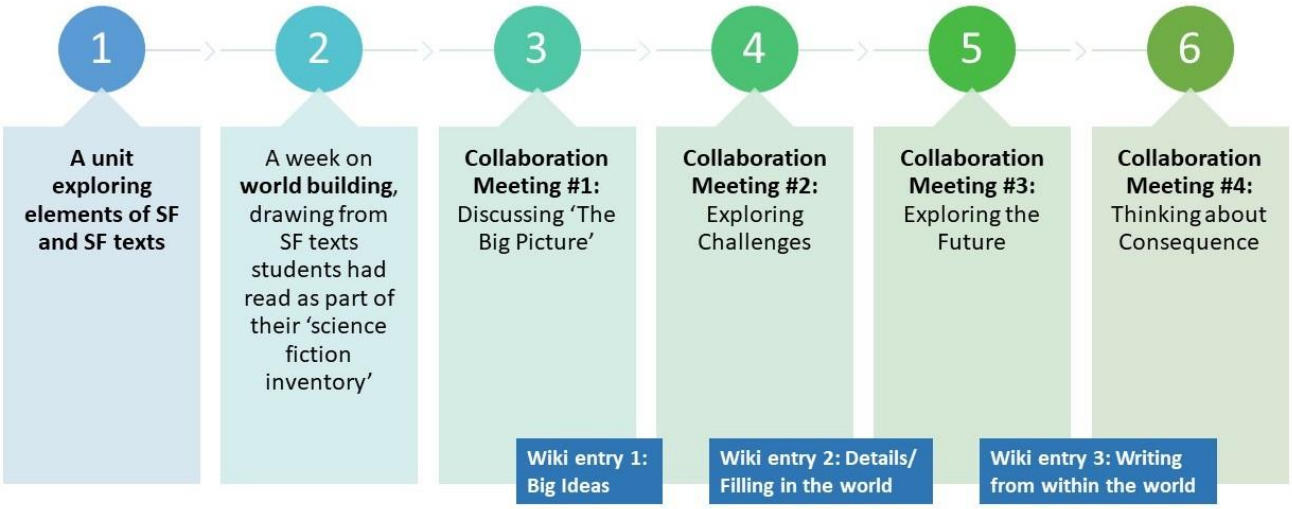
> pieces of the world are compatible with each other. Ensuring both coherence and consistency requires a significant amount of negotiation and compromise of differing, and sometimes competing, viewpoints of the contributors. (p. 10)

Following this approach, the world building project included in this study asked students to mobilize science fictional storytelling approaches together, and the focus was not only on the content of what students imagined the future of Toronto might look like but, importantly, on how they navigated disagreement to form a coherent world that could contain opportunity for difference within it.

The platform used to host the world building project was a self-contained wikimedia platform, which acted as a 'catalogue' for the imagined future of Toronto. Students were tasked with creating three wiki pages within the Toronto 2049 wiki, which were designed in between collaboration meetings during which students would make decisions about the future that they were collaboratively imagining.

Figure 6.1

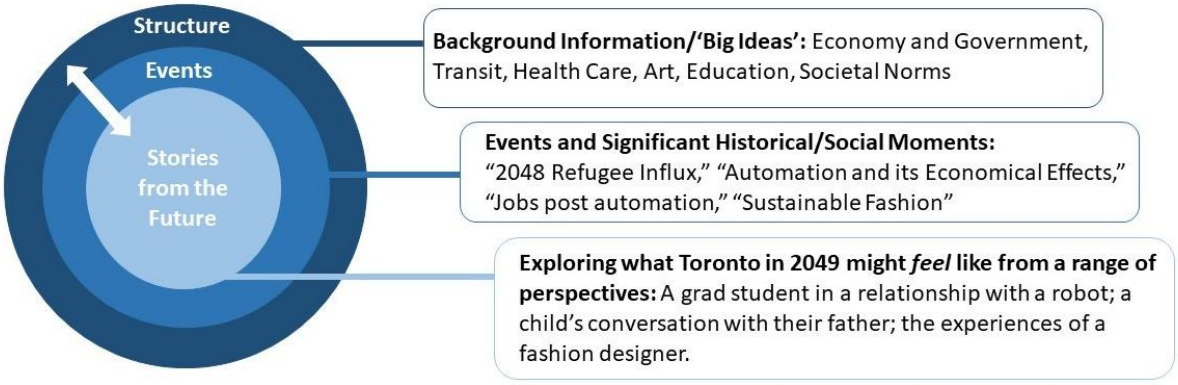
Stage One Study Structure



Four collaboration meetings were scheduled throughout the final month of the study, each with guiding questions to help facilitate students' collaborative world design (Appendix E). These meetings were supplemented with informal meetings in between on an as-needed basis determined by students. While the direction of the world building project was student-driven, the assessment and task completion structure was co-constructed by the participating teacher and I to ensure students were still meeting curricular expectations as required by the schoolboard, and involved each student completing one wiki entry for each of the three 'levels' of wiki contributions for the project. The image below illustrates the levels of wiki entry, and some examples of work that students did within the Toronto 2049 project.

Figure 6.2

Levels of Wiki Entries in the Toronto 2049 Project



The wiki entries moved from broad, first-tier entries ('big ideas'), to second-tier wiki entries designed to fill in the timeline between the present in which students wrote (Spring 2019) and the future they imagined (the year spanning 2049-2050), to third-tier contributions (using the created world to write from *within* the world from a first person perspective). The following sections detail the process through which the world, described briefly at the beginning of this chapter, formed

across multiple collaboration meetings, formal and informal class discussions, wiki entries, and independent exploration.

Collaboration Meeting #1: Discussing the 'Big Picture.' The first collaboration meeting was structured to provide students with an opportunity to establish the 'big picture' or key elements framing the world. The focus of this meeting involved negotiating the broader aspects of the project that would impact all wiki entries, including the temporal location of the project, the geographical limits within which students would be writing, and the major events between their present and the imagined future that would have the most significant impact on the project. Students' discussion about temporal and geographic location were largely pragmatic, although both conversations involved debate about what they wanted to write about and include in their world. Students thought seriously about the challenges associated with writing in both the near- and far-future, drawing from the sheer rate of change they have experienced, and what they hoped for the project. While participants had different preferences, spanning from 20 to 80 years in the future, the prospect of 'seeing' the outcome of predictions alongside the ease associated with a mid-sized jump into the future encouraged students to pick a date that was relatively far into the future, but not so far that it was extrapolatively unimaginable to them from the vantage point of the present. The geographic positioning of the project followed a similar trajectory, although the boundaries of what constituted 'Toronto' was hotly contested; students ultimately chose to follow the limits of the city's subway system.

Students also considered what major events or developments may have occurred between the present and 2049 to shape their explorations of the future, which led to the following imaginative possibilities:

1. Increased flooding and extreme weather as a result of climate change, thereby impacting resources, ways of life, and the influx of climate refugees (due to not meeting the 2030 UN 'deadline,' for which meeting notes (United Nations, 2019) had just been published and widely circulated based on a 2019 report from the Intergovernmental Panel on Climate Change);
2. A coalition of smaller, community-based political parties/representatives resulting from loss of faith in a single party/leader;
3. Mass technological innovation, approaching singularity (the point when intelligent technology can improve upon itself without the need for human intervention), making artificial intelligence, space exploration, and virtual reality more prominent.

Thinking beyond just Toronto, students also imagined that many places in the world would see increased immigration because of climate change, thereby impacting overpopulation, space, housing, transportation, and resource allocation within the city. Geographic changes, largely from flooding, would compound these issues and impact global land use, food production, and implications for nature and wildlife globally; all issues they would have to address in their imagined future Toronto.

This list of major events and worldwide impacts of change were the result of significant debate, as different students offered their views on what impact issues in the present might have on the future. Of the worst possible outcomes, students discussed the possibility of irrevocable damage from ongoing natural disasters and accompanying extreme food and water shortages, nuclear war, an invasion of Canada by the United States, and totalitarian government control and/or emergent police states. The initial conversation was predominantly dystopian, rooted largely in students' reported feelings about contemporary society and politics more broadly. They

also questioned the continued prevalence of politicians like Doug Ford and Donald Trump, both of whom all students in attendance at this meeting unanimously viewed as problematic and cited by name, and many students expressed distrust of all politicians when thinking about what the future might look like. Points like this served as pivotal moments within the collaboration meeting, when the group decided to envision potential solutions to contemporary issues versus narratively pursuing the most dystopian of imagined societal trajectories. For example, when thinking about government, students chose instead to imaginatively build a fractured governmental structure that would make space for more meaningful, local impacts, and increased involvement of youth in political change, instead of writing from within a future characterized by government control. As students moved through topics like the impact of climate change locally and globally, advancements in technology moving towards the singularity, and shifting populations and accompanying social structures and societal norms, the group began to increasingly navigate the liminal space between utopian and dystopian imaginaries. Given the inherent messiness of this kind of storytelling, the meeting ended not with a final determination about what the future would like, but a set of characteristics about the future through which they could continue to collaboratively explore what they imagined the future might hold.

Supplemental In-class Discussions. In the following two classes, students built upon these ideas, as they felt they needed a stronger foundation and more 'information' before doing independent research and developing the world. This process involved students deciding what 'big ideas' and areas of concern form a society and working through the challenge of establishing a broader foundation for their imaginative consideration based on the ideas shared at the first collaboration meeting. In the first of two discussions, the project notetaker, Jeffree, began by opening with how progress might occur in continuing to develop the project foundation:

> **Jeffree F.:** So basically, we discussed yesterday that it wouldn't be a good idea if we went into little groups and have like two little groups decide big things...one being, like, economy and one being like, I don't know, the lifestyle of a person, separately. Because then...when we all come together and somebody dislikes the opinion, it's just going to have to be an all out discussion from everybody. So we're going to kind of, all together make kind of decisions on what the base of this project is, and then go out to little groups to discuss like the little things. Then come back as one and discuss the ideas and then pick those ideas and then, you know, put that into the project and then go back and do the same thing until we have the full project.
> **Zad W.:** Yeah, going and deciding all together the base... so at least nobody doesn't like the biggest part of the project.

In these supplemental meetings, students were beginning to work through how to balance differing opinions and perspectives of all contributors, while still ensuring some internal consistency across the project. However, as illustrated above, students' approaches initially mirrored processes of consensus, through which a kind of perfect harmony of perspectives and ideas might be achieved for expeditious purposes. However, the goal of simple consensus was quickly upended by the topic of the economy, with students having differing opinions of what an economic system beyond capitalism might look like, and how much change is actually possible before 2049. While some students believed there would always be a gap between rich and poor, and others found the prospect of imagining complete economic collapse interesting to write about, the conversation ultimately turned towards other alternatives:

> **Ivy B.:** What I think a lot of...in science fiction...what I would think could happen is that automation is becoming more of a thing, right? Like computers and machines are able to work on stuff on their own. And obviously that causes a problem because people need money and jobs to live, right? But I always thought that maybe at some point no one would need money because the machines that people have built will be able to do the work for them. And if anything, managing them could just be like a passion thing, I guess. Like, some people are very passionate about that. It doesn't take much maintenance, especially if they're able to handle themselves so well.
> **Zad W.:** So moving into a bartering system of like...all of the materials that automation gives us rather than a money system?
> **Ivy B.:** Yeah. Kind of like everyone. I don't know, not really... It's definitely much more of a utopian thing where no one's like, you know, stressed or anything and automation just kind of does its own thing. But I feel like it is possible.

While the group ended up deciding to write from within a transitional period between what Ivy describes above and a continuation of capitalist economic structures within the present, the trajectory towards that economic foundation within the world had to bend to accommodate different imagined possibilities, and contributors' different perspectives of what might be preferred, probable, and possible within the narrative timeline.

The challenges associated with the decision-making process were additionally compounded by the interconnected nature of issues within the world, exemplified most prominently through conversations around the impacts of climate change. Having collectively decided that the climate change crisis would not effectively be addressed by 2030, students instead reflected on how a future society might adapt to a new reality:

> **Teacher:** OK, so climate change has not been solved. [Anica], you were shaking your head, too. You don't think it will be? [Anica shakes her head, but does not respond]
> **Jeffree F.:** I think you would...we would have technology that is not oil-based.
> **Ivy B.:** I mean, I think within the next five years, a lot of countries are putting in laws for all vehicles to start using electric motors.
> **Zad W.:** The carbon tax is already a thing.
> **Brittany:** So then climate change...we don't turn everything around in time to make the 2030 deadline, but things do get better?
> **Zad W.:** Yeah.
> **Ivy B.:** But also things like change...people...in preparation for that there definitely will be people developing tech to help us be protected from it. Say like, you know, heat resistant houses, stuff like that?
> **Zad W.:** Oh, that could be an interesting thing to develop in terms of, like, what clothing people have to wear for extreme weather. Everyone has to wear like...face masks.

As students began to discuss distinct issues, with climate change being the example above, they also began to make connections across different aspects of society; an unresolved climate change crisis that is only beginning to be addressed, for example, would necessitate architectural changes alongside possible protective gear in the form of face masks and other pragmatic fashion accessories to combat air pollution, or increasing temperatures. By making space for students to

begin building these connections as they work through their ideas together, this meeting - the first of two supplemental discussions - served not only to help students 'fill in' the world, but also to establish methods through which they might navigate disagreement, and also begin to process the complexity of building an interconnected and messy world of moving parts and issues as they moved forward in the planning process.

Moving into the second day of supplemental, student-lead discussion, Jeffree again provided an overview of the progress they had made to start off the meeting, including legal regulations that might change in response to a worsening climate context, decreased value in money, a 'splintered' governmental structure, and a society which will have to develop infrastructure to accommodate climate refugees. Based on this summary, Jeffree began the meeting with questions they had developed to help start the discussion process. By this point in the project students began running the meetings more independently, and the participating teacher and I stepped back as primary facilitators. A significant contributor to this meeting structure was establishing a student-appointed notetaker who kept track of group decisions and remaining questions for future meetings.

During this meeting, students drew from their personal experiences as they went into more detail into different aspects of their imagined future, including changes they anticipate in transit, government, religious and social norms and practices, and healthcare. Some topics, like religion and healthcare, elicited emotional responses as students shared their own perspectives based on their complex, embodied identities. For example, the conversation about healthcare was intricately interwoven with anticipated technological advancements, including near-sentient robotic nurses, and increasing demands on the healthcare system with the imagined influx of climate refugees into the city. While some students imagined vast improvements resulting from technological

innovation, other students, drawing from their already strained relationship with the medical system, believed healthcare services would only get worse:

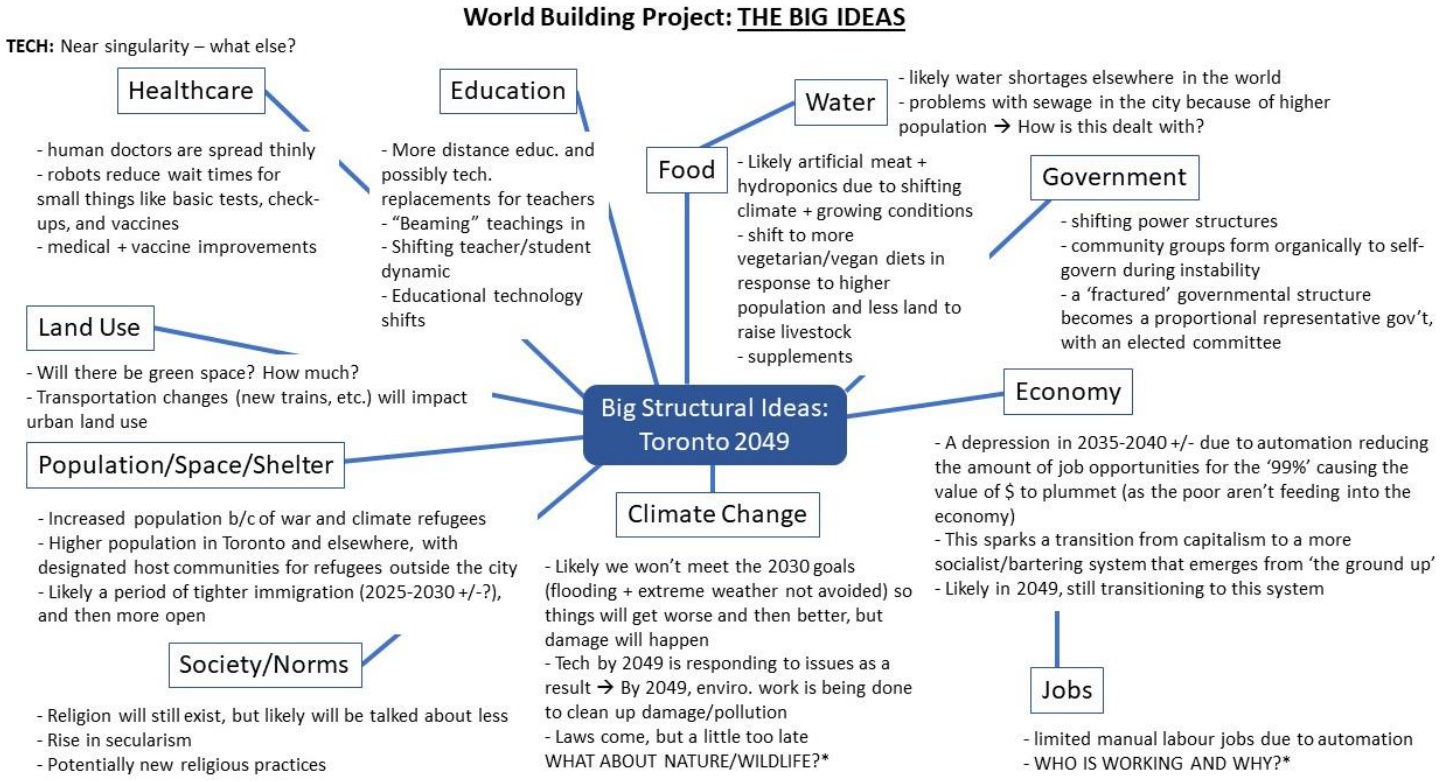
> **Jeffree F.:** Okay - What I'm trying to say more is I do think personally...I do believe, though, that medicine has gotten very advanced and can help people. I think it's more of what you're thinking is like…
> **Zad W.:** Medicine has gotten better, customer service hasn't.
> **Viola C.:** Well, with more people, it's not necessarily going to become easier because there's more people who need to be accommodated…
> **Jeffree F.:** Right. But what I'm saying is, is there going to be something to make it…
> **Ivy B.:** More people means more doctors.
> **Zad W.:** More people also means more fuckin' robots.
> **Jeffree F.:** Yeah, but I feel like...we're all right now, even in a place right now, we're making such advancements in hospitals to make it easier for people to get the help they need. I feel like in 50 years, obviously, in my opinion, I feel like it will improve.
> **Viola C.:** That...I mean, that I *don't* [verbal emphasis] agree with...

