HOPE for the Science Education of Youth Involved with the Justice System

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Abstract

Equitable schooling requires that all students are able to participate, including those who are involved in the justice system. However, schools for youth who are in custody or in treatment are presented with challenges that may inhibit offering their student body science courses. This exclusion is a result of safety restrictions that coincide with what General Strain Theory (Agnew, 2006) refers to as having a strained population. Strained individuals experience significant life stressors that pressure them to anomie. Given the prevalent absence of strained individuals from science courses, it was a pleasant surprise to learn that the Healing Outdoor Program and Education (HOPE)–a remote treatment centre in a western province in Canada–had offered a for-credit high school science program during its operation from 2005 to 2020 that was a popular pick amongst students. In order to examine the science education experiences of youth who are involved in the justice system, this case study explores the types of strains that HOPE's students faced, how those strains affected their learning, and how the pedagogical strategies mitigated/exacerbated strains. Document analysis, interviews with teachers and staff, and a field observation revealed that a pedagogy built on relationship, place-based science education, and personalized education were integral to academic success. However, underpinning educational achievement was a distinctive holistic approach to students' wellness that addressed their physical, mental, emotional, spiritual, and social needs, through the use of Indigenous inspired practices, other forms of therapy, and the remote wilderness location. Furthermore, this case exemplified that it is not only feasible to offer science courses to strained individuals, but also possible to use science as a catalyst to reengage strained youth with schooling when teachers have the right conditions and supports. Therefore, this study presents pedagogical approaches that were successfully used with a marginalized group and provides recommendations for HOPE as they seek out funding partners to reinstate operations, so that they can continue providing youth with hope for a better future.

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Chapter 1: Introduction

Our current cultural moment in which discourses of equity are placed at the forefront calls for a re-evaluation of our educational practices (Ahmed, 2012; M. Apple, 2004; Henry et al., 2017; Young, 2020). When examining the educational outcomes of diverse groups, disparities are evident. Banks and Park (2010) state that "educational inequality is intractable, and the achievement gap is entrenched in many nations" (p. 386). In Canada, achievement differences that have persisted over time particularly in science subjects, include the underperformance of Indigenous students (see Yore et al., 2014) and those with low socioeconomic status (see Ma, 2001). As it is presented in formal education, science courses (physics, chemistry, and biology) have long been identified as subjects in which these groups are repeatedly deficient and viewed as disengaged (Aikenhead, 2001; Emdin, 2010a). Aikenhead and Elliott (2010) remark, "school science overtly and covertly marginalizes Indigenous students by its ideology of neo-colonialism—a process that systemically undermines the cultural values of a formerly colonized group... As a result, an alarming underrepresentation of Indigenous students in senior sciences persists" (p. 324). As a science educator, I personally witnessed factors that can lead to these disparities, such as boring pedagogical approaches that routinely require reading and answering questions from a textbook, culturally irrelevant and Eurocentric content, a lack of resources, and poor physical health (malnourished, fatigued, etc.). However, as one who has taught science to marginalized youth in a variety of settings—including remote northern First Nations communities and low socioeconomic urban areas—I have also experienced the capacity for *all* learners to participate and successfully complete science courses. These experiences have taken me on a journey in which I problematize science education, redefine a "quality science education," and unearth equitable practices for marginalized groups.

Teaching First Nations youth and adolescents racialized as Black led me to the justice system, where I encountered another disparity: the overrepresentation of Black and Indigenous youth in carceral settings. It is well documented in the US that this particular demographic has a higher than average frequency of arrests, trial waiting, and incarceration, which eventually leads to those involved in the justice system attaining a new second class citizen status as their criminal record ostracizes them from society (Alexander, 2010). Although in Canada data based on the racialization of those in the justice system are not collected, there are data on Indigenous

status that indicate an overrepresentation of those who identify as First Nations, Inuit, and Métis in these settings (Malakieh, 2020). Furthermore, in Canada, First Nations, Inuit, and Métis peoples are more likely to return to custody and to reoffend (Government of Canada, 2020b). Additionally, rates of recidivism are correlated with low academic performance (Katsiyannis et al., 2008). Indeed, the last time incarcerated adults across Canada were surveyed about their educational attainment it was found that close to half the population did not have a ninth grade education (Statistics Canada, 1999). I recognized that these group's underperformance in education and overrepresentation in the justice system is not a coincidence. Although the majority of those in custody had failed school—or perhaps schooling had failed them—it is believed that access to a quality education could help them to positively transition into society upon their release such that they desist in crime (Inderbitzin, 2009).

In Canada, the age that youth are required to attend school is determined by the province and ranges from 16 to 18, therefore, if they are incarcerated or in a post carceral treatment program, they may be legally obligated to go to school depending on their age (Government of Canada, 2017). Initially, I was only aware of the experiences of students in carceral schools, and post-justice system schools (e.g., treatment program schools) by word of mouth. While numerous studies on formal education in prison settings exist, they often focus on adults or on topics such as literacy (see Fisher, 2001; Fox, 1998; LeRoy, 2015; Linden, 2015; P. C. Little, 2014; Monster & Micucci, 2005; S. A. Robinson, 2018; Tighe et al., 2019). Based on the literature alone, it was not apparent if youth involved with the justice system—i.e., those who were in custody or recently released—were exposed to science education in a way that more fully supported their academic achievement.

My journey into the realm of schooling for those involved in the justice system led to many unknowns, therefore—in an attempt to gain an understanding of what was happening in these settings and to lay the groundwork for my research—I reached out to youth justice facilities in Eastern Canada to which I was in proximity (these institutions will remain unnamed for confidentiality). After sharing my research interests with teachers and staff who worked in said facilities, I was informed by educators that their schools preferred *not* to offer science due to safety restrictions. Mainly, students in secure care settings do not have permission to use sharp or dangerous objects that could be a hazard to themselves or others. These safety precautions prevent the presence of common science lab equipment, such as: scalpels for dissecting;

scoopulas for holding small granular objects; acids and bases, and even glassware for chemistry, as they can all be weaponized. Therefore, accommodations are required to offer high school science courses to these youth, and it is easier to bypass science for other courses such as language arts, math, and history, which do not require alterations. From a pragmatic perspective, I understood the difficulties that safety precautions presented for science education; the importance of students' welfare; and why these schools preferred not to offer science courses, thinking that upon release students would be able to attain these high school graduation credits at a traditional school.

Nevertheless, I learned that there was a secure care centre that offered locally developed science courses when students needed a science credit to graduate. The science course focussed on tending to animals and gardening. It was apparent that the teachers and staff believed that caring for plants and animals helped the youths' rehabilitation by increasing their empathy. The potential for science content to aid rehabilitation piqued my interest such that I immediately contacted the director about a prospective study on the locally developed science course. His enthusiastic verbal approval and written communications encouraged me to pursue this project. After receiving ethical clearances from the University of Ottawa, I reached out to the director via email to inform him that I was ready to embark on research, however, I received a reply that he had recently retired.

I relayed my research interests to the new director who requested that I get ethical clearance from the schoolboard. Given the schoolboard's research ethics committee only reviewed research applications at five set times per year and that it could take up to six weeks to receive a response from them, I worked diligently to complete the application in time for their next designated review period. Five weeks after submitting my application, the schoolboard provided me with a formal letter outlining that the the secure care school was not under their jurisdiction to grant approval/disapproval. I shared this information with the new director, and I spent weeks awaiting a reply. Although my research supervisor and I followed up with phone calls she did not return any of our calls. When the new director finally replied, she added a new requirement—that I attain research ethics approval from the Youth Justice Ministry. I contacted the ministry to inquire about the process for submitting an ethics application. They quickly responded, informing me that the specific secure care agency I wanted to research was "not directly operated by the Ministry" and "[I] would need to work with the respective agency

directly to seek the approval to conduct research." At this point, the time-consuming pursuit for unneeded ethical clearances—based on incorrect information from the new director—was concerning.

However, this process to have approval granted for my research may have uncovered another reason why literature on youth in secure care schools is lacking—there are many gatekeepers. A gatekeeper is someone who has the ability to grant a researcher access to a respondent or a community (D. Jensen, 2008; Keesling, 2008). Although I did not require approval from the schoolboard or Youth Justice Ministry (due to the specific facility where my research would have been conducted), other secure care schools could fall under the provision of the schoolboard/justice services. This means that there could be multiple gatekeepers between the investigator and potential respondents, which might deter researchers from conducting the study. In this case, the new director was a gatekeeper who my supervisor and I believed did not want to approve this study.

In light of the obstacles that gatekeepers presented, I was able to find another program that captivated my attention: The Healing Outdoor Program and Education or HOPE (a pseudonym for confidentiality), offered wilderness adventure therapy and schooling for high school credit to youth who had just completed their sentencing. As I gathered information to determine whether or not I should study HOPE, I learned through a brief discussion with an educator that science was a regular part of their programming. While other institutions could not offer science to youth who are involved in the justice system due to safety precautions, HOPE seemed to have a consistent program in place. I was determined to learn more about HOPE's approach to science education. Unfortunately, shortly after receiving ethical clearance to conduct the study, the Healing Outdoor Program and Education lost funding and ceased operations. As a result, I decided to reframe my study to learn from what *was* done at HOPE.

Overview of HOPE

HOPE was located in a remote wilderness region in a Western province of Canada. It offered youth who were involved in the justice system wilderness adventure therapy—that utilized Indigenous inspired approaches—and schooling for academic credit. The site was operational from 2005 until the program ended in 2020. HOPE was part of a not-for-profit umbrella organization that had a three-way partnership with the nearest school board and the

provincial health care system. The umbrella organization is currently looking for other partnerships and funders in order to make use of the site and to continue offering treatment and educational programming to marginalized youth.

There were usually three youth workers who monitored the youths and facilitated the therapy sessions, a supervisor, and at least one teacher at the site, along with a maximum of eight adolescents—boys and girls between the ages of 12-17. The teachers, youth workers, and supervisors all had a "four-on, four-off" continuous shift that required them to live at the site for four consecutive days, while they were working. Contrasted to traditional schools, everyone who was on-site ate meals together, shared chores (e.g., cleaning), and saw each other constantly (not just during working/school hours). Those who attended HOPE (referred to interchangeably as clients/students/youth/adolescents) were required to partake in the wilderness adventure therapy sessions and attend school.

The HOPE school was a one-room schoolhouse located on site and opened year-round. Since HOPE could only have a maximum of eight adolescents in treatment at a time, the school always had a low student-teacher ratio. The student demographic included boys and girls who, along with involvement in the justice system, struggled with addictions. The clients were admitted at any point in time, as long as there was a vacancy, and they would stay for a maximum of three months (the duration of the program). This meant that education did not occur during a regular school year, starting in fall and ending at the start of summer. Students had autonomy when it came to selecting the courses that they took. Depending on the student, they could leave HOPE having earned several credits (one student earned what was expected for a school year) or just a couple.

Research Questions

HOPE's students had a shared experience by having a criminal past, which may have affected their schooling. In addition, the type of science education they received may have been adapted due to safety constraints. Similarly, it is likely that these students experienced stressors and challenges which may have interfered with their schooling. In order to create a profile of HOPE's students and to understand how it influenced the type of education they received; the first research question delves into the potential strains/stressors that these students encountered. The second question builds off the first by seeking the particular challenges that strains posed to

their education at HOPE, and the third and fourth questions get into the pedagogical approaches that were used in science and their affects on strains. Science, being a subject in which this demographic underachieves and a required course for a high school diploma, is a subject of interest for research with youth involved in the justice system—a population whose schooling experiences in Canada are scarcely documented. Thus, to better understand approaches that support marginalized youth in science as well as barriers to their success, I posed the following research questions:

1) According to staff/educators and documents, what specific strains/stressors did students at HOPE face?
2) From the perspective of staff/educators, what challenges—if any—did these strains/stressors pose to the education they offered to young offenders?
3) As reported by staff/educators and documents, what pedagogical strategies were used to engage this student population in learning science? What was the rationale for these strategies?
4) According to staff/educators, did these strategies exacerbate or mitigate strains?

In order to analyze the dynamics between students' strains and the pedagogical approaches that were used at HOPE, I created a conceptual framework that connects the two via engagement. I used a qualitative case study methodology that had three phases. Each phase corresponded to one of the three data sources that were used. The first phase, document analysis, consisted of analysing a variety of textual documents, videos, and images to glean a contextual understanding of HOPE. This phase sparked additional questions that were posed in the second phase of the study—interviews. I conducted semi-structured interviews with former staff and teachers. This enabled the interviewees to discuss what was most pertinent to their experiences at HOPE. The rich descriptions from the interviews primed me for the final phase of the study, a field observation of the site. Since the closure happened shortly after the loss of funding—and coincided with restrictions on non-essential travel in Canada—I was unable to make classroom observations. Nonetheless, the various pieces of data, provided different vantage points on what HOPE was, the science pedagogy that was utilized, and how it operated in relation to students' strains.

Significance of the study

Although HOPE ceased operations in March 2020, I continued my exploratory case study on the science programming that *was* offered because insight on the schooling of this particular demographic is invaluable. This research contributes to the literature involving science education and the education of strained youth. More specifically, it presents the types of strains that students encountered at HOPE's school and the way those strains were handled. As a result, it can assist HOPE in planning how the site will be eventually used in the future, when it reopens. Reflecting on HOPE's unique combination of rehabilitation goals and pedagogical approach, this study sheds light on a number of strategies (as reported by participants) that can be successfully utilized to help marginalized students learn science in similar settings (e.g., treatment/therapy programs, secure care, etc.). In sum, this study provides insights on how to improve science pedagogy and curricula because research that examines the "success among the students who had been least successful [is] likely to reveal important pedagogical principles for achieving success for all students" (Ladson-Billings, 2014, p. 76).