This interaction exemplifies the kind of disagreement that students had to contain within the world building project, establishing the changes they imagine occurring – robot-supplemented healthcare – without foreclosing on diverse perspectives regarding the potential impact of that change. As a significant area of speculation within the project, healthcare was a necessarily contentious issue not only because of disagreements regarding how change might disproportionately impact certain populations and their care in different ways, but also because of students' differing medical experiences *in the present*. Viola drew from her previous experiences receiving poor healthcare to express unshakable concern at what more demand on the healthcare system might mean for those in need of support. Alternatively, Jeffree drew from their own inadequate healthcare experiences to imagine how the challenges they faced receiving compassionate support might have been improved through offloading routine procedures onto robot nurses. Meanwhile, Zad and Ivy focused pragmatically on how the system might effectively respond to more demand - specifically citing that more doctors would immigrate due to climate alongside other climate refugees, and that more robotic support in response to a higher population would be needed. Their contributions

mediated the more emotionally charged discussion regarding healthcare between Jeffree and Viola. Following this process across a range of 'big picture' topics and through building off of the first full-class collaboration meeting and subsequent in-class discussions, by the end of these two supplemental discussions students had established the following 'big ideas' as a jumping-off point for their first wiki entries:

Figure 6.3

"Big Ideas" Chart from Collaboration Meeting 1



Note. This figure is a digitized version of a chart created by hand in collaboration with a student notetaker, converted for legibility.

While questions still remained at this point, students signed up for the wiki entries for the above topics and began researching and 'filling in' details which would further shape the Toronto 2049 project.

Collaboration Meeting #2: Exploring Challenges. The second collaboration meeting was scaffolded to provide students with an opportunity to collaboratively explore emergent challenges that people in the future Toronto they are building might face, and to address their own process-related challenges engaging in world building. This meeting provided students with space to share their initial views on how the project was coming together, and to work through additional gaps in the world structure. This work was done in anticipation of second-tier wiki entries, through which students would build the timeline between their present and the future and begin to expand upon the social and political dynamics of their imagined society.

During this meeting, many students were initially resistant to the idea that people in the future that they had constructed would face any significant challenge, as they felt that they had addressed the issue of economic disparity and poverty. Additionally, with the emergence of a more community-oriented 'fractured' government, many students were reluctant to acknowledge the potential that not everyone would feel this society was a perfect one. Eager to have 'perfect solutions' to any anticipated problems, a few students therefore began the meeting by defending the elements of society they had taken on for their first wiki entry. Students who had not attended some or all of the previous meetings had questions about the government and economy wiki page in particular, which had since been populated collaboratively by Jeffree and Ivy as a two-topic page. Viola, who self-identified as "the only conservative in the room" in a later meeting, voiced the concern that this society would likely be politically polarized. While other students dismissed Viola's concern, her hesitation remained: "There's always going to be people who are going to not feel represented - like *always.*" Despite being reminded of the fractured government structure by other students, Viola remained concerned specifically about rising rates of immigration increasing

representational demands on the government in a community-oriented and continually shifting political structure.

> **Brittany:** So you think, then, that there might be some challenges with making sure that this...this fractured or representational government is actually inclusive to everyone?
> **Viola C.:** Well, I think they [the government] will try. They'll try their best to be like...that's their priority. But at the same time, there's always going to be somebody somewhere, somehow who's not going to agree with it, and then they're going to maybe rebel against the government or...there's always going to be something.

Following this interaction, Viola also expressed concerns about how long decision making might take in a society with a ballooning representational system as the political field expands to accommodate increasingly differing worldviews. Concerned about growing divides from community to community, Viola advocated for a section in the government wiki that discussed these challenges, maintaining that there will always be people who do not feel represented, and that the representational burden of this system will deeply impact the government's ability to respond to emergent concerns. In this way, the collaboration meeting served as an opportunity for the group to workshop ideas as different people offered their perspectives. Significantly, it also acted as a catalyst for students' reflections on the imperfect nature of social structures, and the impossibility of totalizing solutions; an important step towards building a capacity for uncertainty when thinking towards and with the future. While an effective way to address continuity issues across sections of the project, this process also did not always resolve disagreements; rather, as is the case with the government example above, the meeting provided a space within which students could situate themselves in a dynamic, messy, and uncertain future that was improved in many ways, but that was not without its challenges.

Collaboration Meeting #3: Exploring the Future. The third collaboration meeting was largely designed for students to share their wiki contributions and delve deeper into the details of the future that they had envisioned. The sharing process helped students further explore how

different topics intersect and mutually inform the development of an interconnected and dynamic world, and allocated time for students to ask each other questions about wiki pages they felt might impact what they were working on. For example, the student who wrote the page “Jobs Post-automation” used this meeting as an opportunity to share what they had done and ensure that it fit with the way the student writing the page on automation and the economy was developing their contribution. Based on this conversation, the student writing the page on education also had an opportunity to ask questions before they started writing:

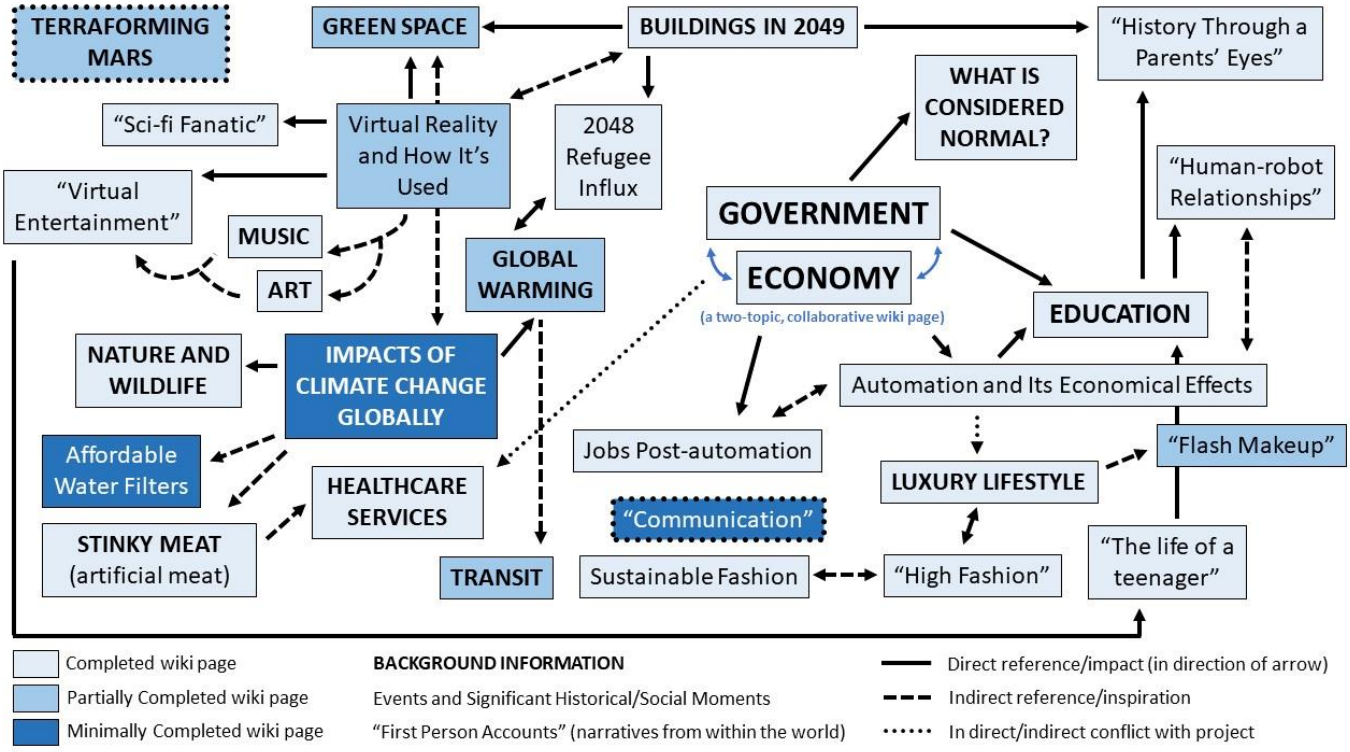
> **Jeffree F.:** Were you jobs? [Kai nods] Can you tell me the rundown of what that was?
> **Kai K.:** I thought there was a shift in employment because of automation, but that there's actually more jobs, but the people are not skilled enough to do it because it's different kinds of jobs. It's a different skill set. So...there was a decline in basic cognitive tasks and manual labor. So like, all those people that were working those jobs or have that level of education are unemployed or are looking for jobs if they were unable to make the shift. But there's an increase in like...HR, I.T. programming, tech management in order to secure automation.
> **Zad W.:** So since I'm doing education, would you say that that would mean there would be less like...trade based schools and more like...?
> **Kai K.:** I just said that there was...it was going to be like more focused on tech and like human relations.
> **Zad W.:** That's good to know. I haven't really done much development online. So I'll work on that.
> **Kai K.:** And also because of the healthcare, there's like...people are trying to educate for the specialized doctors again. Right? Because it's so thinly spread. So... but like I said, the automation, the major change happened in 2030? So like now, in 2050, it's looking a little bit better. In terms of education.
> **Jeffree F.:** [Ivy], does your automation timeline line up with [Kai's]? She said it...the switch happened in 2030.
> **Ivy B.:** I didn't write down any specific dates yet.

Having time allocated for sharing and collaborating directly on different aspects of the project was an integral part of the world building process, and allowed students to integrate pages on healthcare, meat and food production, immigration related to climate change, and housing into the broader scope of the world students had begun to build.

Viewing issues as interconnected and continually evolving was an ongoing challenge for students, but a focus on concrete collaboration through hands-on editing during and following this meeting helped students form stronger connections across aspects of the world building project.

Figure 6.4

Toronto 2049 Wiki Entry Connections by Topic, Wiki Level, Completion Level, and Reference Type



The above chart traces some of the connections between the pages that made up the final world building project. Importantly, this meeting allowed students to think through the ways in which their work is connected, even without direct reference. Through taking the government and economy page as the central starting point for many of the other wiki pages, this meeting also facilitated students' movement beyond 'big ideas' pages towards increasingly detailed contributions that helped add texture and history to the future they collectively imagined. While wiki page creation was not without disagreement, as illustrated in the connections marked 'in

direct/indirect conflict with project' in the chart above, the collaborative process which structured the project meant that a student, passionate about high fashion, had to find a way to write about what that industry might look like in a society which has largely moved towards sustainable options and away from consumerism. The students writing on high fashion, biodegradable textiles and sustainable fashion, societal norms and values, and the economy, had to discuss how each of their topics impacted one another, and collaboratively find ways to make space for their unique perspectives within the project. This process mirrored Lisa Tuttles's (2005) emphasis on acknowledging that a world is an "ecology" of moving parts, which must holistically come together in students' complex future imaginaries (p. 40).

Collaboration Meeting #4: Thinking about Consequence. The final meeting was shorter, and largely designed to make space for reflecting on the world building project, and for students to discuss final touches and things that they still wanted to include in *Toronto 2049*. This collaboration meeting also served as a pre-interview conversation through which students could reflect on the specifics of their collaborative writing experience before discussing in the interview if and how the project impacted their perspectives on the future. This meeting focused largely on process, although students began by talking about what they felt was missing in the project right away; social media was the primary area students felt no one had explored, that would have been an important aspect of society to take up. Most of the topics that students mentioned in this meeting, like social media, they discussed without creating an accompanying wiki page. Instead, the group worked through how topics would fit into the world they had already created. Conceptual coherence through discussion was a bigger priority for students at this late point in the project, versus making a comprehensive wiki entry, so students took this opportunity to discuss topics and agree on an overall framework for aspects that did not end up having dedicated wiki pages. For

example, given the infrastructure of virtual reality (VR) built into the project already through education and artificial environments in small urban apartments, one student argued that VR would be the main platform for social media and communication.

Students also took the opportunity to discuss how the project connected to the present. Significantly, one student mentioned how they saw on the news that the Toronto islands had flooded over the weekend (Wilson, 2019), sparking a discussion about how the effects of climate change might be impacting the city sooner than they had anticipated in the project. This topic helped them assess a serious gap in the world as well, as the students who were supposed to complete the pages on global warming and climate change stopped attending class midway through the unit. As a result, the impacts of climate change had been embedded throughout students' wiki entries, rooted in discussions they had across the project instead of in dedicated wiki pages. Regarding its connection to the present, the group also discussed how the future they imagined compared to the present in terms of identity, discrimination, and social norms. One student, an early advocate of imagining an alternative economic system within the project, expressed confidence that racist, sexist, homophobic, and ableist discrimination would continue to decline, particularly as individuals were provided with more freedom to live fuller lives outside of oppressive, capitalist notions of productivity as money gradually lost its value.

Interconnected and Incomplete Imaginaries

The collaborative storytelling process had profound implications on the kind of world that students built and the futures they allowed themselves to imagine. Across collaboration meetings, discussions, and impromptu small group work with each other, students constructed a world that could only have been formed through the coming together of their myriad experiences, hopes, fears, and distinct preferred, possible, and probable futures. The more narrative-oriented,

character-based accounts of Toronto in 2049 illustrate how collaborative storytelling can be a significant pedagogical catalyst for students' learning with and from one another, in pursuit of imagining different figured futures than those thought possible through individualistic means. In one example on human-robot relationships, a student framed their wiki entry through an imagined anthology titled "*Oil for the Soul: On Robots and The Humans Who Love Them*," coining the term 'inter-natural relationships' to describe an entire community that advocate for the legitimacy of relationships between "naturally occurring people (humans) and artificial people (robots)." Writing in the first-person through an entry in the above fictional anthology, the student tells the love story of an unnamed naturally occurring human and their partner - a robot named Tinker. Significantly, this student went beyond simply telling this couple's story, by exploring challenges and discrimination that the imagined inter-natural community faces, support shown for the community, and the social norms and values of society in general, as is evident in the following excerpt:

> *Few, if any societies, recognize internatural unions as official marriages. As the sentience of robots continues to be hotly debated, the range of attitudes towards humans that marry robots has been highly negative. Supporters often liken this to the time period before interracial and same-sex marriage was legal. Scientific journals have long proven that parents' wellbeing and children benefit from being raised by parents who are in legally recognized unions. Supporting groups argue that human-robot unions who choose to adopt a child should be allowed to marry, as it benefits both the child and the parents. Adoption is a complex topic in the internatural relationship community. Though robots and humans can co-parent a child, the human half of the relationship is often recognized as a single parent with a robot servant.*

This student simultaneously tells a personal story of the couple and imagines the broader context in which members of the internatural community live their lives. In the wiki entry, the student alludes to interconnected issues of automation and questions of robot sentience, the rise of human services occupations, and societal expectations around family structures. This page also makes an important contribution through acknowledging that life in Toronto in 2049 is not perfect despite

improvements. The perception of *how* improved this society is, is further complicated by intersectional identity and experience as students use their own vantage points to imagine what it might feel like to live within this future.

As shown in the figure 4, not all topics discussed ultimately fell within the purview of the *Toronto 2049* project (i.e. religious practices of the future, which were discussed but not included in any substantial way in the framing of the storyworld), and not all topics that were integral to students' thinking ended up having fully completed wiki entries associated with them (i.e. climate change, which has two related wiki entries that were both taken on by students who faced barriers to attendance, resulting in both pages remaining incomplete). Some of these incomplete contributions impacted the world building project more than others. Returning to the topic of climate change, students were continually frustrated when they would try to reference to climate change wiki entries – particularly given how much climate change would impact their imagined future and how much time had been spent discussing it – only to find the pages incomplete. However, the incomplete status of the project was also in many ways inevitable, as the structure of the world building project allowed for relatively endless development. In something as expansive as an imagined future or society, students also had to come to terms with the ways in which their future would remain incomplete, particularly given the limited timeframe for the study and the myriad factors that impacted some students' ability to fully participate. Discussions and collaboration meetings helped students fill in conceptual gaps, however, and they eventually had to prioritize issues that were most critical to them. For example, conceptual content required regarding the status of climate change was a focus of discussion as students worked together, in lieu of the students responsible for this topic completing their entries, to verbally imagine how climate change might impact their narratives. This required a certain amount of reflection and self-

evaluation, as students considered the parts of their future world that were most critical to their personal future imaginaries and collaborated with others to realize those parts of the storyworld. In spite of the incomplete aspects of the world that students built, the process allowed them the freedom to think about the future in ways that were previously underexplored; as open, subject to change, capable of surprising them through its radical difference from the present, and, most significantly, as a collective endeavour as they moved forward towards uncertain but infinitely expansive futures in community with others.

Navigating and Embracing Dissensus: Student Perspectives on World Building

Given the emphasis on collaborative world building and the integration of students' differing perspectives on future possibility, the world building project was envisioned as an important site of contestation and dissensus, as opposed to the centering of consensus via a liberal democratic approach. The goal of radically democratic engagement moves away from achieving consensus, and towards widespread participation in the dynamic process of democracy; a continually unstable and ever-changing political state characterized by the ceaseless disruption of pre-existing systems, structures, and views through claims for equality (Biesta, 2011; Rancière, 1998; Thayer-Bacon, 2001). Considering this and Sharon Todd's (2009) argument for political, agonistic dialogue being integral to the preservation of democracy in educational contexts, democratizing education values, cultivates and facilitates opportunities for moments of contestation to emerge, and subsequently change the pre-existing structures of engagement both in and beyond traditional educational spaces. In the context of Todd's work, and similarly in this study, taking a radically democratic approach necessarily meant making space for students to explore the world and tell stories on their own terms, and take on the difficult task of navigating

the disagreements that emerged as they built on each others' conflicting ideas about the present and future possibility.