Organization of the Dissertation

This dissertation describes an exploratory case study on the science programming at HOPE. In total it contains 7 chapters that contextualize the study and offer an in-depth analysis on the pedagogical challenges, successes and potentialities associated with HOPE's science courses. The following overview is intended to familiarize the reader with the organization of the dissertation and provide insight on the contents of each chapter.

In Chapter 2, I present a review of the literature and the conceptual framework of this study. In said chapter, I provide contextual information on science education in Canada prior to problematizing current practices and outlining approaches that have been successful with marginalized groups. Next, I focus on a particular marginalized demographic—youth who are involved with the justice system. Before I describe the type of science education that they are afforded, I preface their educational experiences with an overview of Canada's youth justice system and the need for this population to make academic strides, as it is not only beneficial for their rehabilitation, but also integral for reducing recidivism. Next, I discuss three pedagogical

approaches that have been successfully implemented with offenders. Lastly, I present the conceptual framework of this study.

In Chapter 3, I provide a detailed description of the methodology and methods that were used for this study. I begin with an overview of the case study methodology and the HOPE case. Next, I outline the ethical considerations that were made and the methods of triangulation. Following this I present the predominant methods of the study, which coincide with three phases: 1) document analysis, 2) interviews, and 3) field observations. I recount that the data collection and analysis for each phase occurred separately and in consecutive order, prior to comparing findings across all phases.

In Chapter 4, I present the results from each phase of the study separately. I begin with the documents that were analyzed, I describe them, and then I present the codes/themes that they contained. Next, I share data from the interview phase of the study, in which interviewees' results are discussed individually. After this, I describe my experiences during the field observation, which was the final phase of the study.

In Chapter 5 and Chapter 6, I discuss the findings of this study. In Chapter 5, I present sections on each research question, in which I compare data from all of the phases of this study, thereby triangulating findings from the document analysis, interviews, and field observation. In Chapter 6, I draw on the previous chapter and present the amalgamated major findings of the study regarding the strains that HOPE's students experienced, their affects on schooling at HOPE, the pedagogical approaches that were employed in science, and the findings on how those approaches exacerbated and/or mitigated strains.

Chapter 7 contains a discussion on the findings and the conclusion. I provide brief recommendations for HOPE as they determine how they will use the HOPE site in the near future. I outline the significance of this study and implications, prior to detailing the limitations and areas for future research. Finally, I reflect on the research journey.

Overall, each chapter builds on the one preceding it to provide a greater understanding of the context of HOPE, the study itself, and the research questions. The next chapter situates this study within relevant literature.

Chapter 2: Literature Review and Conceptual Framework

In this chapter I first present literature on education and criminology to contextualize the science education that youth in the justice system experience, prior to describing the conceptual framework. I begin by providing an overview of science education in Canada before raising concerns regarding the way that it alienates marginalized groups (e.g., Indigenous students). Next, I preface the schooling experiences of young offenders—amongst whom there is an overrepresentation of First Nations, Inuit, and Métis (FNIM) Peoples—with an outline of Canada's youth justice system and a discussion on different perspectives on why young people offend, thereby providing the reader with a better understanding of the strains that adolescent delinquents experience and the implications that those strains have on schooling. Then, I recount educational and rehabilitative programs that are offered to this demographic and three pedagogical approaches that are known to work. Lastly, I draw on the key elements of the literature in the conceptual framework.

Science Education

In Canada science education is considered integral for equipping the workforce with necessary skills for technological innovation (Government of Canada, 2020a). This emphasis on the workforce is best described as a utilitarian approach to education (see Maclure et al., 2011). It relegates science education to only being relevant for those who are entering/in a particular field, as opposed to being relevant for everyone. Yet, Murray's (2015) analysis of Canadian experts' (leading k-12 science educators, faculty of science professors, industry leaders, and those in science media) understandings of science education, found that those in the field held a broader view of the importance of a science education one that extended beyond equipping a workforce.

In fact, these experts held a decreased emphasis on science education for the workforce and an increased emphasis on science education for sustainability and human well-being, which apply to *all* Canadians (Murray, 2015). Similar discourses have been mentioned in Science, Technology, Engineering, and Mathematics (STEM) fields. A scoping review done on STEM initiatives in Canada states that a key component of the "STEM agenda should be to improve the proficiency of all students in STEM, irrespective of whether they choose to pursue STEM

careers or postsecondary studies" because a STEM education promotes "critical thinking, problem solving, creativity, collaboration, self-directed learning, and scientific, environmental, and technological literacy" (DeCoito, 2016, p. 115). In addition to the skillset that accompanies learning STEM, Martusewicz, Edmundson, and Lupinacci (2011) argue that those who are marginalized (e.g., those with low socioeconomic status and racialized as Indigenous or Black) should unquestionably have access to a science education that develops their scientific, environmental, and technological literacies, because historically said groups have been more likely to be exploited by malpractice in science fields. For instance, urban areas with low socioeconomic status are more likely to have a toxic waste plant built near to their community as opposed to wealthy suburban neighborhoods (Martusewicz et al., 2011). Similarly, said areas are more likely to be food deserts in which there is a lack of access to healthy and fresh food (Lupinacci, 2017). Although, providing nutritious food is an integral aspect of food security, Lupinacci (2017) argues, "a simultaneous, necessary task remains that education supports the development of healthy food conscious citizens who know and are free to make healthy choices in regards to food" (p. 105). Thus, science education is essential for everyone (including youth involved in the justice system), regardless of whether they pursue a science occupation or not because as Bellomo (2017) posits, "science education… is a civic right in a democratic society" (p. 134).

Yet, Tippett and Milford's (2019b) thematic analysis of science policies and pedagogical approaches across Canada, found science education to be of low priority. Their study examined curricula, policy documents, and pedagogical strategies used in each of Canada's provinces and territories. They highlighted key themes that were either consistent, in common, or different amongst all the regions. They found that throughout the country there were, "outdated science curriculum documents and national policy documents framework, limited funding and/or resources, limited Pro-D [professional development] opportunities, lack of assessment in comparison with… mathematics and literacy, and no mandated minimum instructional time" (Tippett & Milford, 2019a, p. 315), all denoting areas where science education must be improved.

Problematizing Science Education

Areas for improvement are especially concerning because science subjects are already known for being difficult to learn. Part of the reason is that science subjects require students to learn subject-specific terminology and to think in a new language, such as chemical formulas or plant taxonomy (King et al., 2017). Millar (1991) articulates:

> Science involves logical chains of argument, couched in abstract language. In other subjects, where language and ideas remain closer to the vernacular, learners can draw on lay understandings to make sense of the discourse of the subject. The greater 'distance' of science discourse from everyday discourse makes this much more difficult.