This process of collaborative, contested imagining also involved students navigating between different preferred and probable futures. Students' experiences engaging with SF texts and thinking through the genre as representations of "radical alterity" (Freedman, 2000, p. 55), alongside using science fictional storytelling as a form of present critique (Sullivan III, 1999; Thomas, 2013), gave students imaginative space to play with possible radical changes in their future-oriented storywork, while simultaneously basing their fictional projections on issues concerning them in the present. Importantly, the myriad 'novums' – high-impact 'new' aspects in the envisioned future that signal profound difference between the fictional storyworld and present reality – also served a disruptive capacity, mirroring the radically democratic theoretical orientation underpinning this world building approach as students imagined fundamental and sometimes dramatic changes to contemporary society as a foundation for their future imagining. Given the way the present informed the imagined future, representations of the future subsequently disrupted students' thinking in the present. Through this work, some students explored societal issues like climate change and political governance, while others used processes of extrapolation to think through personal challenges, navigating what they imagined to be both preferred and probable possibilities based on their experiences. Embracing the interplay between preferred and probable futures became an important part of the project for students, even as they brushed up against each others' differing views on what preferred, probable, and possible futures might look like. Having the conceptual freedom to imagine difference, while at the same time working through processes of extrapolation to ensure that their entries were within the realm of possibility, also

proved to be empowering. In the exit interview, students noted that the fact that things they imagined—and which were not *entirely* bad— could actually happen was important to them.

Significantly, the world building project also made space for students to imagine the future beyond common approaches in education rooted in job-preparedness; a phenomenon problematized by one student reflecting on their experience in the study:

> *[The project] was a new way for me to view the future, especially in an academic setting, where the future is often a very self-centered thing. My experience in talking about the future in school was always nerve-wracking, all about choosing a lifelong career at age 18 and going into post-secondary education, burdened with debt.* (Zad W.)

In contrast, the *Toronto 2049* project was structured to facilitate conceptual and topical freedom rooted in collaboration, allowing students an opportunity to research and engage with contemporary issues or concerns from the perspective of inevitable change beyond the individual, while still honouring students' unique perspectives and experiences. For example, this stage of the research occurred in an alternative school setting that supports students who have left the mainstream school system for myriad reasons, and students drew directly from the challenges that they had faced with education, housing precarity, and discrimination to critically inform their imagined future. Placed within the socio-political context of early 2019, students also used the world building project as an opportunity to engage with conversations being had regarding education at the time, including moves to dismantle comprehensive sex education by the provincial government, budget cuts, government support of imposed e-learning, and youth-lead environmental activism, such as the 'Fridays for Future' school strikes. These contemporary issues all informed how students conceptualized change, especially in the context of education. Through collaboration meetings during which students debated how they imagined different social, political, and cultural aspects of the future, students used their experiences of contemporary issues to work through challenges, develop nuanced understandings of broad social issues, and imagine

society anew. If, as Ivy B. suggested in an early group interview, “the problem with school is that we don’t talk about the future at all,” then world building projects such as the one described in this chapter provide space for critical discourse in classrooms – in some instances allowing students to think seriously about educational possibility and, in turn, allowing them to reflect collectively on their own relationships with schooling.

The democratic approach to world building taken in this project also encouraged students to imagine the future as a collective endeavour of survival and change as they navigated tensions within their unique perspectives, positions, and experiences. The process of collaborative world building provided opportunities for students to hear each other’s perspectives, and therefore take on the challenge of incorporating their hopes and fears regarding the future into the collective frame of the project, even when students’ positions seemed wholly incompatible. Topics like economic change were particularly fruitful for this kind of work as the group sought to imagine a future beyond capitalist modes of production through automation and resource distribution, while still attempting to incorporate the imaginaries of students who struggled to imagine a future beyond social class. In a written reflection at the end of the study, one student described the collaborative nature of the project in the following way:

> *(un)Surprisingly, the trickier part of the project was the main part of it -- the collaboration. It took quite a bit of time to decide on certain ideas, especially the larger parts, considered to be the ‘foundation’ of the project. I suppose this is because it was rather hard for us to agree on major topics, due to opposing viewpoints. However, this is what made the world building unique and colorful, with people from many different backgrounds and with different experiences coming together to imagine a brand-new world. Despite how difficult it was to agree on certain ideas, it made for a far more interesting future than a single group of like-minded people could make on their own.* (Alyssa M.)

While disagreements in classrooms are often resolved quickly through consensus-seeking efforts (i.e. a vote, or an executive decision made by the teacher), ample time was provided for students to work their differences into the project across differing preferred, probable, and possible

imagined futures (Bell, 1998). Consequently, analysis of students' interactions across interviews, collaboration meetings, and creative processes during the world building project shows an increase in students' sense of community and willingness to be open to others' views. World building through science fictional storytelling provided space for students to grapple with their concerns, imagine possible sources of hope, and ultimately take ethical responsibility for myriad others as they engaged in present critique with peers who potentially face different challenges than they do.

Figured Futures and Present Agency

In this chapter I have described how a certain kind of storytelling, specifically speculative and collaborative world building through SF, can catalyze a reframing of the figured worlds and, subsequently, the figured *futures* through which students act in the present as they move towards future possibility. Building upon Holland et al.'s (1998) assertion that figured worlds "rest upon people's abilities to form and be formed in collectively realized "as if" realms" wherein "identities and agency are formed dialectically and dialogically in these "as if" worlds" (p. 49), the storywork explored here in many ways literalizes the construction of 'as if' worlds through which students could rethink what is possible for them, and the role they might play in realizing *different* futures. Of course, Holland et al. caution that the formation of figured worlds created in the context of social play can take months, weeks, and even years to develop, and that new figured worlds do not "necessarily endure the transfiguration beyond the local sites of their production" (p. 285). Given this, the world building work done here as an act of figured world construction is, admittedly, the beginning of a much longer process of reforming the future-oriented narratives that schools make space for. However, if figured worlds are stories that we tell about the present world through which we understand and live our lives, then the concept of a figured future in this work stands in for the myriad stories we tell and assumptions we make about the future; what a future is, what it might

look like and, significantly, who determines the parameters of that future. For the students in this study, the stories that they told about the future *mattered* to them.

As illustrated through their storytelling experiences and reflections on the world building process, the students in this study benefited from and yearned to be an agential part of figured future formation; indeed, in a time characterized by fear, youth need to be included in creating new orientations towards the future that are rooted in the potential of present change. Problematically in education, narratives of the future are often determined within hierarchical and institutional power structures. When a curriculum focuses disproportionately on individual, capital-driven success, a figured future characterized by individual and competition-driven success is formed through which present action is determined; only actions that contribute towards an anticipated future of acceptable participation in society is allowed. But as students in this study continually expressed, they need more and expect more from school than a singular version of acceptable action that excludes so many young people. In this sense, the world building work described in this chapter manifested as a means of disrupting the normative figured future of school, as students were tasked with taking on identities *as* decision makers; people who, collectively, can have a non-normative opinion about what the future might look like, decide what is preferred, probable, and/or possible, and form community around contested, uncertain, and complicated but hopeful possibilities.

Conclusion: Towards a Speculative Pedagogy

The genre-focused exploration of SF and the world building project described here highlights the potential of science fictional and speculative world building to bring future possibility to the pedagogical fore, a move towards a kind of speculative pedagogy. This is especially critical in an increasingly polarized age wrought by economic and racial inequity,

climate injustice, and political alienation, where future-oriented pedagogies and curricula must open possibilities for new questions and discourses in contrast with the singular and exclusionary figured futures often privileged in schools. Importantly, the first stage of this research explored the potential of telling stories together as one way to find hope in futures that are fundamentally different from the present, in a time when reimagining is needed. The world building project described in this chapter was also positioned as one way to take on the responsibility of making space for radical and dynamic future imaginaries through curricular design, where student voices and perspectives are at the centre of future-oriented learning. As such, the importance of students having a space within places of learning to reimagine the world instead of reinforcing it as-it-is, and to push against a present that is structurally and systemically inequitable and broken, is at the foreground of the findings shared here. Creating intentional space for this work allowed students to work towards something new and unexpected in its difference, which helped participants use their collective voice to imagine change together.

In taking a collective and radically democratic approach to speculative storytelling, students had to take on the responsibility of building a future imaginary that all contributors could share and navigate together. However, findings from this study also signal an ethical imperative on the part of educators, curriculum and policy designers, and educational systems to take responsibility for making space in schools to seriously address the future both pragmatically and conceptually with students beyond the current framework of skills-based preparedness. While students had to take the lead in navigating tensions within the project, space and support to do so on the part of the facilitators was an intentional and crucial part of this work. As alluded to previously, during the first interview students cited that they felt the future was not meaningfully addressed in schools at all. However, when discussing their world building experience at the end

of the study, students reflected on how much fear they had been internalizing with regards to future uncertainty. For these students, the world building project allowed them to work through these concerns together as a community, integrate hope into their conceptualization of the future, and empower themselves as they claimed agency over present change. This study reaffirms, as research in futures studies suggests (Green & Gary, 2016; Hicks & Holden, 2007; Rubin, 2013), that educators must take on the responsibility of making space for this kind of collective, creative imagining to occur. As part of a move towards a speculative pedagogy, collaborative storytelling work such as the *Toronto 2049* project can help students build new figured worlds and figured futures for themselves, in which change is not only possible, but inevitable.

In the next chapter, I will discuss the second stage of this research, which involved using findings from this work with secondary students to adapt science fictional world building approaches to teacher education contexts. Both stages of this research share the common thread of speculative pedagogy, and the importance of making space for alternative future imaginings in education, where different futures beyond exclusionary societal norms and institutionally-mandated possibilities are so often foreclosed upon.

Chapter Seven: Speculative Pedagogies in Teacher Education

> *It's Monday morning. My alarm rings at 8:55 and I have 5 minutes to get to class. After washing my face, I power on my iPad and move my robot through the halls until it reaches Math Class. I find my seat just as Instructor #23 begins the lesson. The rest of my 135 classmates are signed in from 29 different countries - Noor is logged in from a cafe in Kabul, Yabani is joining the class from Jos, and Prem is attending from a library in his town of Dinajpur. We all speak different languages but have no problem understanding each other through the automatic translator app. But other than chatting about the classwork, we haven't managed to become friends. I try to make jokes but nobody seems to understand; I'm laughing to myself behind the screen but all they see is the blank face of my robot. It's even harder to get along with our Instructors - they try to connect with us but we are all very careful about what we tell them because it could trigger their automatic responses. Once, Sukhi from Mumbai, complained about his drunk dad and Instructor #45 automatically called the authorities to investigate his parents. Sukhi hasn't attended class since that happened 5 weeks ago.*
>
> "Teachers of the Future" (Narrative, Wiki Entry)

Overview

The second stage of this research was conducted in the Fall of 2019 with a group of pre-service teacher education students in a mandatory course on new media and literacies; it structured based on the findings from the *Toronto 2049* project run the previous Spring in a secondary English class. Data collection in this part of the research took the form of an assignment on wikimedia and digital storytelling embedded within a pre-service[3] teacher education course on new media literacies and educational technology, and was designed to further explore the concept of speculative pedagogy (Hellekson, Jacobsen, Sharp & Yaszek, 2010; Weaver, Anijar & Daspit, 2003) and how speculative and science fictional storytelling can be mobilized to imagine myriad possible futures within and beyond education. The assignment described here specifically asked students to select a contemporary issue or area of interest within education, and use science fictional storytelling approaches (Hergenrader, 2019; Tuttle, 2005) to extrapolatively imagine the

[3] The terms 'pre-service teacher' and 'teacher candidate' are used interchangeably in this chapter.

future of education by building from their present understanding of and experience within the world. An element of this assignment also involved listening: asking mentor teachers, colleagues and peers, and friends and family about contemporary issues in the context of the future; exploring research on the future and future possibility; and engaging with others' future narratives on the course wiki platform. Through this approach, pre-service teachers' narratives were formed dialogically, rooted in contemporaneous experience, concerns, and hopes for the future. In the excerpt above, this pre-service teacher formed her imagined future around mandatory online course policies being implemented by the provincial government at the time (Ontario Newsroom, 2019), and fears that high school students had expressed to her regarding the potential of online learning to overtake in-person, socially-oriented learning contexts. In this vein, many of the stories shared in this chapter were created through conversations with students, and pre-service teachers' own hopes and fears.

While this study was conducted the Fall semester prior to the COVID-19 pandemic that closed schools in Ontario in March 2020 (Nielsen, 2020), many of the future worlds that pre-service teachers imagine draw upon anxieties of future isolation and uncertainty. Their anxieties were, in many ways, realized throughout the following year and a half after the course in which this study took place ended. As this chapter will affirm, even prior to the pandemic, research suggested that both teachers and students alike struggled to imagine a collective future amidst growing concerns surrounding climate change, economic disparity, and the sheer speed of change in contemporary society (Rubin, 2013). Therefore, while this research did not occur within the context of the pandemic, the need for imagining possibility, anticipating challenge, and collectively envisioning life beyond the present has perhaps never been more sorely felt, not only

for youth who are grappling with what it means to grow up in a turbulent world, but also for their teachers who are tasked with guiding them towards new ethical forms of living together.

This chapter also builds from the fact that pre-service teachers are often excluded from debates about educational change given their emergent position into the profession. However, their simultaneous vulnerability as liminal educators and the opportunity they present to bring change to education makes the work of supporting them more important than ever. Subsequently, I consider here what purposeful exploration of imagined futures with pre-service teachers offers when thinking about how teacher educators might support teacher candidates who will enter fundamentally changed classroom contexts, and also how uncertainty and the fears and hopes that pre-service teachers hold regarding future educational contexts have continually shaped their pedagogical development and identities as teachers-in-training. This part of the research was structured by the following questions:

> (a) How do pre-service teachers' interactions with SF and science fictional world building influence their pedagogical beliefs and thoughts on education?
>
> (b) How does exposure to SF and purposeful envisioning of the future inspire a rethinking of possible pedagogies, educational structures, and teaching methods?
>
> (c) In what way does exposure to pedagogies that teach towards future uncertainty influence pre-service teachers' own dispositions towards uncertainty in their teaching practice?

With pre-service teachers' narratives as the primary object of analysis, this chapter will provide an overview of the kinds of futures they imagined and subsequently describe the hopes and fears they explored in relation to the contemporary issues that they engaged with. I will also examine the structural approaches that students took to building their imagined educational futures and will

share examples of student work that illustrate the transformative potential of speculative storytelling for teacher candidates; especially when narratives move beyond near future extrapolation towards complex stories of unexpected possibility emerging from societal challenge.

Speculative Pedagogy

In the previous chapter, the potential impact of speculative pedagogy - an approach to teaching in which the prospect of myriad different futures that push back against the inevitability of normative present continuance is foregrounded in teaching - was explored in the context of student learning. A central tenet of this approach is the valuing of curricular designs and approaches that make space for student voice in future-oriented learning, and creating intentional opportunities for students' perspectives and experiences to disrupt established structures that govern how student learning looks in traditional classroom contexts. While this work was still necessarily conducted within a conventional classroom, albeit in an alternative school, and therefore had to include elements of student assessment and direct connections to the Ontario curriculum for English (Ministry of Education, 2007), the stage of research in the previous chapter was the result of efforts to introduce space for disruption through open, student-driven discussions about the future catalyzed by speculative and science fictional narratives. Building off this exploration of speculative pedagogy with secondary students, this chapter explores how speculative storytelling might similarly support pre-service teachers in imagining different futures together, focused specifically on educational change.

As in the work with secondary students, the concept of figured worlds is crucial to understanding the impact of this work. Just as the construction and enactment of figured worlds influence the possible identities youth inhabit and how they conceive of possibility (Holland, Lachiotte Jr., Skinner & Cain, 1998), pre-service teachers grapple with additional figured worlds

of the teaching profession, and its associated assumptions regarding what constitutes 'good' teaching and what teaching and learning *ought* to look like. Teacher education has been and is increasingly reduced to mandated deliverable outcomes, often based on the political will of decision makers rather than on what will effectively serve pre-service teachers, their prospective students, or broader democratic society (Cochran-Smith, 2004). The deliverable outcomes which characterize contemporary teacher education, such as the mandatory math exam implemented by the provincial government during this study (Jones, 2019), often further reinforce deeply entrenched figured worlds of teaching, defined by narrow measures of what it means to become and be a successful educator. In consideration of COVID-19 and the increasingly uncertain nature of education, pre-service teachers also do not benefit from teacher education programs that prepare them for a singular, prescriptive view of what teaching and learning might *look like*, defined by quantifiable learning outcomes. As abrupt shutdowns due to the pandemic revealed, the foundation of the educational monolith is not so secure.

Building off Karen Anijar's (2004) chapter contribution to her co-edited volume *Science Fiction Curriculum, Cyborg Teachers, and Youth Culture(s)* alongside John A. Weaver and Toby Daspit, it is critical to examine further that "when we think about one way to educate, one direction of education, we forget that there are always other paths, other ways, other visions of looking at what may yet be" (Anijar et. al, 2004, p. 2). With the value of 'other paths' and 'other ways' of thinking about education, this chapter will examine how science fiction (hereafter SF) and speculative storytelling offers another path towards reconfiguring the figured worlds through which pre-service teachers build identities and pedagogies and, importantly, how they construct new figured futures through which they might imagine education otherwise. As argued throughout this chapter, mobilizing SF and speculative genres can make space for the unexpected, especially

in education where ideas about how teaching 'should' look are already frequently determined *for* pre-service teachers; not *with* them.

Science Fictional Storytelling

In this research, SF is positioned not only as a genre which focuses on representing "radical alterity" (Freedman 2000, p. 55), but also one that helps readers and creators alike in navigating difference (Campbell, 2019). While engagement with difference often manifests in SF through tropes such as aliens and robots in shallow views of the genre, SF also allows us to imagine future possibility, societal change, and radically different futures beyond common notions of progress. Although throughout the mid-twentieth century SF was written by and for predominantly white, cisgendered, heterosexual men, since its emergence into academia, the genre has been increasingly shaped by 'other experiences: the working class, women, writers of color, queer writers, disabled writers' (Hopkinson in Rutledge, 1999, p. 591). In this way, SF is increasingly mobilized as a subversive literature through which we can imagine *otherwise*; to build upon the past, critically interrogate the present, and write in pursuit of possible futures. SF facilitates this kind of narrative engagement and exploration in part through its structural characteristics: the presence of a novum, the 'central imaginary novelty' (Csicsery-Ronay Jr. 2008, p. 47) in an SF text that signals the world of the text is different from that of the reader; extrapolation, the process through which the present empirical reality of the author informs the imagined future of the text; and cognitive estrangement, a term used to describe the readers' experience realizing the *world* of the text is not their temporal reality, forcing them to see both the fictional and *real* world anew (Campbell, 2019).