Therefore, content that one does not meaningfully encounter in daily life, such as electrons, extremely high velocities, and resonance systems add to the difficulty of the subject. In other words, science can be difficult for some because it requires them to think about what is happening on macro/microscopic levels and to communicate in a novel highly symbolic and/or representational manner (Goldring & Osborne, 1994). Therefore, science being distant from one's immediate (perceptible) reality, favours disengagement with it (King et al., 2017).

Furthermore, Chu and Fung's (2020) study on the relationship between the way Canadian 8th graders are assessed and their achievement levels in science suggests that the use of certain assessments might further students' disengagement. Their analysis of teachers' and students' responses to the Pan-Canadian Assessment Program questionnaire found that across all provinces, teacher-developed tests were the predominant method of assessment, with short answer questions being used most often. The prevalence of this form of assessment is problematic for a few reasons, which Chu and Fung (2020) contextualize in the following excerpt:

> [T]eachers have a tendency to use assessment types that they are familiar with; hence, they tend to focus on mastering the development and administration of a few types of assessments and repeatedly use those in their classrooms. This narrow scope of using only a few item formats of classroom assessments may skew achievement information by favoring those students who excel at completing the formats administered by their teachers (p. 794)

For instance, when students frequently have assessments that require reading comprehension and written responses (i.e., short-answer questions), students with weaker literacy skills are at a

disadvantage. Although there is a strong association between reading well and being scientifically literate (Yore et al., 2014), Chu and Fung (2020) found that students who reported doing experiments, explaining ideas to peers, and/or doing science investigations had higher achievement scores than students who did not report partaking in those types of assessments. Therefore, the consistent use of tests rather than using a variety of methods is a disservice to students.

Another problem in this subject area results from gendered disengagement, particularly by female students. This phenomenon has been referred to as a leaky pipeline in which females' initial interests in science diminishes as their schooling progresses (Sadler et al., 2012). However, even early on in their academic careers, girls have more negative attitudes and less confidence in science subjects when compared to boys (Chatman, 2008). One of the reasons behind this disparity lies in science capital, i.e., "science-related forms of social and cultural capital… [P]articular dimensions of science capital (science literacy, perceived transferability and utility of science, family influences) seem to be more closely related to anticipated future participation…in science" (DeWitt et al., 2016, p. 2431). In other words, boys may be more scientifically literate; they may have more science-related practices outside of school such as exposure to science media (shows, social media, video games, informal experiments); and they may receive more encouragement from peers, family, and teachers to continue taking science subjects (DeWitt et al., 2016). In addition, girls' constructions of femininity may not align with the masculine representations that are often associated with being a scientist, for instance, being a "nurturing teacher" may align with common conceptions of femininity as opposed to being an "Einstein" (Archer et al., 2013). Although progress has been made in reducing this gender gap "their [i.e., females] participation in postsecondary mathematics, physical sciences, and some engineering programs continues to lag behind that of males" (Yore et al., 2014, p. 5). This could be because females' interests in specific science courses tend more towards biology than to physics and technology (Baram-Tsabari & Yarden, 2008, 2011). Nonetheless, factors outside of the classroom related to access, support, and identity can deter one from learning science in school.

Aside from gendered disparities there are cultural mismatches and racisms within the science classroom. "Science has not been able to invoke immunity to racism. The fact that science is an inherently human activity means it is fraught with all the biases and tendencies

humans bring into it (Brown & Mutegi, 2010, p. 554). While Western and European contributions to science fields are important, an emphasis on Eurocentric content and accolades creates a monocultural experience in schools, which articulates inferiority of other groups and presents culturally irrelevant subject matter to students from those racialized groups (Nieto, 2010). This can make students feel alienated from what they are being taught (Emdin, 2010a). For First Nations, Inuit, and Métis students in particular, when "Indigenous ways of living in nature [are] not… welcomed in science classrooms…Indigenous students must suppress such knowledge to meet the conventional goal of thinking, behaving, and believing like a scientist" (Aikenhead & Elliott, 2010, p. 324). This results in "a consistent gap in achievement between Indigenous and non-Indigenous students… with non-Indigenous students outperforming Indigenous students on reading and science" (Yore et al., 2014, p. 5). For that reason, the science curriculum needs to be decolonized through a partnership with Indigenous communities, Elders, and Knowledge Keepers (Aikenhead & Elliott, 2010; Yore et al., 2014).

Without intervention a cycle emerges: culturally irrelevant content produces disengagement; disengagement leads to a lack of aspiration to science fields; and this lack of aspiration leads to underrepresentation in said fields (Emdin, 2010b). Categories of difference (such as underrepresentation of a given group in a certain field) become fixed as the perception that said group is simply incapable becomes widespread, and internalized by students in the underrepresented group who underperform, exemplifying stereotype threat (see Steele & Aronson, 1995). Emdin (2016) describes the cultural dissonance within schools and how it relates to criteria for success:

> Children are taught to be docile and complicit in their own miseducation and then celebrated for being everything but who they are, they learn quickly that they are to divorce themselves from their culture in order to be academically successfully. (p. 13)

Therefore, the teaching of science subjects in a manner that ostracizes the identities of learners inhibits their overall ability to learn.

As a result of the challenges related to culturally irrelevant teaching, gendered disengagement, issues of assessment, and difficult subject matter, students can experience frustration. Anxiety linked to learning science requires further assistance and support from teachers and peers to overcome (Kaptan & Timurlenk, 2012; Reis, Dionne, et al., 2015). Negative emotions towards the subject can lead to students lacking motivation and developing a

decreased sense of self-efficacy, preventing them from learning at the best of their ability and inhibiting chances of graduating (see González et al., 2017; King et al., 2017; Mallow & Greenburg, 1983). Considering that students across Canada are required to take science up to grade 10 in order to graduate (Tippett & Milford, 2019b), these unique challenges that science subjects present have been addressed in a variety of ways.

Success via Culturally Relevant Teaching and Indigenous Knowledge Integration

Envisioning oneself as a scientist is difficult for students who have never seen members of their group in science roles, which makes culturally relevant teaching a valuable tool for engaging all learners. Culturally relevant teaching is an approach that helps students to connect with what they are expected to learn, by utilizing the life experiences and cultures of students, to facilitate learning in a method that is applicable to their needs and context (Nieto, 2010; Wallace & Brand, 2012). Culturally relevant pedagogy "not only addresses student achievement but also helps students to accept and affirm their cultural identity while developing critical perspectives" (Ladson-Billings, 1995, p. 469). Thus, culturally relevant science pedagogy can be an effective approach to engage students who would otherwise feel disconnected.