Relatedly, while the futures featured in SF texts are fictional, most imagined futures are extrapolated from real issues or phenomena and draw from myriad societal orientations towards the future and, as such, can also support explorations of specific present issues, future hopes and

anxieties, and dispositions towards potential change. Examining beliefs about the future, Nick Montfort (2017) advocates for moving beyond feelings of inevitability through processes of *future-making*. This orientation, described as "the act of imagining a particular future and consciously trying to contribute to it" (2017, p. 4), positions individuals as having agency in the context of transformational trajectories, rather than viewing themselves as beholden to inevitable events across time. The importance of this shift in agential positioning is echoed by Erik Olin Wright (2010) in *Envisioning Real Utopias* who argues that the kinds of stories we tell about future possibility have tangible impacts on what changes actually *are* possible, asserting that "social limits of possibility are not independent of beliefs about those limits" (2010, p. 23). Subsequently, by telling stories about change and alternative futures, we collectively contribute to making even utopian ideals viable in our collective consciousness. Working within this framing of SF as a genre that can generate agential and imaginative potential, the research with pre-service teachers described in the remainder of the chapter explores how speculative storytelling focused on radical change might influence pre-service teachers' development of expansive pedagogical orientations towards present and future change.

Writing the Future of Education

Given the structural approach I took in teaching about SF and science fictional world building, teacher candidates' digital storytelling exercises centered around two key aspects of SF: extrapolative storytelling, through which students began with their contemporaneous understandings of the world and followed possibility stemming from those present-rooted perspectives towards possible futures; and novum construction, where students imagined a central catalyst of change and traced its impact across and beyond educational paradigms. Through these two narrative elements, pre-service teachers were tasked with identifying key issues of importance

to them, and using digital storytelling to reflect on the following questions: as things are now, what might the future of education look like? How do our unique perspectives and positions impact the futures we imagine? Why is the work of looking forward and imagining possibility important for us, both in and beyond school contexts? Given the reflective orientation of these questions and the assignment more broadly (Appendix H), not only were students tasked with imagining a possible future, but also with considering why it might be important for their developing teaching practice *to imagine* possible futures.

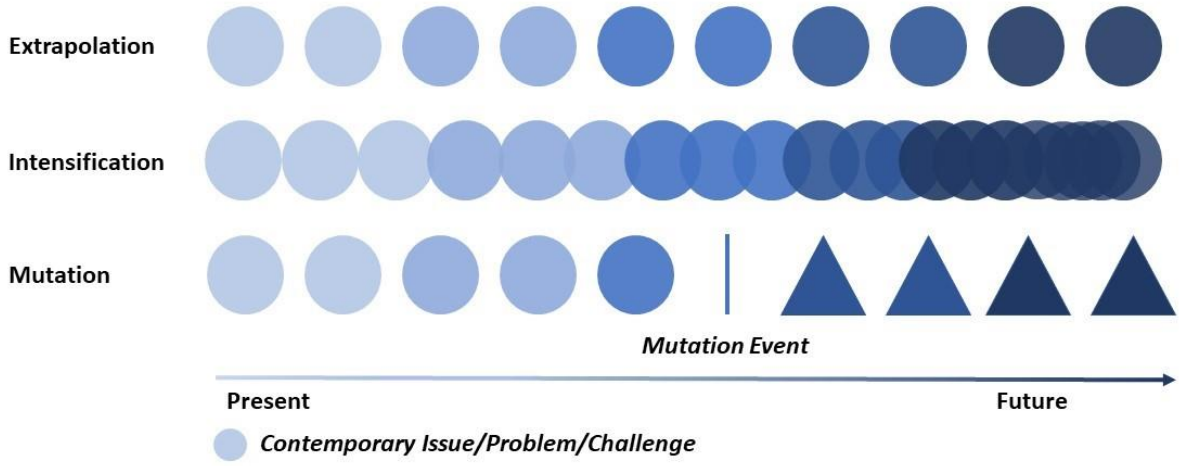
Of the 69 students who agreed to have their assignments included in the study across two sections of the course, 10 students either did not specify a year in which their narratives took place, or crafted narratives that spanned multiple temporal locations. Of the remaining wiki entries, six took place before 2030, 18 between 2030 and 2050, 26 between 2050-2100, and nine after 2100. Similar to the rationalization of students in the first stage of this research, many teacher candidates opted to write in a semi-distant future where significant change could be imagined, but in a society close enough to their own temporal present to be easily extrapolated. Almost half (n=33) of entries mobilized a dystopian narrative trajectory, therefore exploring the worst possible outcomes of present issues that were central to pre-service teachers' anxieties regarding the trajectory of education. Seventeen students used distinctly utopian genre conventions, examining positive possible outcomes of current educational innovations and dynamics. Two students moved beyond SF storytelling structures, taking a more fantastical approach through the integration of magic into their future-oriented narratives. The remaining 15 wiki entries mobilized SF narrative tools, including the construction of a novum around which narratives were built, but students either provided descriptive content of novums, but did not deeply explore the impact of change on an

individual or societal level, or they did not write enough content to categorize a dystopian/utopian narrative trajectory.

Beyond an assessment of dystopian/utopian-leaning narrative trajectory, pre-service teachers' world building and digital storytelling assignments were also coded based on narrative orientations towards change, and students' willingness to envision increasingly different educational futures. The narrative approaches to imagining change outlined in Matthew J. Wolf-Meyer's (2019) *Theory for the World to Come: Speculative Fiction and Apocalyptic Anthropology* were used to explore what students' imagined futures say about their belief in the possibility of significant change, and their willingness to imagine beyond present educational structures.

Figure 7.1

Visualization of Extrapolation, Intensification, and Mutation Narrative Approaches



The chart above illustrates the three narrative approaches used to analyze pre-service teachers' narratives: extrapolation, intensification, and mutation. As shown above, stories that use predominantly extrapolative storytelling approaches trace a continual, logical progression of contemporary issues into the future relatively unchanged. In contrast with the extrapolative question '*what if [this contemporary issue] continues?'* narratives that mobilize intensification

arcs build worlds around the question, '*what if [this contemporary issue/phenomena, etc.] gets worse/intensifies?'* For example, in the first stage of this research, secondary students imagined the wealth gap widening exponentially in the future, intensified by imagined automation, that eventually resulted in an economic collapse preceding the world of Toronto in 2049 in which they wrote. Of the pre-service teacher narratives that utilized a clear narrative structure (n=53), 40 told extrapolative or intensified stories built upon their analysis of present issues in education. Extrapolative stories in particular were most likely to depict more subtle changes that reinforce continued systems and structures from the present, and mobilize more shallow novums. For example, one story took place in a conventional classroom and detailed an assignment in a history class that involved a "hop trip" to three different museums mediated through virtual reality, supplemented with 3D printed historical artifacts so students could feel objects as they navigated exhibits. While exploring an instance of technological innovation and its impact on education, the novum around which this story is centered, and the accompanying narrative structure, does not facilitate a deep reimagining of school. In contrast, the final narrative structure, mutation, departs in significant ways from the present through the use of a mutation event - for example, a pandemic, nuclear war, or a solar flare impacting all technology - that is usually unpredictable. The bulk of storytelling occurs in the aftermath of such an event, in a wholly unfamiliar new future within which the writer can imagine radically different possibilities. Only 13 students used some form of mutation in their future narrative construction, which suggests they may have been hesitant to grapple with uncertainty and the open expanse of a fundamentally changed world. In contrast, the insistence on mobilizing extrapolative narrative structures by many students suggests a commitment to current educational systems and structures; a clear departure from the secondary students in stage one who sought to fundamentally reimagine society through their speculation.

Given that students completed this project in the context of a course on new media literacies and educational technologies alongside the prevalence of scientific and technological innovation in much of SF, many of the future narratives of education also focused in some way on the extrapolated impact of present technologies, and imagined future technological and scientific change. While approach widely varied - with some students celebrating technological possibility and others warning against any significant implementation of technology in the classroom - many students used this assignment as an opportunity to reflect on their own relationship with emergent technologies, the social impact of increasingly digitally-mediated forms of communication, and how they conceive of their own use of technology in relation to their developing pedagogies and teaching practices. While many pre-service teachers focused on other issues, such as governmental structures and the design of educational policy and curricula, increased segregation along lines of race and class impacting education, and community-based educational responses to crisis, underlying all entries were fundamental questions about education which informed students' imagined futures: Why do schools function in the ways that they do? What is the purpose of school? Of education? Does 'education' only happen in schools? What *is* the teacher's role in student learning? And importantly, dependent on the rate of change envisioned, how might that role change?

Imagined Futures in/of Education

As noted above, a few contextualizing factors impacted the kinds of futures students imagined; the first being the focus of the course. Influenced also by the prominence of technological and scientific innovation inherent in much SF, technological change and its impact on schools featured heavily in many students' future narratives. The role technology played varied widely, with myriad technological innovations positioned as either utopian tools to, for example,

engage students in ‘hands-on’ history lessons through full-sensory virtual reality, or, in dystopian narratives, as a means of controlling populations through censorship and control. While this course took place, the provincial Ministry of Education also proposed instituting mandatory eLearning for high school students, which was a significant influence on students’ writing, and they therefore used this project as a means of articulating their own anxieties around the educational job market and their personal futures as teachers.

Concerns regarding prospective mandatory eLearning were both personal and pedagogical for participants. They were asked to build their future educational narratives based on a contemporary issue or challenge of importance to them, and many chose to explore concerns around isolation that might result from an imagined removal of physical schools entirely and consequently, the need for human teachers. In one extreme example, a student explored life on a spaceship carrying the last of humanity away from an uninhabitable Earth towards a new planet. In this imagined future, children are taught individually by artificial intelligences (‘TBots’), and only learn information necessary for the purposes of settlement. Writing from the perspective of a child on the ship, the student wrote:

> *I loved hearing about the schools. Every day I practically begged my mother to tell me stories of classrooms filled with students, and human teachers who engaged the class in discussion and activities. What I loved most was hearing about the music. After lights out my mother would quietly hum to me the tune of the only song she remembered. It was the same tune every night, but it was always hushed, always anxious, and almost always interrupted at the sound of footsteps. Music is forbidden on Genesis. Music distracts from productivity.*

While this entry nostalgically glorifies conventional schooling structures, through writing about dystopian possibility, this student also reflected on the aspects of teaching and learning that they

found central to meaningful pedagogical experiences: emotional engagement, connection, community.

Trajectories and Structures of Change

A third of students' narratives remained solely within the extrapolative realm, building directly off familiar contexts and phenomena which shaped their understanding of schooling and education. In these narratives, students dealt directly with specific policies and their impacts – such as cell phone 'bans' in schools and reliance on mobile devices – and specific pedagogical interventions were mapped onto current school systems and structures. A larger subset of the analyzed narratives mobilized a structure based on intensification, through which the increasing impact of an amplified contemporary phenomena and its implications are explored. A prominent theme in these narratives was climate change, and the impacts that global temperature increases might have along lines of mass migration, resource decimation, and living conditions locally and globally. Of all three future historiographic narrative structures, stories of intensification followed a dystopian trajectory most frequently – the question *What if 'this' continues?* in extrapolative world building became, for many pre-service teachers, *What if 'this' gets worse?* Many stories explored worsening wealth and opportunity disparities, and how systemic inequities proliferated by capitalism and racism impacted imagined children struggling within a school system that all but abandoned them. In a story about community-based school funding where entire communities have no access to opportunities if they are not already wealthy, intensifying present challenges posed by zoned schooling and strict catchment policies determining where youth attend school, one pre-service teacher reflected on the hopelessness this forces upon youth through first-person focalization:

> *But my life was different. I wasn't expected go to university. I wasn't expected to get a full time job, or have a wife, or to be able to support a family. I was never held accountable to excel in school, or taught how to dream of a better life for myself. I grew up in an area where the school I went to were with kids who grew up like me. No real family presence, no goals for academic success, and no dream to ever see life outside of our community in the city.*

Narratives of intensification, such as the excerpt above, gave students the space to amplify and better understand the implications of inequitable aspects of contemporary schooling, particularly in the local urban context in which many pre-service teachers were training. However, while well over half of analyzed student narratives featured a dystopian future, a small percentage of those students wrote about insurmountable problems. Instead, pre-service teachers wrote about the ways youth transcended oppressive contexts. In the above example, later in the story the focalized character turns towards strengthening their community with implied potential change on the horizon, emphasizing the possibility of transcending seemingly impossible obstacles.

Speculative Pedagogies and Novum Construction

The approach of constructing dystopian worlds and futures, only to trace the ways youth and their communities mobilize to push back against imagined challenges, was a common theme across many of the future educational imaginaries constructed by the teacher candidates. This was particularly true in the most extreme narratives which often followed a 'mutation' story arc, inserting an imagined and unpredictable novum into future temporal trajectories. Describing the novum, Istvan Csicsery-Ronay Jr. (2008) suggests that the "sf novum is a stone thrown into the pool of social existence, and the ripples that ensue" (2008, p. 59). Taking up the task of novum construction and tracing its impacts, a small subset of students imagined entirely different futures characterized by unpredictable disruption and explored the ways education would have to change

in response to an altered world. For many students, exploring 'mutated' worlds meant navigating the complexities of hope (Webb, 2013), where communities collectively navigated unforeseen challenges and built new, holistic views of what education might look like in contexts in and beyond the classroom.

In another example, pertinent to the contexts in which we currently find ourselves although written in late 2019, one student wrote within a world decimated by a global pandemic that kills 99% of the world's population, leaving only those with natural immunity left to rebuild. While this story was undeniably a dystopian narrative, a large portion of the storytelling focuses on a teen named Kaleb, and we are shown through his eyes the way that community was formed and learning was thought anew in response to change. In order to imagine educational change, this student constructed an entire society rooted in collective support and collaboration, where all individuals are both teachers and learners as they rebuild a world together. Narratives such as this highlight the importance of making space for storytelling which allows pre-service teachers to navigate uncertainty and unexpected change, and fosters a capacity to imagine *beyond* apocalypse and *beyond* the system as it is. The construction of a novum in these narratives characterized by profound change is of both conceptual and pedagogical significance, as it led pre-service teachers to directly address the shifting role that education might play in a changing world.

Students also connected future possibility back to their narrative roots in contemporary reality and created future narratives that were responsive to ethical and material concerns impacting society in the present. This speaks to the critical narrative pedagogical approach that Heather Greenhalgh-Spencer (2019) advocates for to ensure storytelling is responsive to the lived realities of potential others:

> There needs to be greater attention to the materiality of lived experience, as well as the ethical implications of the stories we use and the way we tell truths. There needs to be more devotion toward pointing out the ways that stories (fact, fiction, research, myths) provide a particular view of the world. (2019, p. 55)

While the narratives described above are imaginative fictions, they are nevertheless responsive to the challenges of our times, and how we might mobilize education towards a more equitable world. As one student reflected within their wiki entry, "This kind of storytelling is important because it is not a single story." This student found this work significant *because* it was an assemblage of perspectives, experiences, and resources, through which educational and societal possibility could be imagined.

Uncertainty and Temporal Distance from the Present.

While many of the narratives pre-service teachers wrote remained problematically locked within institutional paradigms of contemporary teaching and learning as exemplified through the analysis of story structure above, another element of this work involved temporal distance from the present and students' ability to speculatively navigate uncertainty. Narratives written before 2030 were disproportionately extrapolative, building directly off contemporary teaching practices. Many of these near-future imaginaries also leaned towards utopian narrative paradigms. For example, in one wiki entry a pre-service teacher explored new affordances of virtual reality in art classrooms, describing it in the following way:

> *It is currently 2029, technology is more available than ever before! We have little need for paper (there are few such resources anyway). The world of art and technology have come together. In the past, other than in mediums such as photography and design, we focused a lot on the great artists whose work was on old canvases. [...] Finally, the*

> *future is here! Not only does every student (no matter their socio-economic status) have access to computers, VR has become more available than ever. At the end of the project, we get to walk through galleries that the students have created, come to life in our very own classrooms.*

While this student implies a resource-scarcity context ("there are few such resources anyway"), they take on the voice of an imagined future-self, teaching art in a classroom fitted with accessible technologies. Although this teacher references new assessment practices and altered, but intact, conventional classrooms, this narrative is distinctly utopian. Structural change has not occurred, suggesting an extrapolative story arc, but the novum of advanced virtual reality is nevertheless a positive shift in art-based pedagogies. However, this entry also exemplifies a trend amongst near-future, extrapolative stories; a move towards utopian impulse, and a glossing over of challenges – even when referenced briefly within the story – that stem from contemporary issues (i.e. resource scarcity in underfunded art classrooms).

In contrast, the farther narratives moved from students' present moment, the more dystopian stories became. Imbued with uncertainty about what the future might hold, in most school stories in the far-future, human teachers are entirely absent, and social and physical isolation is a key theme. Many of these stories took the form of intensification narratives and focused disproportionately on increased destruction, with climate change an additional significant theme across many of these stories. In one entry taking place after 2125, a student establishes a timeline for climate destruction that accelerates exponentially following global failure to limit temperature rise beyond 1.5 °C, leading to the development of the Hive Project:

> *In the year 2031 private investors created a global fund for the Hive Project. The project reached completion in 2071 when the average global temperature was 5°C higher and*

> *climbing. Sustaining the human population became the most pressing issue uniting global leaders. The solution the Hive Project created was a series of underwater towers located in the northern and southern hemispheres. The goal of the project remains the preservation of the human race. The hope is that eventually, the earth will recover from environmental catastrophes of the 20th century. The Hive Project was populated by a lottery. Those who inhabit the Hive often refer to themselves as the lucky ones because above ground conditions became uninhabitable in the year 2125. In total, approximately 500,000 humans live underwater in the Hive Project.*

Within this dystopian context of intensified contemporary problems surrounding climate change, this student imagined how education would change in a society that only has 20 societally-mandated roles. These roles include positions like doctors, electricians, sex workers, and communications specialists, and school from ages 4-14 is solely devoted to jobs training which is done in isolation, in a 'children's section' of the Hive. While in this imagined future teachers do exist, their only role is to prepare children for the 20 approved jobs they might possibly fulfil within their lives before they turn 73, and are "dismissed" from the project. In the reflection portion of the entry, this student described her work as a criticism of late-stage capitalism. Tracing the implications of climate devastation leading to economic collapse and a desperate last attempt by private enterprise to preserve human civilization when capitalism implodes, this student wondered, in the context of education: "What is essential for our society when you strip away the facade of capitalism?" Although capitalism is undeniably more than a façade, the implication here is, importantly, that in the process of speculative storytelling this pre-service teacher began to make connections between motivations driving contemporary education in relation to the economy,

imagine beyond capitalism, and concurrently imagine what education might look like outside of capitalist paradigms.