One culturally relevant strategy is to enhance science courses with Indigenous knowledge (Aikenhead, 2014). In Canada, there has been a recent shift to include Indigenous perspectives and approaches within science subjects. In their analysis of science education across the nation, Tippett and Milford (2019a) noted that "a common theme running across most jurisdictions with regional variations emerging was attention to Indigenous perspectives, particularly Indigenous knowledge about nature and naturally occurring events" (p. 317). This focus on integration is linked to a national emphasis on decolonizing practices: Integrating Indigenous knowledge contends against neo-colonialism, which is "characterized by systemic discrimination, such as excluding IK [Indigenous knowledge] from a school science curriculum" (Aikenhead, 2014, p. 5). Narrow views on science, including the myth that there is only one scientific method (see Woodcock, 2014) and in turn only one valid way of investigating nature, must be unlearned to enable a rich diversity of scientific approaches to be included (Aikenhead, 2014). Furthermore, Indigenous science and western science explain nature in complimentary manners. Indigenous worldviews are holistic and focus on interconnected relationships, whereas physical sciences are reductionist in that they tend to, "break apart a phenomenon into smaller or simpler parts"

(Aikenhead, 2014, p. 25). Thus, an infusion of Indigenous knowledge provides the learner with a bigger picture.

Aikenhead's (2014) handbook on *Enhancing School Science with Indigenous Knowledge: What we Know from Teachers and Research* outlines key protocols that must be followed to include Indigenous science in school settings; describes how Indigenous knowledge has been infused in schools; and recounts empirical evidence for the efficacy of this inclusion. He highlights that relationships are central to Indigenous pedagogy and they extend beyond anthropocentric relations, to our connections with other biotic beings and the abiotic world. Therefore, in order to share Indigenous Knowledge meaningfully and respectfully, Aikenhead (2014) lists protocols that must be adhered—such as, asking permission to share a teaching, mentioning the permission that was granted to share said teaching, and using tobacco to express gratitude.

When these practices are followed, teachers recounted several benefits to students' learning. They found that: students were more engaged; being on the land had a calming effect; their retention of the material improved; learners had increased self-esteem; they were able to critically analyze their own views and biases; and students who had never self-identified as Indigenous felt safe to do so (Aikenhead, 2014). A grade eight teacher, Cyndi, implemented the Circle of Courage model[1]—a pedagogical strategy inspired by Indigenous education that focusses on belonging, independence, mastery, and generosity—to accompany the Indigenous science that she was integrating in her teaching. She remarked:

> *We remind ourselves from time to time of certain behaviours, for example, Is that behaviour helping your neighbour's independence? Or is that behaviour encouraging mastery? There is always awareness in the classroom now. It makes students think, "This is a need we have as humans"* (italics in original). (Aikenhead, 2014, p. 65)

Cyndi's use of the Circle of Courage compliments what they learn in ecology and environmental science because they view the world around them as part of their circle. Thus, reciprocity and respect for all things is not only taught, but also exemplified in their lessons.

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[1] The Circle of Courage Model is also used with youth who are involved in the justice system. This model is further discussed later in this chapter in the section on education and rehabilitation.

Success via Citizen Science and Place-Based Education

Another culturally relevant strategy that has been used in science education and particularly in environmental education, is citizen science. This approach can take the form of: community members making observations and collecting data that will be used by scientists; and/or conducting research to address their own needs (Kullenberg & Kasperowski, 2016). An example of a citizen science initiative is the collaboration between the "Heiltsuk First Nation… and Pacific Wild, an NGO, to provide an 8-week place-based learning experience for student interns focused on ecology and natural resource management" (Yore et al., 2014, p. 99). Through this project Indigenous interns perform juvenile salmonid and stream assessments, research crabs, and conduct other studies in the region of the Koeye watershed (Yore et al., 2014). Tools for supporting these efforts include cameras, hydrophones, and Smart technologies, which are all supplied to the interns (Yore et al., 2014). In this way, students can do their part to engage in science practices that are more relevant to their contexts.

Linking science to where we live is not only integral for citizen science, but it is foundational to place-based education. This approach involves learning as problem-solving in local areas outside of the classroom (Greg & Claire, 2011). It provides students with the opportunity to make positive changes in their community by conducting research and taking action to meet a need, all while using their ways of knowing (Barton & Tan, 2010). These changes can relate to the physical space (such as protecting natural habitats, creating more green spaces; getting a traffic light installed) or to social circumstances (such as creating a breakfast program at school, addressing bullying). Therefore, place-based youth activism through schools produces "citizen scientists in our communities who are committed to… denounce the unscientific basis of prejudice and discrimination" (Reis, Ng-A-Fook, et al., 2015, p. 52). Consequently, local environments enable students to engage in meaningful fieldwork and research, which not only benefits the community but also enhances learning. In "Teaching Science Outside the Classroom," Dillion (2011) argues for the use of fieldwork:

> Fieldwork works. It improves knowledge; it improves skills; it improves motivation. Denying students fieldwork is like denying them books, or pens, or computers. Denying some students fieldwork while allowing others to benefit from it is intellectually bankrupt and morally indefensible. (p.144)

Thus, the benefits of place-based education include connecting with the community, addressing their needs, and improving learning.

Success via Hands-on Science and Inquiry-Based Science

Culturally relevant teaching, citizen science, and place-based education reap additional benefits when accompanied by a hands-on approach to science instruction—a method that proponents Haury and Rillero describe in *Perspectives on Hands-on Science Teaching* (1994). As the name implies, hands-on involves providing students with the opportunity to work with their hands to design, construct, and test theories/experiment. In fact, hands-on methods have also been shown to help teachers to understand curricular content (Maz-Machado et al., 2019). Some of the benefits of hands-on science are an increase in learning; a rise in students' motivation to learn; decreased anxiety amongst students; greater enjoyment of learning; enhanced skill proficiency, which includes communication skills; independent thinking and an improved ability to make decisions based on experimental evidence; and an increase in students' perception and creativity (Haury & Rillero, 1994).

In spite of these benefits, science educators have critiqued hands-on experiences, particularly recipe laboratory designs. These tasks give students a pre-created procedure to follow that fails to elicit scientific inquiry (Chu & Fung, 2020). Chu and Fung (2020) argue that forms of scientific inquiry:

> require engaging students with opportunities to learn the processes and dynamic relationships between empirical research and scientific discoveries… [and] a shift towards mind[s]-on laboratory tasks, which by contrast also include components that engage students in a dialog involving the processes of scientific inquiry and the knowledge derived through these methods. (p. 795)

Therefore, hands-on activities that follow a step-by-step process not only prevent this level of engagement but also foster an erroneous concept about the nature of science in students' minds in which there is one single mode of operation as outlined by the scientific method (Woodcock, 2014). Thus, hands-on learning does not always equate to minds-on learning.

The coupling of hands-on science with inquiry-based approaches ensures hands-on and minds-on engagement (Huber & Moore, 2001). Inquiry-based activities enable students to design and apply their own investigations (Gillies, 2020b), in which their creativity is not restricted by a

one-size-fits-all approach. Fang, Lamme, Pringle, and Abell (2010) succinctly state, “inquiry-based science recognizes science as a process of discovery and invention that involves engagement, exploration, explanation, application, and evaluation” (p. 3). Numerous studies have shown that an inquiry-based approach to science education is superior to traditional approaches in that students engage in science more, their content knowledge is increased, and inquiry skills are honed (Chen et al., 2014; Dalton et al., 1997; Walker et al., 2017; C. D. Wilson et al., 2010).

Inquiry-based activities require students to pose a question; plan an investigation that will address that question; carry-out their investigation by collecting and interpreting data; and document and share their findings (Constantinou et al., 2018). Huber and Moore (2010) suggest a model to help educators make the transition from hands-on science to hands-on inquiry-based science: Their model involves, engaging students and directing inquiry through discrepant events (e.g., placing a raisin in a carbonated drink where it will begin a cycle of floating then sinking); brainstorming potential investigations as a class (e.g., does the size of the raisin determine how quickly the floating/sinking cycle will occur); using suitable performance aids to give students structure (e.g., worksheets); and sharing findings with their peers upon concluding research. In sum, the inquiry-based approach makes students go beyond following in the footsteps of scientists to being scientists who carry-out authentic experiments (Gillies, 2020a).

The success of inquiry-based learning, hands-on approaches, place-based education, citizen science, Indigenous knowledge integration and culturally relevant teaching is evident in conventional for-credit science praxis. Although, these approaches have found similar achievements with those who are involved in the justice system, albeit in informal contexts and rehabilitative educational spheres such as wilderness adventure therapy, horticultural groups, and agricultural programs, the education of said population presents additional challenges. In order, to better understand the teaching and learning contexts for youth who are involved with the justice system, I first present an overview of Canada’s youth justice system, differing perspectives on the genesis of youth crime, the links between education and rehabilitation; before describing science education for those in the justice system.

Canada's Youth Justice System

In Canada the Youth Criminal Justice Act (YCJA)—which was active since 2003—applies to youth who are aged 12-17 (Department of Justice Canada, 2021). The enforcement of the YCJA, via correctional services, is under the jurisdiction of provinces and territories (Malakieh, 2020). The main principles of the YCJA are: to provide accountability to youth who have broken the law; and to promote their rehabilitation and their reintegration into society, while protecting the public (Department of Justice Canada, 2021). The level of accountability for those who are found guilty takes into consideration the fact that due to their age, they have a reduced level of maturity. Therefore, meaningful consequences are given that will promote their rehabilitation and support their reintegration. In addition, youth workers are assigned to supervise and support them in this process. Thus, consequences may include participating in treatment, community service, custody, or a combination of the aforementioned (Department of Justice Canada, 2021).

Adorjan and Ricciardelly (2018) explored the experiences of 62 youth correctional officers since the inception of the YCJA. After analysing each interview, they found that although youth prisons are pitched as rehabilitative or treatment centers, "at minimum, COs [corrections officers] increasingly see their role as oriented to incapacitation, if not punishment, and not to rehabilitation" (Adorjan & Ricciardelli, 2018, p. 668). The authors argued that the COs retained agency in determining which youth would profit from their rehabilitative efforts, as opposed to, when it was sufficient to provide a minimal effort to meet their occupational commitments for the ones that they deemed incorrigible. In a pragmatic approach the COs sought to "save those who want to be saved [and] [f]or those who transgress even in minor ways, especially in ways that disrespect officers, the punitive "lock down" responses engendered are ironically more intensive than the adult system" (Adorjan & Ricciardelli, 2018).

Although Adorjan and Ricciardelly's findings suggest that the principles of the YCJA are not being embodied in custodial settings, the report on *Adult and Youth Correctional Statistics in Canada* (Malakieh, 2020) provides further insight on youth justice and demonstrates ways that the YCJA principles have transformed the system. In 2018/2019, on average there were 716 youth in custody per day (i.e., detained) and 5,713 youth under community supervision per day (Malakieh, 2020). Adorjan and Ricciardelly (2018) acknowledge that "since the implementation of the YCJA… youth incarceration rates decreased tremendously" (p. 664). This decrease in

incarceration rates is attributed to the fact that the YCJA supports referring youth to community programs (Malakieh, 2020). This coincides with the finding that the majority of youth (72%) are also *entering* correctional services through community supervision, "which includes bail (supervised in Saskatchewan and British Columbia), non-residential programs, fine options, orders for restitution, compensation or other community or personal services, and other sentences deemed appropriate by the youth justice court" (Malakieh, 2020, p. 13). Thus, Canada's youth justice system is diverting those who were found guilty from incarceration and into other programs such as treatment.

Overrepresentation of Indigenous Peoples and Interventions?

The report on *Adult and Youth Correctional Statistics in Canada* (Malakieh, 2020) provided integral demographic information on those who are involved in the youth justice system. In 2018/2019 the majority of youth who were admitted to correctional services were male (77%) and the majority age at the time of admission for everyone who entered correctional services was 16-17 (53%) (Malakieh, 2020). Although, "[i]n 2018, Indigenous youth represented 8.8% of the youth population in Canada… Indigenous youth represented 43% of youth admissions to correctional services in 2018/2019" (Malakieh, 2020, p. 15). This overrepresentation of Indigenous youth is congruent to the overrepresentation of Indigenous adults in the justice system and points to a blatant disparity within Canada's justice system.

The provincial break down of overrepresentation indicates that the provinces with the greatest amount of overrepresentation—the western provinces—are also the provinces with the most Indigenous youth (Wiley et al., 2020). In these areas, overrepresentation is due to an increase in admission into the justice system, as opposed to recidivism. The incarceration of Indigenous adults in two of these provinces is staggering because they comprise "three-quarters of admissions to custody in Manitoba (75%) and Saskatchewan (75%) [and] [a]ccording to Census projections… Indigenous adults… [represent] 16% of the population in Manitoba and 14% of the population in Saskatchewan" (Malakieh, 2020, p. 9). Although Statistics Canada makes these data publicly available, a discussion of these findings is left to be desired.

Wiley, Love, and Emmet (2020) explain the provincial variability in overrepresentation that they found in their analysis of Canada's youth justice system with the correlation between population and systematic racism. They state, "the majority group perceives the minority group

as increasingly threatening… More systematic racism could play out in various discretionary forms at the early stages of initial police contact particularly if law enforcement officials use risk factors" (Wiley et al., 2020, p. 38). Although Indigenous youth have multiple risk factors, they need to be contextualized within understandings of colonialism, racism, and the legacy of residential schools (Wiley et al., 2020). Further complicating this matter is that correctional resources are predominantly located in urban areas, which necessitates that youth residing on reservations or in rural regions leave their communities to attend rehabilitation/treatment programs (Wiley et al., 2020). Historically in Canada, the removal of Indigenous youth from their communities has been detrimental (see Truth and Reconciliation Commission of Canada, 2016), which makes these interventions questionable.