While students like the one described above imagined the worst possible outcomes of our current contexts through critical dystopian lenses, a small subset of entries leaned into uncertainty and explored possible and radically different paths forward far into the future. Entries such as this, although fewer in number, draw the closest parallels in storytelling approach to that of the secondary students in the *Toronto 2049* project. In one entry, "Quench: A Tale of an Uncertain Future," one student imagined Earth in 2250 in which a global governmental system consisting of the corporate elite develop a device called NDEVR (Neurologically Derived Exoparaoccipital Virtual Recombinant) which was embedded in citizens' brains to avoid another "capitalist counterrevolution" like the one that occurred a century prior. The NDEVR, which only allows the host to see a constructed "hyperreality," was distributed to the wider population as an educational tool to streamline learning and facilitate apprenticeships in cyberspace. A critique of contemporary education that the student provides also acts as the justification for NDEVR as a catalyst for revolutionizing education:

> *Citizens were brainwashed through distraction. From media to other forms of consumption, immediate pleasures were a never ending source of control. Few people questioned convention. They thought that doing things as they always have, would have been alright. Education kept professing the antiquated industrialist doctrine. They promoted competition and celebrated personal gain. They embraced an environment of highly routinized systems. Young people were over-supervised and over-protected; they weren't taught the value of failure. Nor were they given any outlets for creativity and play. Ultimately, students weren't given the opportunity to discover their own gifts. Many lost*

> *touch with the most significant feature of the human species: creativity. Yet, the system kept pumping students out into the world.*

Written in the liminal space between frustrations with current industrial models of education and techno-deterministic, capital-driven learning under the disguise of innovation, the latter half of the wiki entry tells the story of Leonardo, a teen with a "rebellious streak" who ventures into a community that rejected the NDEVR, and who represents pedagogical hope within community. Although it is never made clear what the alternative is exactly, Leonardo comes up with a plan; under his parents' strict watch, he will unavoidably accept the NDEVR, and then deactivate the device by temporarily losing consciousness, diving deep below the ocean's depths. While the world this student imagined is undoubtedly dystopian, the wiki entry ends with a link to a Twine (twinery.org) extension, an interactive story platform where the reader of the wiki entry can make decisions about what Leonardo does next after his NDEVR deactivation. The user plays through scenes of community education, building homes for displaced dissenters while learning about life on the fringes of society. Importantly, the user moves with Leonardo towards dismantling the NDEVR system, only for the playable story to end just before the resolution. This student chose to maintain uncertainty within his narrative, hinting at hope in educational and future possibility just beyond the narrative frame. In the few examples like this, that blend narrative structure and genre orientation built on questions about the purpose and trajectory of education, the uncertainty of unexpected possibility was not a barrier to hope, but rather a catalyst for hopeful, if hesitant, (re)imaginings about how education, and teachers, might respond in dynamic ways to change.

Catalyzing Pedagogical Exploration

Giving space for pre-service teachers to imagine possible educational futures in the context of potential societal change allowed them the opportunity to begin viewing education *as*

changeable, in contrast with views that there is a 'right' way to learn and teach. And while structural shifts in education are often slow and imposed from above by governmental bodies, and potentially perpetuated by educators who cling to established systems and structures as exemplified by the number of pre-service teachers who engaged in more shallow extrapolation, speculative storytelling in this way can also provide an opportunity for pre-service teachers to imagine for themselves how change might occur, and what impacts that might have on their own pedagogies. Speaking to this, one student described how this task was "a form of inquiry-based learning, except the inquiry was in [their] imagination," and helped them develop their "'voice' in telling a story about what one future of education could look like." This idea of developing 'voice' was central in many of the reflection sections in students' wikis, and also connected with them further developing pedagogical orientations towards their teachable subjects. Across subjects like history, art, technological education, and science, many students used this narrative exercise as an opportunity to address issues that they had noticed during teaching placements or, in some instances, had experienced when they were in school. One history pre-service teacher imagined how virtual reality might support a more honest representation of history, specifically in the context of Canadian history and residential schooling. Another student imagined a construction class entirely focused on community apprenticeships, through which students would build houses for newcomers displaced due to climate change, and learn about flood-resistant building materials in an environmentally altered world alongside experts in the field. Stories such as this pushed pre-service teachers to reflect on what mattered to them in their own educational experiences, and expand upon what is possible beyond current teaching contexts.

This exercise also encouraged many participants to be self-critical regarding their own educational experiences and subsequent biases. By having to build a world and take on an identity

and write from within it, some students reflected on how they had to address the inequitable nature of contemporary schooling practices. In response to a question asking them to reflect on what was most challenging about this process, one student described their thought process:

> The biggest challenge I faced in imagining this future was imagining how to make the educational community bigger. I experienced a very traditional style of education so I had to really look at different curriculum documents, academic articles and the stories of other people, as well as observe my school placement, to even begin to think about how to increase the variety of resources available to students and teachers. I had to move past the fact that traditional education may not be the best process. In my eyes, the traditional classroom worked well because that's how I learned and I succeeded. The challenge was moving away from this perspective, and I'm coming to realize that community is important in education.

As suggested above, telling a story about the future of education is a complicated process; one that weaves together past experiences, present challenges and fears, and hopes for the future. Importantly, this approach made space for students to work through those interrelated elements in the context of their own anxieties about becoming teachers, at a difficult time for the profession and society writ large. Anticipating a provincial teachers' strike (Rocca, 2020), the aforementioned mandatory math examinations as a condition for teacher certification, proposed online learning requirements for secondary students, and declining public support of educators, students also valued being able to work through the difficult reality of teaching in a transitional moment in history.

Conclusion: Figured Futures of Teaching and Learning

> *Looking forward is important for us because our future is a gamble. We should always be prepared to face issues or challenges that may arise. It is important to progress as a society, especially in schooling. We know that changes will come but we must be able to have mechanisms in place to adapt and embrace (or resist) change.*
>
> "Adding Tech to Learn French as a Second Language" (Reflection, Wiki Entry)

The future imaginaries explored here by students were written before the pandemic. And yet the event of the pandemic informs new understandings of this work as, "[…] fictional worlds are not just figments of a person's imagination; they circulate and exist independently of us and can be called up, accessed, and explored when needed" (Dunne & Raby, 2013, p. 71). I therefore draw upon these narratives to emphasize the enduring importance of envisioning, storying, and working towards changing our shared futures. In conducting this study I find pre-service teachers can play an immense role in supporting students to imagine possibility in and beyond education through speculation and speculative pedagogies. As Matthew J. Wolf-Meyer (2019) states:

> The future is unfathomable. But in this openness, it becomes a space to play with theories of what might be, of what the future holds, and how it will reshape human lives and society, and how the future will change too. […] Speculative fiction – and social theory – that considers desolation and its aftermaths helps to point to ways forward, ways to live through the apocalypse, even if living through doesn't manage to keep things the same as they were. (p. 15)

Given the signaled importance of imagining what might exist beyond calamity and the purpose that speculative narratives can serve in this endeavour, embedding futures-oriented educational narratives into teacher education is a crucial opportunity to make space for stories and pedagogies that are responsive to our changing and changed world.

Conclusion: Speculative Pedagogies, Figured Futures, and Uncertain Imagining

> We have indeed always been interested in the future. Where are we going? What will be awaiting us when we arrive? Notice the plural pronoun: we. You and I.
>
> Michael Pinsky, *Future Present: Ethics and/as Science Fiction* (2003, p. 11)

In the final chapter of this dissertation, I return to the above quotation from Michael Pinsky's (2003) *Future Present: Ethics and/as Science Fiction*. Pinsky's words are ones that I often turned to while writing this dissertation, as it reinforces the necessarily collective nature of the future. Certainly, as our worst dystopian impulses and fears are arguably realized, the emphasis that Pinsky places on collective imagining is increasingly essential; if we continue along our current trajectory, with deeply entrenched individualism and alienation at the heart of contemporary existence, it is likely that we will not have a future to be interested in, to move towards, to arrive in, to imagine, or to catalyze speculative possibility of any kind. It is with this in mind that I conclude by framing the findings of this research through the concept of speculative pedagogies. As I find through completing this study, speculative pedagogies can mobilize future-oriented imagining in myriad educational contexts towards uncertainty through approaches that allow the future space to be an open question instead of a predetermined temporal site of present continuance. This research explored several areas of central concern, including the engagement of science fictional world building towards the imagined futures of secondary students and pre-service teachers. Through modes of science fictional reading and writing participants investigate the possibilities of speculative, narrative orientations towards future. My study gives insight on how these SF literacies and literature might open up space for different kinds of conversations about the future—individual futures, collective futures, pedagogical futures—in educational spaces wherein discussions of the future are either alienating in their fixation on certainty, preparedness, and individual success, or are entirely absent. Through making space to re-read, re-

write, and re-story figured futures, or the narrative assumptions through which we might act towards future possibility, this research finds that speculative world building in conjunction with collaborative or relational storytelling can also, and radically, reorient *who* gets to story the future.

Overview

In this chapter, I will summarize both stages of this research through weaving threads of speculative pedagogy into a retelling of the major findings of this study. Of critical importance to this dissertation is further reinforcing the way engagement with science fiction (SF), in conjunction with world building and speculative storytelling, catalyzed for participants new orientations towards future possibility in ways that sought not to eliminate uncertainty, but rather explore the contours of myriad potentialities. The findings across both stages echo Esther Priyadharshini's (2019) work on the importance of futures talk detailed in her article "Anticipating the apocalypse: Monstrous educational futures," in which she problematizes "anticipatory regimes" (p. 1) of education in relation to the future in the following way:

> Conversations with youth can be circumscribed by what appears on the immediate horizon and practices confined to pragmatic and programmable decisions about the tomorrow. When the *telos* of education is interpreted as improving academic grades and employability, conversations with young people can be confined to exhortations to aspire better/greater, to maximize grades, improve employability skills, choose appropriate subjects and get employment ready. Futures talk is thus often conducted in a distinctive aspirational, yet pragmatic register where the emphasis is on being 'realistic', and on focusing on tangible actions and programmes. (p.1)

Priyadharshini criticizes the way that futures talk often forecloses upon more dynamic approaches to the future in favour of pragmatic, preparation-based treatments of the future in schools. Drawing

from dystopian narratives specifically, she engages in a series of futures talks and workshops with a group of secondary students and subsequently seeks out young people's interpretations of future possibility that depart "from the mainstream narratives of futures talk within schooling" (2019, p. 2) as they engaged in open, dialogic speculation.

Particularly in the context of my first research question from stage one – *What are students' thoughts on the future, including their hopes, fears, and approaches to planning for the future, and how is the future explored in schools?* – Priyadharshini's findings parallel many of the fears, anxieties, and hopes that the secondary students I worked with expressed: fears regarding "irreconcilable divisions in society" (2019, p. 4); a dwindling belief in the stability of contemporary society and the perceived security it claims to afford; an imagined need to find ways to survive within anticipated collapse and find meaning in meaninglessness; and simultaneous hope and excitement found in the uncertain but infinitely open potential of future change. In analyzing the content of her narrative discussions with participants, Priyadharshini highlights that "the negativity of the monstrous in young people's narratives was entangled with more positive affect" (2019, p. 6). Taking both this work and my own into account, the complex interweaving of hope and fear is an overarching and significant sentiment that is often given no space in classrooms. This dissertation therefore also examines the impact of dismantling the binaries of hope/fear and dystopia/utopia, and further calls into question the assumption that the destruction of human society as it is now would *only* result in further horrors. As I will detail below, while many of the participants from both stages of this research feared the convergence of multiple, anticipated forms of social and existential collapse, some students also found tentative hope in what might follow in its wake. I will then conclude this chapter by detailing limitations of this research and identifying opportunities for further work in this area.

Revisiting *Toronto 2049*

The first stage of this research, occurring over the span of three months working with one secondary English class, involved exploring SF and science fictional storytelling structures with students and then utilizing those storytelling approaches towards imagining the future of Toronto, the city in which this research took place. Over the last five weeks of the study, students co-constructed the *Toronto 2049* world building project, which was facilitated through collaboration meetings wherein students navigated their individual and collective hopes for and fears about preferred, possible, and probable futures based on their understandings and experiences in the present. A class wikimedia platform became a catalogue for students' varied and interwoven imaginings as they outlined a broad structure for the future they built, established a historical and social timeline of significant events which would shape culture and community in the future, and created characters and took on perspectives from within their created future in first-person narratives written from within the world. The world building project facilitated my exploration of my second and third stage one research questions: (b) *How does student disposition towards the future affect their sense of agency and active engagement with issues in the present*? and (c) *How can science fictional world building facilitate students' engagement in democratic, collective decision making about the future, without foreclosing on the concept of uncertainty, and a plurality of perspectives and possibilities?* In the context of these two questions, students' narrative work allowed them to express their feelings about both present society and possible futures in different ways, and also critically reflect on their own sense of agency within the present that allows them to either move towards or away from the futures they envisioned. A central aspect of this research involved considering how collaborative, speculative storytelling might serve as a way of 'staging' dissensus (Biesta, 2012). Accordingly, in this project students not only had to grapple with their

differing hopes and fears for the future, but they also simultaneously began to see the future as a social project imbued with publicness. In contexts which so often favour the individual, students were faced with the challenge of the *collective* building of a world. Further, and as will be detailed below, students also resisted falling into genre tropes as a result of this complex, collaborative imaginative process, echoing in many ways Tom Moylan's (2021) call for resistance against pervasive narratives of purely dystopian ruin:

> [...] what is needed is not a one-dimensional black mirror that turns in on itself but rather a prismatic utopian optic that can break through this provincial temporality and open people to a range of possibilities out of which critical and transformative visions and practices can emerge. (p. 3).

While I do not define this work as either distinctly utopian or dystopian, students' storywork nevertheless involved navigating the liminal space between hope and fear, which were further complicated by their experiences being inundated by images of dystopian societal collapse in the media and their simultaneous skepticism of utopian possibility. Importantly, the collaborative *process* of telling a story together allowed students the conceptual space to form new figured worlds and figured futures in which they were not helpless and did not have to resign themselves to merely, to quote a student, "take [the future] as it comes."

Making Space for Surprise in Collaborative Learning

Tracing findings across student reflections on the world building process and the closing interview with the participating teacher, one unanticipated but significant finding is the emergence of surprise within the project, attributed in many ways to what the teacher termed as the process of "letting go" pedagogically that allowed students to take their storyworld in the direction they wanted it to go. In the interview, the teacher expressed multiple times how surprised she was at

how positive the future Toronto that students envisioned was overall, particularly given the prevalence of dystopian narratives in both popular culture broadly and young adult literature specifically. As indicated in students' reflections, this was partly because the world building process allowed them to work through issues and topics that mattered to them personally. Returning to the topic of the economy in the final group interview for the study, students reflected on the importance of being able to collectively tackle issues like the economy, healthcare, and equity, in terms of how the project resonated with their lived experiences:

> **Ivy B.:** I like thinking about how money might not be such a stressful thing for us anymore, which I feel like it could be possible that money might not have as much value in the future so that people could live with less of it without having to... [trails off]
> **Zad W.:** Without dying because they don't have enough of it to live.

Students also found the process of making difficult decisions together to be an important part of the experience:

> **Jeffree F.:** It makes us all, you know, talk to each other, and explore different ideas and stuff. And it's good to hear, to be able to socialize and be mature, and even if you disagree to like, try to figure out a way and communicate around that. [long pause] …there's a lot of people who are like, people I saw in the beginning and in the end, their opinion is completely different now. It's good to have that kind of openness, be open-minded to listening and getting to understand why.

Beyond students' shifting of worldviews through exposure to others' unique perspectives on both present and future society, the world building project also gave them a platform to work through their complicated feelings of hope and fear:

> **Ivy B.:** I think people often have a lot of hopelessness for the future and I don't blame them. I used to think like that all the time. I used to think like, 'oh my god, what is the point? Where are we going?' And I kind of got sick of that. I got so sick of just hearing myself talk down on everything, thinking everything was going to hell. And I just like to think that maybe, just maybe, something good is going to happen. It [this project] was a breath of fresh air, because I used to hate thinking about it [the future]. I thought everything was just going to die a horrible death, so...[trails off]
> **Zad W.:** Yeah, it's kind of nice to have a hopeful outlook on the future other than like, looking at the news and saying, 'hey, yeah, you're gunna die in… [long pause] 12 years.'
> **Alyssa M.:** I was so happy it wasn't a dystopia. I thought we were gunna design the

saddest world ever. I'm glad that didn't happen. I'm surprised.

Students' reflections on the world building project as an antidote for hopelessness and helplessness were significant, but their expressed surprise at the trajectory of the project as a collective endeavour is also worth noting. The collaborative aspect of students' future-oriented storytelling allowed for the project to surprise them as they actively participated in constructing their own learning experience through narrative and discussion. As students listened and read together, worked and wrote together, and discussed and imagined together, they also had an opportunity to deepen their sense of community around a complicated kind of hope for the future. In the context of hope, the findings of this study speak not only to the ways that science fictional storytelling and world building can be used to build community and combat fear with hope in an age of existential upheaval, but also highlight the importance of embracing opportunities for students to be surprised by their own learning.

Speculative Futures of Teaching and Learning

In stage two of this research, I built on the SF and world building work that I did with secondary students to create an assignment for use in pre-service teacher education that similarly mobilized speculative storytelling towards future imagining. This assignment was framed by three additional research questions:

(a) How do post-secondary education students' and teacher candidates' interactions with science fiction and science fictional world building influence their pedagogical beliefs and thoughts on education?

(b) How does exposure to science fiction and purposeful envisioning of the future inspire a rethinking of possible pedagogies, educational structures, and teaching methods?

(c) In what way does exposure to pedagogies that teach towards future uncertainty influence students' own dispositions towards uncertainty in their teaching practice?

Through these questions, I sought to examine the impact of SF on teacher candidates' pedagogical beliefs, their ability to rethink and reimagine educational systems, structures, and approaches, and their disposition towards uncertainty in their own teaching practice. Accordingly, the designed assignment required pre-service teachers to use science fictional storytelling to imagine the future of education and subsequently write from within the future worlds they created. Structured through a wikimedia platform that allowed pre-service teachers to share their storyworlds and explore the contributions of others, a central aspect of this assignment involved practices of listening—to peers, to associate teachers, to popular media that engages with the future—in order to form increasingly varied and nuanced futures in which they might explore new educational possibilities.