In an attempt to address the needs of First Nations, Inuit, and Métis Peoples within the justice system, the Indigenous Justice Program (Department of Justice Canada, 2020) supports alternatives to the mainstream system, in which Indigenous community-based programs are used. The rationale for this is to enable Indigenous Peoples to administer justice within their communities; to include Indigenous beliefs; and to promote a decrease in crime within these communities (Department of Justice Canada, 2020). However, programs of this nature have been critiqued for not considering the strains that Indigenous women/girls encounter. This demographic has a twofold motivation to commit crimes, which includes personal security and not having their basic needs met: For that reason, the predominant pathways through which Indigenous women/girls enter the criminal justice system are poverty, sex trade, violence, addiction and mental illness (Reitmanova & Henderson, 2019). Therefore, if these contextual circumstances are not addressed, those who complete these interventions will, "typically encounter the very same societal and individual obstacles, such as poverty, unemployment, addictions, or violence, which influence their decision to commit a crime whether as a means for economic survival or as an act of self-defence" (Reitmanova & Henderson, 2019, p. 13).

Different Perspectives on the Genesis of Youth Crime and their Implications for Schooling

Understanding the motivation behind why one commits a crime is not only an integral part of criminology that is used to mitigate offending but also a necessary prerequisite for designing and understanding rehabilitation programs, including educational programs. Although it is beyond the scope of this literature review to recount every criminological theory's

explanation for why youth engage in crime, I outline four of the theories that McLaughlin and Newborn (2010) include in their overview of contemporary criminological theory; and I describe their implications for the schooling offered to youth involved in the justices system. Thus, I discuss biopsychological theories, social control theories, social learning theories, General Strain Theory (GST), and discourses pertaining to the school-to-prison pipeline.

Biopsychological Criminological Theories

Genetic theories focus on an individual's biological traits and links these traits to criminal activity (Baker et al., 2010). In particular, genetic research pertaining to criminal offending, "aims to specify the nature of both genetic and environmental influences, and how they may interact with one another to lead to criminal outcomes" (Baker et al., 2010, p. 22). For instance, brain dysfunction related to verbal and executive functioning (frontal lobe) has been connected to delinquency (Moffitt, 1990). However, there is no explicit gene that is linked to crime and there is no specific detrimental environment that can lead to deviant behaviour (Barnes et al., 2020).

Fetal Alcohol Spectral Disorder (FASD) is the most prevalent noninheritable source of cognitive disability (Denny et al., 2017). It results from prenatal alcohol exposure and can have a range of effects including: "prenatal and/or postnatal growth retardation, facial dysmorphology, central nervous system dysfunction, and neurobehavioral disabilities" (Denny et al., 2017, p. 515). Along with these effects, "secondary characteristics of FASD… include[e] involvement in the mainstream criminal justice system" (Public Safety Canada & Aboriginal Corrections Policy Unit, 2010, p. 2). Furthermore, in Canada Indigenous Peoples are at a higher risk of having FASD (Public Safety Canada & Aboriginal Corrections Policy Unit, 2010), which presents another variable complicit in their overrepresentation in the justice system. Therefore, receiving early intervention is integral for reducing the chances that one with FASD has of ending up in the justice system and/or abusing substances (Denny et al., 2017).

However, FASD also presents challenges to educational/rehabilitative efforts through one's hyperactive behaviour, inability to maintain attention, learning disabilities, and lack of impulse control (Public Safety Canada & Aboriginal Corrections Policy Unit, 2010). These barriers emphasize that rehabilitative initiatives must cater to the specific needs/abilities of those involved. A recent study done on the ability of Canadian federal carceral programs to

significantly improve offenders' odds of staying in the community without a post-release offence, found that the "most promising programs are: 1) education programs, especially those that help offenders achieve close to a high school equivalent" (Wilton et al., 2016). Therefore, multi-method interventions are posited within biopsychological criminology rather than solely depending on medication (see T. E. Robinson & Berridge, 2000; Vaske, 2017), because it is understood that "the brain is also malleable and is affected by education and daily experiences" (Bueno, 2019).

Social Control Theory

Social Control Theory focusses on the role of societal attachments in crime, as opposed to genetics. Based on Social Control Theory, there is a higher probability that crime will occur when one's bonds to society are weak (Laub et al., 2020). Bonds to positive aspects of society can be categorized by four phases: the first is attachment, which describes the strengths of ties to parents, peers, and others; the next is commitment, which pertains to the interest one has in conforming to social norms and the degree to which criminal activity would hinder conforming; this is followed by involvement; which refers to engagement in society that restricts one's ability to get involved in crime due to time constraints or incompatibility; and the last is belief, which is the extent to which one endorses societies' morals (Akers & Lee, 1999). According to control theories, differential involvement in criminal activity occurs due to "differences in restraints or controls" (Paternoster & Bachman, 2010, p. 114). Simply put, being positively connected to society sanctions deviance (Hirschi & Gottfredson, 2020). Therefore, it is integral for adolescents who have had criminal involvement to accomplish some milestones in life (such as getting a job), which will positively connect them to society and prevent recidivism (Laub et al., 2020). This commitment to constructively conform in society "is formed primarily through socialization by the family, school and other social institutions" (Paternoster & Bachman, 2010, p. 122). Consequently, because youth who are involved in the justice system have required attendance, which is enforced, schooling provides them with a positive socializing environment, while enabling them to accomplish a milestone (e.g., pass, move on to another grade level, graduate), which combined has the potential to strengthen their bonds to society and limit reoffending.

Social Learning Theory

Social Learning Theory—similar to Social Control Theory—does not consider genetic traits. Instead, Social Learning Theory focusses on positive interactions with those with deviant behaviour, who educate others to follow their criminal example (Akers & Jensen, 2010). This educational experience requires four key prerequisites: differential association, which is a variance in the exposure different people have to positive and negative behavioural patterns; definitions, which is one's attitude towards positive and negative behaviours; imitations, which is witnessing someone committing an illegal/deviant act; and differential reinforcement, which is the balance between punishments and rewards from the act (Akers, 2017; Pratt et al., 2010). Based on these four components, a crime occurs when one: first, associates more often with those who support, model, and commit criminal acts; second, follows suit and receives rewards for deviant behaviour; and third, values illegal activity over conforming to legal societal norms (Akers, 2017). Therefore, schooling inhibits the chances of imitation, in that while students are present in school they are (or should be) sheltered from viewing, learning, and executing criminal activity. Thus, relationships with those who are already involved in crime facilitate an educational experience where crime is modelled and then imitated; and schools present a physical space that displaces one from being able to build those relationships.

General Strain Theory

Agnew's General Strain Theory (GST) takes a holistic approach to crime and considers factors "including level of social control and association with delinquent others… as well as several other literatures" (Agnew & Brezina, 2010, p. 99). He posits that a number of stressors or strains increase one's likelihood to take part in criminal activity. Strains can take a variety of forms, including: not being able to attain positively valued goals (e.g., money); losing positively valued stimuli (e.g., breaking up with a partner); and being surrounded by negatively valued stimuli (e.g., physical abuse) (Agnew, 2006). Crime offers a way to reduce the strain (e.g., steal money) or escape from it (e.g., use illegal drugs as a coping mechanism) (Agnew, 2001). Thus, GST—not excusing criminal activity—presents one as being pressured into crime due to a range of strenuous circumstances (Agnew, 2006).