Analyzed thematically through various narrative frameworks including the spectrum of utopia/dystopia, preferred/possible/probable futures (Bell, 1998), and extrapolated, intensified, and mutated narrative arcs (Wolf-Meyer, 2019), pre-service teachers' narrative worlds were widely varied. While some remained firmly within the extrapolative realm through imagining futures that brought present educational contexts into the future with little structural change, others drew from contemporary challenges and concerns to ask important questions about the consequences of current educational policy, the changing nature of education in an age characterized by technological innovation and eLearning, and how the nature of schooling might change in light of societal and existential issues like systemic racism and climate change. At the far end of the spectrum, other pre-service teachers chose to write within mutated narratives wherein a 'mutation event' (i.e. a pandemic, the earth becoming uninhabitable due to a climate-driven catastrophic weather event) has occurred, after which life—including education—must be

rethought completely anew. It is within stories such as these that the impact of speculation in teacher education might be seen most profoundly; for pre-service teachers who wrote of educational futures vastly different from our own, this assignment allowed them to ask fundamental questions about the *purpose* of school, and of education, and push the boundaries of what might be pedagogically intelligible in changing times. However, regardless of narrative approach, all analyzed stories allowed pre-service teachers the opportunity to critically engage with contemporary issues of concern to them as they developed their identities as teachers in a context that so often focuses on how things within education are, instead of how education might change. Inhabiting the liminal space between understanding the present contexts of education and imagining education anew, this assignment allowed pre-service teachers to question narrow, often prescribed notions of what it means to effectively learn and teach, as well as who gets to impact trajectories of educational transformation.

Limitations of Research

Given the nature of in-school, qualitative, and narrative research, one significant limitation to stage one of this research is that the results are not broadly applicable to every group engaging in collaborative, speculative storytelling work. Further, it is not possible to replicate study results exactly, especially given the contextually situated nature of storytelling. However, while exact replicability is not necessarily an expectation in qualitative research, and particularly in exploratory research, there are further circumstances within this study that make the findings particularly unique to the research context. Most significantly, this research took place in an urban alternative school within an arts-based social justice-oriented program. This means that, while students faced other challenges (i.e. attendance, familial and social challenges) which impacted some participants' ongoing involvement in the study, it also means that the students who could

commit to the project consistently were personally motivated and eager to participate in narratively redrawing the parameters of social life; in part because of their conceptual positioning within a social justice program, and in part because many students had been negatively impacted by various social structures and oppressive systems which influenced their desire to imagine the future differently. At the same time, this also means that the participant pool was widely inconsistent; the nature of the school meant that students participated when they could. This kind of work in other programs, including mainstream public classrooms and in community-based contexts, therefore needs to be done to better understand the broad-reaching efficacy of futures-based world building work on student learning and the development of nuanced dispositions towards future change beyond the hope/fear binary. This research represents a singular experience and would need to be run across a range of contexts before specific curricular or policy changes could be suggested. However, findings from this study nevertheless reinforce the established need to rethink the position of the future within curricular planning, particularly regarding how uncertainty and collective futures are addressed, and students' hopes and fears towards the future are given space in formal learning contexts.

From a pedagogical perspective, the length of the study was also a limiting factor. Although a three-month in-school study constitutes almost an entire semester, the participating teacher in the closing interview said that she wished there had been more time for longer discussions when engaging with SF in the classroom, as well as more time for students to further develop their world building ideas. Relatedly, the fact that this study, and specifically the world building project, had to occur within the framing of the current English curriculum was a limitation that prompts further questions: what might a world building project look like unencumbered by a need to attribute grades to student contributions? Further, what might a project like this look like in-community,

linked to political and social action catalyzed by students' speculative storytelling? Would this further the aims of helping students build emergent identities as agents of present change? While thinking *is* a form of action, this work remained a narrative and conceptual exercise.

Similarly, in the second stage of research, and specifically within the context of teacher education, assignments such as the one described in chapter seven also had to accommodate the professional nature of teacher certification programs and the demands of teacher education courses. Anecdotally, teacher candidates routinely express being overwhelmed by the task of balancing coursework and teaching placements in addition to often ignored personal circumstances, such as many pre-service teachers' familial obligations and part- or even full-time employment outside of their teacher education programs. With limited time to dedicate to in-class collaborative world building work, projects such as this are often necessarily pared down when working within the confines of teacher education and keeping in mind the various challenges pre-service teachers face. As a result, this world building assignment was embedded within a course portfolio project instead of facilitated as a dedicated, longer exploration. It was structured as an individual assignment with listening and otherwise engaging with the stories of others as the collaborative component. This contrasts with the first stage of this research, which was designed to prioritize the collaborative storytelling process within the world building project design. In subsequent iterations of the new media literacies class, the other course director, who concurrently taught the other section of this course alongside me and whose course section generated some of the student assignments analyzed in this dissertation, has adapted the described world building assignment to be used as a group project over time throughout the class. This suggests that approaching world building collaboratively in teacher education is possible and presents a fruitful

opportunity for future research. However, this remains a limitation within the data set which I report on in this dissertation.

Recommendations for Future Research

Throughout this research I have problematized the ways curricula so often positions the future in relation to preparedness, skills-based learning oriented towards competition, and individual success within capitalist paradigms. While speculative storytelling, such as the work described here, presents an important opportunity to shift how we approach the future in schools, it is but one approach. Further research is sorely needed both within the context of secondary English classrooms and in other subjects, grade levels, and schooling policies writ large to explore other opportunities to adopt expansive, speculative pedagogies in students' learning experiences. Speculative pedagogical orientations that move beyond merely teaching what *is* and reinforcing present and often exclusionary systems and structures towards what *could be* is of critical importance; especially in contexts where knowledge is increasingly networked and made accessible in a range of ways for students, and in which change occurs so quickly that likely the future that educational institutions are preparing students for will not look even remotely like the present in which they are learning.

Specifically drawing from the collaborative approach taken in the first stage of this research working with the participating teacher, this kind of speculative pedagogical orientation also signals a need for support systems for teachers engaging in this kind of work. Research that focuses on how to build teachers' capacities towards speculative pedagogy, whether mobilizing SF and world building directly or not, is also a crucial area for future exploration. Building from the work explored in this dissertation, I conducted a small-scale professional development study with teachers on the use of SF and world building across subjects, and the findings from that study

reinforced the importance of providing materials, resources, and support for practicing educators seeking opportunities to embed speculation and speculative materials into their teaching. This extends to stage two of this research, and speculative approaches to pre-service teacher education; here too, more research is sorely needed on how teacher candidates are thinking about the future of education and their agential ability to impact educational systems and structures. Expanding on this and the largely shallow and extrapolative storytelling of many participants in stage two, further research on how speculative storytelling might further help teachers and teacher candidates enact pedagogical change in schools is also an important point of inquiry: how can speculative storytelling and world building catalyze deeper reimagining of contemporary educational practices towards open-ended, community-engaged pedagogies that resist merely recreating the extrapolated present? Given the dearth of research at the intersection of SF, pedagogy, and teacher education, this is also a fruitful area in need of further consideration. However, taking a broad look at what this dissertation offers, tracing the potential impacts of speculative ways of thinking, teaching, learning, and living collectively towards uncertain futures, particularly within curricular, educational, and institutional policy is also critical; especially as we anticipate continued uncertainty and accelerated change, addressing the belated nature of education will become increasingly important in times of crisis and flux.

Building and Living Within Uncertain Futures

Then we buried our dead and we planted oak trees.

Octavia E. Butler, *Parable of the Sower* (1993; 2007, p. 328)

The first book in Octavia E. Butler's *Parable* series is told through journal entries by a 15-year-old girl named Lauren, an empath who feels the pain of others as a result of her mother's drug use while she was pregnant, and who lives in a walled community struggling to survive amidst

water shortages, rampant violence, and government abandonment. The novel, tracing the complicated intersections of race, poverty, and gender against the backdrop of Lauren's own inability to ignore the suffering of others, begins in 2024—now a profoundly near-future novel for present readers—and follows Lauren as she is forced to leave her decimated community burnt to the ground in a fire, build kin with wandering strangers, and find a new sense of home both conceptually through her developing faith in a religion she has founded called Earthseed, and materially in a lush clearing somewhere in northern California. Amidst strangers, Lauren finds a new home within liminal spaces. The place she settles, called Acorn, exists remotely, far from any major through-ways, but also embodies the in-between in other ways: between dystopia and utopia, hope and fear, known and unknown, life and death. In the first novel, Acorn is at once a space of growth, community, struggle, sadness, and hope; a small patch of land in an otherwise scorched earth, containing both their dead and a hesitant hope of survival. Lauren, and her kin, find hope in something *other*, something unexpected, and something none of them could have imagined. A place to settle in a world they thought would demand they wander forever, only made possible because they committed to live and build anew *together*.

There is perhaps surprisingly little mention in this dissertation of the fictive futures and worlds that brought me to this research, and of the hope I found as a child engaging with the expansive future worlds of SF that so boldly presented other worlds and other futures as *real and possible*. But the traces of these stories are found everywhere in this research, most notably in my approach to SF, not as a narrowly defined genre of tropes and strict adherence to the 'hard' sciences necessarily, but rather as a speculative disposition towards possibility explored through narrative. Donna Haraway in *Staying with the Trouble: Making Kin in the Cthulucene* (2016) traces the complex "webs of speculative fabulation, speculative feminism, science fiction, and science fact,"

and argues that it "matters which stories tell stories, which concepts think concepts. Mathematically, visually, and narratively, it matters which figures figure figures, which systems systematize systems" (p. 101). In a later article titled "It Matters What Stories Tell Stories; It Matters Whose Stories Tell Stories" (2019) in which Haraway expands on the concept of compost stories as "writing-with in layered composing and decomposing" (p. 565) that roots situated storytelling in the slow inhale and exhale of earthly and embodied change, life, and death, Haraway characterizes stories as nesting Russian dolls. For her, "stories nest like Russian dolls inside ever more stories and ramify like fungal webs throwing out ever more sticky threads" (2019, p. 565). Drawing from this way of thinking about both SF and storytelling more broadly, in this dissertation I have explored myriad stories: those that the students in the *Toronto 2049* project told collaboratively, navigating dissensus as they did towards envisioning a collective future; secondary students' own stories of hope and fear in relation to the future; and the various imagined pedagogical futures that pre-service teachers imagined as they mobilized SF storytelling and world building approaches towards envisioning educational difference.

Significantly, however, and following the thread of Haraway's Russian nesting dolls, curricula can also be seen as a story that tells certain stories, and determines *whose* stories are told, listened to, and given space in classrooms. Overarching expectations surrounding teacher education and how pre-service teachers *ought* to embody their emerging identities as educators are also stories; figured worlds through which teacher candidates learn 'how it is' and rarely how things *could be.* The speculative stories shared here, of a future city and educational futures, therefore nest within the larger Russian doll of institutional narratives of a curricular, social kind, and must be seen in tension with these imposed narratives placed on participants. But aligned with Haraway's belief that "we must change the story; the story must change" (Haraway, 2016, p. 40),

in this dissertation I have argued that it is imperative to find ways to make space for new dispositions towards the future, uncertainty, and possibility, that draw strength and inspiration from collective imaginaries in contrast with the proliferated individual notions of success and continuance that permeate society. Just as Haraway argues through exploring the interconnected biological narratives of mushrooms, crocheted coral reefs, birds, and root systems, so too does this work acknowledge that we "have always been a loopy *we* of many surprising interlinked kinds" (2019, p. 567). Taking on a speculative pedagogical approach that privileges interconnected *becoming* opens space within education for freely imagining together; a critical opportunity as we teeter ever-precariously on the edge of uncertain futures.

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Appendix A

Stage One Introductory Written Response Questions

Students completed a short, written questionnaire prior to study commencement, following completion of consent processes. Thirteen student participants answered question 1, 12 answered question 2, and 12 answered question 3, with one student completing the questionnaire with transcription support from the participating teacher.

1. When you think about the future, what do you think of? Do you think about your individual future, or the future of society?
2. What helps form your opinion of the future? Examples could include how the future is discussed in school, the media, movies/documentaries/books, etc., your family, and other influences.
3. What are you doing to prepare for the future? Do you feel responsible for the future? Why or why not?

Appendix B

Stage One Interview Questions

Stage one of this study included three group interviews, conducted in a circle formation in the centre of the classroom and supported through audio recording and notetaking. Questions were printed out for students, in addition to a PowerPoint with the interview questions. These questions correspond to the interviews describe in Table 4.1 of this dissertation. Original interview questions were collaboratively workshopped with the participating teacher prior to each interview, and interview processes were co-constructed alongside the teacher based on her understanding of students' needs and comfort levels regarding in-group discussion, in addition to topics and discussions that students gravitated towards within the study. Where questions were reframed for understanding during the interview, the reframed question has been provided.

Interview 1: Engaging with General Themes of the Study. *April 1, 2019.* (11 participants)

Keywords/Concepts: *Collaborative learning, science fiction, the future and future studies, the future in education, democracy and the future*

Think/pair/share prior to the first interview, advocated for by the participating teacher:

> "Before we begin, take 5 minutes to discuss with another student/a couple of other students your thoughts on the following questions in preparation for the study: What are your feelings about the future right now? Do you think about the future? Why or why not?"

Topic 1: The future in school

> How do you think the future is approached in school?
> Do you feel school has prepared you for the future? If not, what do you think you would like to learn?

Topic 2: Your feelings about the future

> What are you excited for with regards to the future?
> What type of things concern you?
> *Reframed:* What are you looking forward to in the future? Are there things you are worried about?

Topic 3: Media addressing the future

What types of media can you think of that openly engage with the concept of the future? How is it usually discussed? How do you feel about this?
Reframed: How do different types of media typically talk about the future? What do you think about this?

Topic 4: Science fiction and the future

What do you think about how science fiction represents the future?
Why do you think certain kinds of representations are so common?
What do you think about this?
Can you think of any examples?
Reframed: How do you feel about how science fiction media explores the topic of the future?

Topic 5: Media and change in the present

Are there any examples of media or other influences you have engaged with that make you want to change the way the world is now?
How do representations of the future factor into this feeling?
Reframed: Does media impact how you think about what you could do to change things that concern you? Does media that specifically addresses the future impact your thinking about the future?

Topic 6: Making change

How do you think about change, and how change could take place in the present?
Reframed: Do you try to play an active role in changing things that concern you in the present? If so, how do you do that?

Interview 2: Reflecting on Science Fiction. *April 30, 2019.* (10 participants)

Keywords/Concepts: *Science fiction, popular media, storytelling, the relationship between the present and the future, future imaginaries, varying media forms and storytelling, narrative as thought process*

Topic 1: Your thoughts on science fiction

Thinking back to before the unit, has your opinion on how the future is engaged with in science fiction changed? What did you think about the future and science fiction texts before the unit?

Topic 2: Dystopia

Many representations of the future in science fiction are dystopian (stories which imagine society falling apart). Why do you think this is? Do you think this is a positive or a negative thing? Why?
Reframed: Why do you think we tell more stories of society ‘falling apart’ than stories where contemporary problems have been solved already?

Topic 3: Shifting perspectives on the future

Do you think reading and engaging with media that explores fictional futures can change how we think about the future? Why or why not?
If so, can you give an example of a text which has changed how you think about the future?

Topic 4: Shifting how we think about the present

Do you think reading and engaging with media that explores fictional futures can change how we think about the present? Why or why not?
If so, can you give an example of a text which has changed how you think about the present?

Topic 5: Science fiction and society

Science fiction is increasing in popularity in many creative industries (literature, movies, video games, art, etc.). Why do you think this might be?

Topic 6: Anticipating the world building project

Based on what you know about science fiction now, what do you think some of the challenges will be of imagining a future Toronto together?

Interview 3: Reflecting on the World Building Process. *June 3, 2019.* (7 participants)

Keywords/Concepts: *Democracy, collaboration, digital storytelling, creative writing, creative process, future imaginaries, disagreement, preferred futures, anticipated futures, action, change*

Topic 1: Process and challenges

In the last interview I asked you what challenges you anticipated throughout the world building project. Having just completed the project, what challenges did you experience? Were you challenged by things you thought would be difficult? Did anything surprise you?
Broken down: What was difficult about the project? Were you surprised by the things that were challenging or difficult? What helped you over come these obstacles?

Topic 2: Process and the challenge of collaboration

Were there significant disagreements in the class regarding the direction the project should go in? How did you deal with these disagreements?
Reframed: What was the process of collaboration like? How do you feel about the meeting structure? What aspects were helpful? What could have been done differently?

Topic 3: Content and choices

Reflecting on the project, what did you choose to explore with regards to the future? Was your focus something you are personally interested in? How did you find inspiration to write about the aspect of the ‘world’ that you chose?
Broken down: What did you do your wiki entries on? How did you choose what to write about? What made you decide to write about what you did?

Topic 4: Reflecting on the project

Do you think creative projects like the world building project are useful when thinking about the future? What was useful or interesting for you?
Reframed: What purpose do you think a project like this serves? What can be learned from world building?

Topic 5: Addressing the future in schools

How did this project differ from how you have engaged with the concept of the future in school before?

Topic 6: Process and challenges

Has the world building project changed how you think and feel about present day Toronto? Do you have a better sense of the future you want to see, or a stronger understanding of issues you are concerned about/concerns you have in a way that differs from the things you were worried about before?
Reframed: Has the world building project changed how you think about contemporary issues you think about? Did it change how you think about the future? Did you learn anything that changes your views on present issues and the way the future might be?

Appendix C

Stage One Supplemental Teacher Interview

Objective: To provide an opportunity for the participating teacher to share their perspective and experiences throughout the study, and to establish a more holistic view of the study/curricular design process as it pertains to the participatory action research-informed, reflexive ethnographic methodology utilized in the study.

General Impressions

1. Thinking back to when we first began designing the science fiction unit and the world building project which informs the study, what were your initial thoughts about the project? What were your concerns? What were you looking forward to?

2. Now that the study is over, what is your general impression of the study? Did it go the way you thought it would? Did the concerns you had prior to the study materialize throughout the study, or did new concerns emerge?

3. Did anything throughout the study surprise you?

Reflecting on process

4. Reflecting further on challenges that emerged throughout the study, how were they addressed? Are there things (moments, interactions, issues) you feel were left unresolved that might require further contemplation/acknowledgement?

5. What is your general impression of the collaborative process we engaged in, co-designing and co-teaching the science fiction unit and the world building project? Is there anything significant you learned from the experience, or anything you wish had been done differently to further supplement the experience as a form of professional development?

6. What was your experience like as a teacher taking part in an academic study?

Focussing on Specifics

7. Reflecting on the study, what was your experience teaching with a focus on genre, particularly science fiction? How did you perceive students' learning experiences throughout their engagement with science fiction? What would you have done differently in this part of the study? What might you use again in your future teaching?

8. In your position as a teacher moderator, what was your experience throughout the world building project? How did you perceive students' experiences throughout the project? What would you have done differently in this part of the study? What might you use again in your future teaching from this part of the study?

Appendix D

Stage One Unit Plan Submitted to External Research Review Committee of Participating School Board (Original Dates)

Unit Title: Exploring Science Fiction and the Future (and The World Building Project)
Grade: ENG3/4U*****

Time: 10 classes (approx. 70 min. each) - 700 minutes (Part 1 - Science Fiction Unit)
17 classes (approx. 70 min. each) - 1,190 minutes (Part 2 - The World Building Project)

Unit Summary: In this two-part unit, students will explore science fiction (SF) as a genre through stylistic devices such as world building and extrapolation to make connections between the futures depicted in texts with contemporary issues in the present. A range of SF resources in different mediums (short stories, novels, video games, tv shows, movies) will be made accessible to students so they can engage with the genre in ways that interest them. Both collaborative and independent exploration will feature in this part of the unit.

In the second part of the unit, students will engage in the world building project. Students will learn about world building as a writing process SF authors/creators engage in, and will then learn how to use collaborative digital tools. A series of three 'planning' sessions will occur, during which students will use what they learned about SF and world building to collectively work through the details of the future Toronto they are imagining, with work periods in between for students to 'fill in' the world. Assessments will take the form of a SF inventory of resources students engaged with (RL), written contributions to the digital map and wiki entries (W and MS), and verbal contributions during the collective planning sessions (OC).

*****Given the nature of the alternative school in which I am proposing to do this study, the grade 11 and 12 *Ontario Curriculum for English* will be used as a guide. However, in this class students grades 10-12 across streams will be present, so modifications based on student needs (specified in students' IEPs or otherwise necessary) will be made in collaboration with the participating teacher.

Learning Expectations: Curriculum Expectations (taken from ENG4U)

Oral Communication (OC)

1. **Listening to Understand:** listen in order to understand and respond appropriately in a variety of situations for a variety of purposes;
2. **Speaking to Communicate:** use speaking skills and strategies appropriately to communicate with different audiences for a variety of purposes

Purpose 1.1 identify the purpose of a wide range of listening tasks and set goals for specific task;

Using Active Listening Strategies 1.2 select and use the most appropriate active

listening strategies when participating in a wide range of situations;

Extending Understanding of Texts 1.6 extend understanding of oral texts, including complex and challenging texts, by making insightful connections between the ideas in themand personal knowledge, experience, and insights; other texts; and the world around them.

Purpose 2.1 communicate orally for a wide range of purposes, using language effective for the intended audience;

Interpersonal Speaking Strategies 2.2 demonstrate an understanding of a variety of interpersonal speaking strategies and adapt them to suit the purpose, situation, and audience, exhibiting sensitivity to cultural differences;

Clarity and Coherence 2.3 communicate in a clear, coherent manner, using a structure andstyle effective for the purpose.

Reading and Literature Studies (RL)

1. **Reading for Meaning:** read and demonstrate an understanding of a variety of literary, informational, and graphic texts, using a range of strategies to construct meaning;
2. **Understanding Form and Style:** recognize a variety of text forms, text features, and stylistic elements and demonstrate understanding of how they help communicate meaning;
3. **Reading With Fluency:** use knowledge of words and cueing systems to read fluently

Variety of Texts 1.1 read a variety of student- and teacher-selected texts from diverse cultures and historical periods, identifying specific purposes for reading;

Using Reading Comprehension Strategies 1.2 select and use, with increasing facility, the most appropriate reading comprehension strategies to understand texts, including complex and challenging texts;

Demonstrating Understanding of Content 1.3 identify the most important ideas and supporting details in texts, including complex and challenging texts;

Making Inferences 1.4 make and explain inferences of increasing subtlety and insight about texts, including complex and challenging texts, supporting their explanations with well-chosen stated and implied ideas from the texts;

Extending Understanding of Texts 1.5 extend understanding of texts, including complex and challenging texts, by making rich and increasingly insightful connections between the ideas in them and personal knowledge, experience, and insights; other texts; and the world around them;

Analysing Texts 1.6 analyse texts in terms of the information, ideas, issues, or themes they explore, examining how various aspects of the texts contribute to the presentation or development of these elements;

Evaluating Texts 1.7 evaluate the effectiveness of texts, including complex and challenging texts, using evidence from the text insightfully to support their opinions;

Critical Literacy 1.8 identify and analyse the perspectives and/or biases evident in texts, including complex and challenging texts, commenting with understanding and increasing insight on any questions they may raise about beliefs, values, identity, and power.

Text Forms 2.1 identify a variety of characteristics of literary, informational, and graphic text forms and demonstrate insight into the way they help communicate meaning;

Text Features 2.2 identify a variety of text features and demonstrate insight into the way they communicate meaning;

Elements of Style 2.3 identify a variety of elements of style in texts and explain how they help communicate meaning and enhance the effectiveness of the texts.

Reading Unfamiliar Words 3.2 use decoding strategies effectively to read and understand unfamiliar words, including words of increasing difficulty;

Developing Vocabulary 3.3 regularly use a variety of strategies to explore and expand vocabulary, discerning shades of meaning and assessing the precision with which words areused in the texts they are reading.

Writing (W)

1. Developing and Organizing Content: generate, gather, and organize ideas and information to write for an intended purpose and audience;
2. Using Knowledge of Form and Style: draft and revise their writing, using a variety of literary, informational, and graphic forms and stylistic elements appropriate for the purpose and audience;
3. Reflecting on Skills and Strategies: reflect on and identify their strengths as writers, areas for improvement, and the strategies they found most helpful at different stages in the writing process.

Identifying Topic, Purpose, and Audience 1.1 identify the topic, purpose, and audience fora variety of writing tasks;

Generating and Developing Ideas 1.2 generate, expand, explore, and focus ideas for potential writing tasks, using a variety of strategies and print, electronic, and other resources, as appropriate;

Research 1.3 locate and select information to fully and effectively support ideas for writing, using a variety of strategies and print, electronic, and other resources, as appropriate;

Organizing Ideas 1.4 identify, sort, and order main ideas and supporting details for writing tasks, using a variety of strategies and selecting the organizational pattern best suited to the content and the purpose for writing.

Form 2.1 write for different purposes and audiences using a variety of literary, informational, and graphic forms;

Voice 2.2 establish a distinctive and original voice in their writing, modifying language and tone skillfully and effectively to suit the form, audience, and purpose for writing;

Diction 2.3 use a wide range of descriptive and evocative words, phrases, and expressions precisely and imaginatively to make their writing clear, vivid, and compelling for their intended audience;

Critical Literacy 2.5 explain, with increasing insight, how their own beliefs, values, and experiences are revealed in their writing;

Producing Drafts 2.7 produce revised drafts of texts, including increasingly complex texts, written to meet criteria identified by the teacher, based on the curriculum expectations.

Interconnected Skills 4.2 identify a variety of skills they have in listening, speaking, reading, viewing, and representing, and explain how these skills help them write more effectively.

Media Studies (MS)

1. Understanding Media Texts: demonstrate an understanding of a variety of media texts;
2. Understanding Media Forms, Conventions, and Techniques: identify some media forms and explain how the conventions and techniques associated with them are used to create meaning;
3. Creating Media Texts: create a variety of media texts for different purposes and audiences, using appropriate forms, conventions, and techniques.

Purpose and Audience 1.1 explain how media texts, including complex and challenging texts, are created to suit particular purposes and audiences;

Interpreting Messages 1.2 interpret media texts, including complex or challenging texts, identifying and explaining with increasing insight the overt and implied messages they convey;

Critical Literacy 1.5 identify and analyse the perspectives and/or biases evident in texts, including complex and challenging texts, commenting with understanding and increasing insight on any questions they may raise about beliefs, values, identity, and power.

Form 2.1 identify general and specific characteristics of a variety of media forms and demonstrate insight into the way they shape content and create meaning;

Conventions and Techniques 2.2 identify conventions and/or techniques used in a variety of media forms and demonstrate insight into the way they convey meaning and influence their audience.

Purpose and Audience 3.1 describe the topic, purpose, and audience for media texts they

plan to create;

Conventions and Techniques 3.3 identify a variety of conventions and/or techniques appropriate to a media form they plan to use, and explain why these will help communicate aspecific aspect of their intended meaning most effectively;

Producing Media Texts 3.4 produce media texts, including complex texts, for a variety of purposes and audiences, using the most appropriate forms, conventions, and techniques.

Unit Overview (Part 1): Science Fiction Unit

Date	**Class**	**Lesson Title**	**Specific Expectations**	**Assessment**	**Lesson Outline**
Tues, April 9	1	What is SF?	RL 2.1, 2.2, 2.3	K/U; T/I	Silent reading [15 minutes] A mini lesson on SF will provide students with an overview of the genre. [15 minutes] Examples from a variety of mediums will be explored, and the assessment for this part of the unit (a 'SF Inventory') will be discussed. [10 minutes] Students will then work independently or in pairs to think about an example of a SF text they are already aware of from their own media engagement [15 minutes] The last 20 minutes of class will be dedicated to them discussing their choice, and why they think the example they chose classifies as SF. [15 minutes]
Fri, April 12	2	Novums: What is the new thing?	RL 1.1, 1.3, 2.1, 2.2, 2.3	K/U; T/I	Silent Reading [10 minutes] Mini lesson on novums and how they function in SF texts [15 minutes] Resource #1: Collaborative gameplay with *This War of Mine* [15 minutes] Resource #2: Reading "The People of Sand and Slag" [15 minutes] Discussion on how novums function in these texts: What are the novums? What purpose do they serve in these 'narratives'? [5 minutes] Work time to engage with SF resources for their inventory [10 minutes]
Mon, April 15	3	Cognitive Estrangement: How does SF work?	RL 1.1, 1.3, 2.1, 2.2, 2.3	K/U; T/I	Silent Reading [15 minutes] Mini lesson on cognitive estrangement as a genre convention [10 minutes] Resource #1: Collaborative gameplay with *This War of Mine* [15 minutes] Resource #2: Reading "The People of Sand and Slag" [15 minutes]

					Work time to engage with SF resourcesfor their inventory [15 minutes]
Tues, April 16	4	Extrapolation: Building off the present	RL 1.1, 1.3, 1.4, 1.5, 2.1, 2.2, 2.3	K/U; T/I	Silent Reading [10 minutes] Mini lesson on extrapolation[15 minutes] Resource #1: Collaborative gameplay with *This War of Mine* [15 minutes] Resource #2: Reading "The People ofSand and Slag" [15 minutes] Discussion: How might extrapolation explain the choices made in these texts?How could the narratives have been inspired by the author's present? [15 minutes]
Wed, April 17	5	Science Fictionality	RL 1.1, 1.3, 1.6, 1.7, 2.1, 2.2, 2.3	K/U; T/I	Silent Reading [15 minutes] Mini lesson on science fictionality - looking at contemporary phenomena that feel science fictional – (game) science fiction or reality? [15 minutes] Resource #1: Collaborative gameplay with *This War of Mine* [15 minutes] Resource #2: Reading "The People ofSand and Slag" [15 minutes] Writing: How do you make something *feel* like science fiction? [10 minutes]
Thurs, April 18	6	World Building: New Discoveries	RL 1.1, 1.2, 1.3, 1.6, 2.1, 2.2, 2.3 MS 1.2, 2.1	K/U; T/I; A	Silent Reading [10 minutes] What is world building? Dissecting an example together [Intro episode of *The100?]*. Note-taking task: Take notes based on what you have learned so far about SF. [45 minutes] Work time to engage with SF resourcesfor their inventory [15 minutes]

Wed, April 24	7	World Building: Settings	RL 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 2.1, 2.2, 2.3, 3.2, 3.3	K/U; T/I; A	Silent Reading [15 minutes] How do settings work in a world buildingproject? Place, time, space. An annotation exercise independently or inpairs, using excerpts from texts. What does a setting tell us about the world in which the story takes place? What might be implied? Introduce the absentparadigm here. [35 minutes] Sharing: What do you *think* this story is about/what is this world like, based on the details you pulled out? [20 minutes]

Thurs, April 25	8	World Building: Society	RL 1.4, 1.5, 1.6, 1.7, 1.8	K/U; T/I; A	Silent Reading [15 minutes] World building and society: What aspects of society do you have to think about? What elements contribute to our perception of a 'society'? A mini lesson on intersectionality and class, followed by a dissection of the societal structure in *Divergent*. [30 minutes] Comparing *Divergent* to contemporary society: What are the similarities? What are the differences? Think/pair/share [10 minutes] Work time for inventories [15 minutes]
Fri, April 26	9	World Building: Affect	RL 1.4, 2.2, 2.3, 3.2, 3.3	K/U; T/I; C	Silent Reading [10 minutes] How do SF authors/creators build a world that feels fundamentally *different* from the 'real world'? Sharing one of the inventory entries, and discussing elements of 'difference.' [30 minutes] Work time for inventories [30 minutes]

Mon, April 29	10	World Building: Exploring Issues	RL 1.1, 1.2, 1.3, 1.6, 1.8, 2.1, 2.2, 2.3 MS 1.2, 2.1	K/U; T/I; C; A Assessment *of*learning: SF Inventory duetoday (3 resources)	Silent Reading [10 minutes] World Building and Exploring Contemporary Issues: Dissecting *Black Mirror* "Nosedive" episode and social media. What issues does this explore? What do you think the author's perspective on major issues are here? How do they use SF world building and storytelling to discuss the issue in a different way versus, for example, an argumentative essay? [45 minutes] Finishing up inventories [15 minutes]
Tues, April 30	Interview #2 (whole period)				

Unit Overview (Part 2): The World Building Project

Date	**Class**	**Activity/ Lesson Title**	**Specific Expectations**	**Assessment**	**Lesson Outline**
Wed, May 1	11	Overview of World Building Project	RL 1.5, 1.6 W 1.2	T/I; A	Silent Reading [10 minutes] Share overview of world building project: what it will look like, what is expected of them/what will be marked, and looking at examples. [25 minutes] Work time for inventories for those who are not done [35 minutes]
Thurs, May 2	12	How to use a Wiki	MS 2.1, 2.2	K/U; A	Silent Reading [10 minutes] Lesson: How to use a wiki [15 minutes] Practicing using the wiki: getting signed up, creating a new page, embedding images and links. [30 minutes] Sharing what students did, addressing questions, and discussing how wikis will be used in the world building project [15 minutes]
Fri, May 3	13	Digital Mapping	MS 2.1, 2.2	K/U; T/I; A	Silent Reading [10 minutes] Lesson: How to use digital mapping tools, and this specific mapping tool [10 minutes] Practicing using geotools [20 minutes] Discussing how digital mapping will be used in this project, and answering questions [10 minutes] Work time: Thinking through preferred futures, imagined futures, anticipated futures - what they want to do in the world building project, and what they need to prepare for the first collab. meeting. [20 min.]

Wed, May 8	14	Collaboration Meeting #1: Discussing the Big Picture	OC 1.1, 1.2, 2.1, 2.2, 2.3 W 1.1, 1.2, 1.3, 1.4 MS 3.1, 3.3, 3.4	T/I; C; A Assessment *of* learning: Verbal Contributions to Discussion	Silent Reading [10 minutes] The class will meet as a group to decide on the key elements framing the world building project: How far in the future? What big events have taken place between 'now' and the year in which future Toronto is being envisioned? How will this shape individual narratives? What work needs to be done to 'fill in' the world? [45-60 minutes] Any left over time will be spent addressing collective questions and beginning work on the project.
Thurs, May 9	15	Work Period/ Exploring Resources	W 2.1, 2.2, 2.3, 2.7 MS 3.4	T/I; C; A	Silent Reading [15 minutes] Work period on world building project
Fri, May 10	16	Work Period	W 2.1, 2.2, 2.3, 2.7 MS 3.4	T/I; C; A	Silent Reading [15 minutes] Work period on world building project
Mon, May 13	17	Work Period	W 2.1, 2.2, 2.3, 2.7 MS 3.4	T/I; C; A	Silent Reading [15 minutes] Work period on world building project
Tues, May 14	18	Work Period	W 2.1, 2.2, 2.3, 2.7 MS 3.4	T/I; C; A	Silent Reading [15 minutes] Work period on world building project

Wed, May 15	19	Collaboration Meeting #2: Exploring Challenges	OC 1.1, 1.2, 2.1, 2.2, 2.3 W 1.1, 1.2, 1.3, 1.4, 2.7 MS 3.1, 3.3, 3.4	T/I; C; A Assessment *of* learning: Verbal Contributions to Discussion	Silent Reading [10 minutes] The class will meet as a group to explore emergent challenges the future Toronto they are building faces in the world building project: What challenges do they want to address? What do they think the biggest societal problems will be? How does this/will it impact their storytelling? How do their individual contributions reflect these challenges? What patterns arethey seeing emerge when looking at the entire world building project coming together? Additionally, what challenges are they facing engaging in the project? [45-60 minutes] Any left over time will be spent addressing collective questions and working on the project.
Thurs, May 16	20	Work Period	W 2.1, 2.2, 2.3, 2.7 MS 3.4	T/I; C; A	Silent Reading [15 minutes] Work period on world building project
Fri, May17	21	Work Period	W 2.1, 2.2, 2.3, 2.7 MS 3.4	T/I; C; A	Silent Reading [15 minutes] Work period on world building project
Tues, May 21	22	Work Period	W 2.1, 2.2, 2.3, 2.7 MS 3.4	C; A	Silent Reading [15 minutes] Work period on world building project
Wed, May 22	23	Collaboration Meeting #3: Exploring the Future (new date)	OC 1.1, 1.2, 2.1, 2.2, 2.3 W 1.1, 1.2, 1.3, 1.4, 2.7 MS 3.1, 3.3, 3.4	T/I; C; A Assessment *of* learning: Verbal Contributions to Discussion	Silent Reading [10 minutes] The class will meet as a group, and will be asked to present one ‘contribution’ they have made to the world building project, and discuss how they decided on various aspects of their example. Students will be asked to explore the details in the future Toronto they have created, and what

					still need to be 'filled in.' Questions posed will include how different contributions influence and impact one another, and what contradictions they have found between each others' work (and if/how they have resolved it). [45-60 minutes] Any left over time will be spent addressing collective questions and working on the project.
Thurs, May 23	24	Work Period	W 2.1, 2.2, 2.3, 2.7 MS 3.4	C; A	Silent Reading [15 minutes] Work period on world building project
Fri, May24	25	Work Period	W 2.1, 2.2, 2.3, 2.7 MS 3.4	C; A	Silent Reading [15 minutes] Work period on world building project
Mon, May 27	26	Collaboration #4: Thinking about Consequence	OC 1.1, 1.2, 2.1, 2.2, 2.3 W 1.4, 2.7 MS 3.1, 3.3, 3.4	T/I; C; A Assessment *of* learning: Verbal Contributions to Discussion	Silent Reading [10 minutes] The class will meet as a group to discuss/reflect on the way present issues have influenced their world building project. What can be explored/learned using this project? Do they think the project reflects consequences of present action in a meaningful way? What do they think is missing? How might they have changed the approach they took collectively to the world building project? [45-60 minutes] Any left over time will be spentaddressing collective questions and working on the project.
Tues, May 28	27	Final Touches	OC 1.6 W 2.1, 2.2, 2.3, 2.5, 2.7, 4.2 MS 3.4	Assessment *of* learning: Written contributions (3 entries)	Final touches on world building contributions, to be 'submitted' for assessment.

				Reflection on meeting contributions, and the world building process	
Thurs, May 30	Interview #3 (55 min) and Written Response (15 min)				

K/U = Knowledge/Understanding T/I: Thinking/Inquiry C = Communication A = Application

Resources included in this unit plan

General	Calendar for study/units
Lesson 1	Science fiction (SF) handout
	List of SF resources & SF inventory assessment*
Lesson 2	Novums handout
Lesson 3	Cognitive Estrangement Handout
Lesson 4	Extrapolation Handout
Lesson 5	Science Fictionality handout & Writing activity: 'How do you make something *feel* like science fiction?'
Lesson 6	What is world building? Handout
Lesson 7	World building settings handout
Lesson 8	World building and society handout (with intersectionality/class work, and the divergent exercise)
Lesson 10	World Building: Exploring issues handout & *Black Mirror* discussion prompts
Lesson 11	World Building assessment*
	Planning Goals for Collaboration Meetings
Lesson 12	'How to use a wiki' handout and exercise
Lesson 13	'Digital mapping tools' handout and exercise
General	Assessment descriptions*

Appendix E

Stage One Collaboration Meeting Questions (Text from Scaffolding Handout)

While the direction of the world building project and how it comes together is up to you, below are some rough goals to keep the project on track towards completion. For every meeting, you should come with your opinions on the following points and ideas on how potential issues might be addressed during the world building process.

Meeting 1: Discussing the Big Picture (Wed, May 8th)
This meeting will pin down the key elements framing the world building project:

How far in the future will the project take place? What big events have taken place between 'now' and the year in which future Toronto is being envisioned? (for example, a major disaster would change the kind of stories being told) How will this shape individual narratives? What work needs to be done to 'fill in' the world?

Meeting 2: Exploring Challenges (Wed, May 15th)
This meeting will serve two purposes: to collaboratively explore emergent challenges the future Toronto you are building might face, and to address challenges you are having in the world building process. Some questions to consider:

What challenges do you want to address in this future Toronto? What do you think the biggest societal problems will be? How does this/will it impact your storytelling? How do your individual contributions reflect these challenges? What patterns are you seeing emerge when looking at the entire world building project coming together? Additionally, what challenges are you facing engaging in the project? What will help address these challenges?

Meeting 3: Exploring the Future (Wed, May 22nd)
During this meeting you will be asked to discuss one 'contribution' you have made to the world building project and discuss how you made the decisions you made. Following this, the following things should be addressed:

Explore the details in the future Toronto you have created, and what still need to be 'filled in.' How do different contributions influence and impact one another, and what contradictions have you found between each others' work (and how have you resolved these contradictions or not)? What is there left to do to 'fill in' the world? Are there parts of future Toronto that need more attention?

Meeting 4: Thinking about Consequence (Mon, May 28th)
The focus of this meeting will largely be reflective, and will also serve as an opportunity to discuss final touches. The following questions have been designed to help guide this meeting:

What can be explored/learned using this project? Do you think the project reflects consequences of present action in a meaningful way? What do you think is missing? How might you have changed the approach you took collectively to the world building project?

Appendix F

Stage One World Building Project Assignment Handout

Lesson 11—World Building Assessment Info Sheet

The World Building Project: Future Toronto

The assessment for this unit will take the form of a world building project where, similar to the process science fiction creators work through, you will contribute to the collective creation of a fictional 'Future Toronto.' As a class, you will have to consider all of the elements of a fictional world we have explored, and use digital tools to 'build' a future Toronto where things happen, people live, and consequences of our present actions play out their logical possibilities.

Setting	Novums/New Discoveries & Events	Culture/ Community	STYLE/ Flavour
While the project is supposed to take place in Toronto, decisions still have to be made: How far outside Toronto does the project reach? How far into the future does this take place?	What big events/ new discoveries / significant changes have happened between the present and when the world building project takes place? Fill in the history!	How has culture and community changed in Future Toronto? What has contributed to these changes? A great place to start: How do you think your community will change?	What do you think Future Toronto in the year the World Building Project takes place will *feel* like for those who live there? Develop characters and explore through their voices.

Extrapolation: Inspired by the present

Draw from issues in the present that concern you to work through questions and problems you have with the way things are now. Think through anticipated futures *and* preferred futures: 'What happens if [x] doesn't change?,' but also, 'What if things that need to change do? What will the world be like?'

By the end of the unit, you will:

1. Write/create **three** wiki entries to the world building project, including supporting research and connections to other students' work through the running collaborative digital map;
2. Contribute to **three** planning sessions for the world building project, and **one** reflective session before final touches are added;
3. Write a **one page** reflection on the world building project, and fill out a **self-evaluation** of your contributions.

https://www.nationalgeographic.com/travel/destinations/north-america/canada/ontario/toronto/

Appendix G

Stage One Science Fiction Inventory Assignment

Lesson 1— SF Inventory & Unit Assessment

Science Fiction Inventory

For this unit, you will be asked to engage with 3 different science fiction (SF) texts, in 3 different mediums or categories.* Use this to check-off your progress. You will be given class time to engage with these resources.

If you bring a resource from home, get it approved by your teacher and write it in 'other.'

(1) SF Novels—Contemporary

- *The Drowned Cities* by Paolo Bacigalupi ☐
- *Ship Breaker* by Paolo Bacigalupi ☐
- *The Windup Girl* by Paolo Bacigalupi ☐
- *The Long Way to a Small Angry Planet* by Becky Chambers* ☐
- *Ready Play One: A Novel* by Ernest Cline ☐
- *The Martian: A Novel* by Andy Weir ☐
- *Archivist Wasp* by Nichole Kornher-Stace ☐
- *The City of Ember* by Jeanne DuPrau ☐
- *Brown Girl in the Ring* by Nalo Hopkinson ☐
- *The Isis Trilogy* by Monica Hughes ☐
- *Feed* by M.T. Anderson ☐
- *The Knife of Never Letting Go* by Patrick Ness ☐
- *Never Let Me Go* by Kazuo Ishiguro ☐
- *Leviathan* by Scott Westerfeld ☐
- *The Handmaid's Tale* by Margaret Atwood ☐
- *Oryx and Crake* by Margaret Atwood ☐
- *The Road* by Cormac McCarthy ☐
- *Parable of the Sower* by Octavia E. Butler ☐
- *The Hunger Games* by Suzanne Collins ☐
- *The Forgetting* by Sharon Cameron ☐
- *Uglies* by Scott Westerfeld ☐
- *Little Brother* and *Homeland* by Cory Doctorow ☐
- *Divergent* by Veronica Roth ☐
- Other: _____ ☐

(2) SF Novels—"Classics"

- *The Chrysalids* by John Wyndham ☐
- *Dune* by Frank Herbert ☐
- *The Left Hand of Darkness* by Ursula K. LeGuin ☐
- *Neuromancer* by William Gibson ☐
- *The Forever War* by Joe Haldeman ☐
- *Starship Troopers* by Robert A. Heinlein ☐
- *The Time Machine* by H.G. Wells ☐
- *Brave New World* by Aldous Huxley ☐
- *Cat's Cradle: A Novel* by Kurt Vonnegut ☐
- *Slaughterhouse Five* by Kurt Vonnegut ☐
- *Nineteen Eighty Four* by George Orwell ☐
- *Fahrenheit 451* by Ray Bradbury ☐
- *Do Androids Dream of Electric Sheep?* by Philip K. Dick ☐
- Other: _____ ☐

(3) Science fictional non-fiction

- *The Panem Companion: An Unofficial Guide to Suzanne Collins' Hunger Games…* by V. Arrow ☐
- *The Singularity is Near* by Ray Kurzweil ☐
- *The Future of Humanity: Terraforming Mars, Interstellar Travel, Immortality, and Our Destiny Beyond Earth* by Michio Kaku ☐
- *Robot Ghosts and Wired Dreams: Japanese Science Fiction from Origins to Anime* by Christopher Bolton & Istvan Csicsery-Ronay Jr. ☐
- Other: _____ ☐

(4) SF Graphic Novels

- *Global Frequency* by Warren Ellis ☐
- *Trish Trash: Rollergirl of Mars* by Jessica Abel ☐
- *Fahrenheit 451: The Authorized Adaptation* by Ray Bradbury & Tim Hamilton ☐
- *The Giver (Graphic Novel)* by Lois Lowry & P. Craig Russell ☐
- *Everyone's a Aliebn When Ur a Aliebn Too: A Book* by Jomny Sun ☐
- *Watchmen* by Alan Moore & Dave Gibbons ☐
- *V for Vendetta* by Alan Moore & David Lloyd ☐
- *A Wrinkle in Time: The Graphic Novel* by Madeleine L'Engle & Hope Larson ☐
- *The City of Ember: The Graphic Novel* by Jeanne DuPrau & Dallas Middaugh ☐

Suggest other texts if you have your own ideas/things you have wanted to read that fit the project!

Lesson 1— SF Inventory & Unit Assessment

(5) SF Short Fiction

Love Beyond Body, Space, and Time, edited by Hope Nicholson ☐
Walking the Clouds: An Anthology of Indigenous Science Fiction, edited by Grace L. Dillon ☐
So Long Been Dreaming: Postcolonial Science Fiction & Fantasy, edited by Nalo Hopkinson & Uppinder Mehan ☐
Twenty-First Century Science Fiction: An Anthology, edited by David G. Hartwell & Patrick Nielsen Hayden ☐
We Shall Be Monsters: Mary Shelley's Frankenstein 200 years on, edited by Derek Newman-Stille ☐
The Wesleyan Anthology of Science Fiction, edited by Arthur B. Evans et. al. ☐

In this category, pick one short story from the above anthologies. In your summary, say why you chose the story you did.

Extra Instructions

1. At least 1 of your inventory entries has to be from the first page of this inventory
2. For SF TV & Anime, you do not have to watch the entire series. 1-3 episodes (or however many you feel you need to complete your write-up) is enough.
3. For the Video Games category, you do not need to complete the game (with the exception of *This War of Mine*). You will need to decide based on the game how much you need to play to complete your write-up. You can also conduct additional research on the game to supplement your understanding of it.

For each inventory entry, you will submit:

1. A summary of each 'text,' in a format of your choosing: 1-page write-up, 3-minute video blog, infographic, poster, or another format of your choice.
2. 1-paragraph answer to the following question: Based on what you know now about SF, how does this text fit in with the genre as you understand it? Use concepts explored in class to support your answer.
3. 1-paragraph reflection, based on the following prompts:
   What might this imagined future say about the present issues the author was exploring at the time? How does this text help you think about your present as the reader/viewer/player? How does the format (video game, novel, etc.) shape your understanding of the text?

(6) SF Movies

Inception (2010) ☐
Limitless (2011) ☐
Arrival (2016) ☐
Minority Report (2002) ☐
The Martian (2015) ☐
Interstellar (2014) ☐
The Matrix (1999) ☐
Other: _____ ☐

(7) SF TV & Anime

Ghost in the Shell (1995) ☐
Akira (1988) ☐
Serial Experiments Lain (1998) ☐
Firefly (2002) ☐
The 100 (2014) ☐
beyond first episode
Black Mirror (2011) ☐
other than the 'Nosedive' episode
Travelers (2016) ☐
3% (2016) ☐
Dark Matter (2015) ☐
Altered Carbon (2018) ☐
Limitless (tv show) (2015) ☐

(8) Video Games

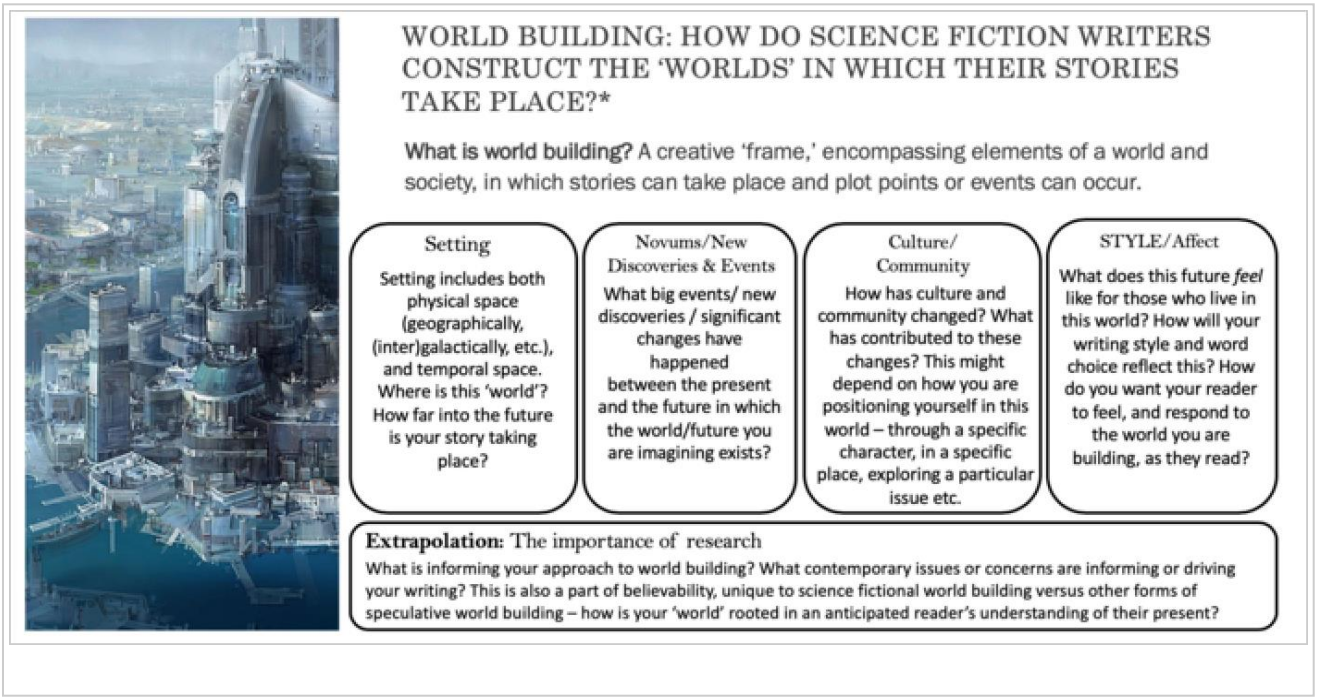
Fallout 4 (2015) ☐
This War of Mine (2014) ☐
Complete game beyond collaborative in-class use
Metro 2033 (2010) ☐
Rimworld (2013) ☐
Xcom 2 (2016) ☐
Elite Dangerous (2014) ☐
Eve Online ☐
(2003 – MMORPG ongoing)
The Division (2016) ☐

Appendix H

Stage Two World Building Assignment (from EduWiki platform)

Production 6 (Section A)

From EduWiki



This week we explored community-based media pedagogies and storytelling as both an act of expression and as an opportunity for listening as participation. Production 6 involves you telling your own story in/of education through Wikimedia and transmedia (the telling of a story across mediums) and engaging in listening to the stories of others. Our collective goal is to create a kind of storytelling ecology through interacting with potential 'futures' in education (inspired by major issues in the present) and building a repository of different stories and perspectives we can collectively learn with. These are the major questions at hand: As things are now, what might the future of education look like? How do our unique perspectives and positions impact the futures we imagine? Why is the work of looking forward and imagining possibility important for us, both in and beyond school contexts?

You will be imaging the future of education via science fictional storytelling through the lens of one major issue in education. For bonus marks, Integrate at least one other medium (using video, comiclife, tour builder, audio work, or a tool of your choice) into your wiki page in some way to tell your story. Think beyond the surface and create something meaningful/of interest to you. Engage in listening practices by exploring the work of others within the production (exact parameters of authentic listening negotiated in class) and stories/perspectives beyond our class.

Content (6 marks): Use science fictional world building techniques and processes of extrapolation (covered in class) **to imagine the future of education in the form of a wiki page.** To begin, you need to identify the larger, overarching problems facing education, schools, and youth today - andthen consider a future condition or "state of affairs" in relation to these challenges or current problems - be them social/cultural, ecological, institutional(schools), pedagogical, and or technological. **Consider the conditional term: "What if?"** And consider both dystopian and utopian modes of storytelling to make a critical point about schools today, through looking (speculating) towards the future.

Include a first- or third-person account of this 'future' (through the eyes of someone *living* in this imagined world) – What do you imagine it will feel like to learn in the future? How will it look (if current challenges and problems are not dealt with; if new "innovations" are invented or applied)? Forexample, will we learn alone, or in community? What will be the role of technology in learning, in relation to pedagogy? How will we learn? **Include any research you did to inform your perspective**, and be sure to give the general outline of the future you are imagining (Where is this imagined future taking place? When (how far into the future)? Whose learning are you focusing on?) (Ensure that this is a critical vision of the future that connects to current problems or opportunities today).

Reflection/Process (2 marks): How was this future of education inspired by your observations in the present? What process did you go through to construct your future narrative? What challenges did you face in imagining the 'future' of education? Why is this kind of storytelling important? **How does this connect to ideas we have been exploring in the course? Course ideas should be used to guide your thinking in some way.** What sources did you go to as research to inform your perspective/future story? (Be sure to include a section in your wiki where you discuss what research you did/what informed your imagined future in education). (2 marks)

Listening (2 marks): Who did you turn to/listen to in order to form your perspective on the 'future' of education? Did you revise your own work as aresult of that listening or become inspired in some way by the work of others? If your listening involved moving outside of our class community, whodid you listen to that informed your approach to this production? Consider how listening is discussed in our text for this week - how did you authentically engage with the stories and perspectives of others in order to inform your work in this production? (2 marks)

Transmedia: How did you use new media tools to work through your ideas, or represent the future of education you are imagining? Be creative in howyou integrate other tools to supplement your wiki/story. **(Bonus 2 marks)**