Agnew (2006) argues that GST can further contextualize genetic criminological theories, Social Control Theory, and Social Learning Theory. Thinking about crime in terms of strains can

support genetic criminological theories because strains that are experienced early on in one's life, such as parental rejection and harsh discipline, contribute to biopsychological traits that are conducive to crime (Agnew, 2006). Similarly, he goes on to show connections between GST and Social Control Theory, by stating that "strains may reduce one's level of social control," and by providing the following example: "[P]arental abuse may reduce one's emotional bond to parents" (Agnew, 2006, p. 23), which would weaken the attachment phase. He also draws connections between GST and Social Learning Theory by arguing that "strains may foster the social learning of crime" (Agnew, 2006, p. 43) because they increase the appeal of joining a criminal group for status or for protection. Furthermore, by drawing "on broader criminology literatures [GST] more fully describe[s] the factors that condition the effects of strains on crime" (Agnew & Brezina, 2010, p. 99). A side-by-side comparison of GST and Social Control Theory, Social Learning Theory, and biopsychological theories can be found in Figure 1.

Figure 1

Comparison of the way Crime is Viewed in Core Criminological Theories

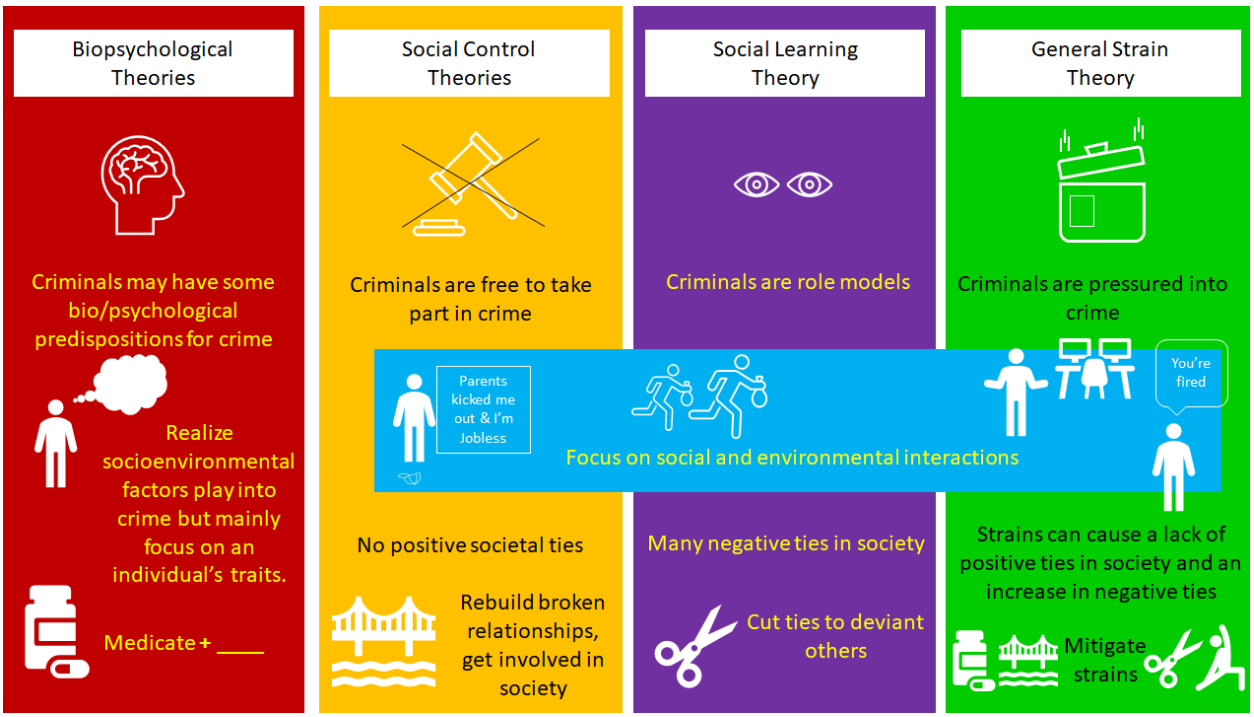


Figure 1 summarizes each of the criminological theories that have been discussed and their explanations for why youth engage in crime, by: outlining the way that criminals are

perceived (e.g., do they have a predisposition for crime, are they pressured); briefly noting the way their circumstances are viewed (e.g., not having positive connections to society); and describing the interventions that are used (e.g., medicating, building positive connections to society, etc.). The interventions that are described within GST are specific to the type of strains that one endures. Due to the various strains that exist, the interventions within GST vary. However, the wide range of strains has led to a critique of General Strain Theory: Having many strains prevents GST from being falsified as new measures could emerge to salvage it (G. F. Jensen, 2019). In other words, if a supposed strain turns out to not have any correlation to crime, it would be expected to invalidate the theory; however, a correlation between another strain and crime might be found, which would then garner support for General Strain Theory.

Although GST is all-encompassing, there have been key strains that are correlated with crime and certain characteristics of strains that are are more likely to lead to crime, such as: strains with a high magnitude, or the severity of the strain on the person is very high (e.g., losing all of one's money); strains that seem unjust (e.g., being a victim of a crime); strains that reduce the cost of crime (e.g., nothing to lose mentality because of the loss of loved ones); and strains that promote/make crime seem positive (e.g., living in a rough neighbourhood where a gang runs the streets) (Agnew, 2009). Here, it is important to acknowledge that not everyone who is exposed to strains will resort to criminal activity: Other factors including one's disposition for crime, the ability to engage in coping methods that are legal, and the considered societal costs of criminal activity also play a part in determining whether one will turn to crime (Agnew, 2006).

Strains Connected to Schooling

When GST was first posited school failure was not considered as having a strong correlation with criminal activity (Agnew, 2001). In turn, any correlation between strains in school and crime was rather explained through the link between education and employment, such that a lack of academic achievement meant that one would not be able to attain employment and in turn unemployment was assumed to be a precursor to crime. However, further research in GST has shown that a "negative secondary school experience such as low grades and negative relations with teachers" (Agnew, 2009, p. 102) is a significant predictor of criminal activity. Hence, being a high school dropout is correlated with criminal activity (Ngo et al., 2011).

However, GST recognizes that schools themselves can be a source of strains. An entire school may be considered strained because it has a disproportionately high number of strained individuals and strains within them (e.g., pronounced issues with bullying). These types of schools may be located in low socioeconomic regions where strains are high, or they may cater to students who experience more strains (de Beeck et al., 2012). Students at strained schools were found to engage in violent offending as opposed to just partaking in lesser offences (such as truancy) (de Beeck et al., 2012). Another trait of strained schools is the prevalence of bullying and cyberbullying. Students who anticipated encountering these strains at school were more likely to use drugs and arm themselves with a weapon (Brady et al., 2020). Drug use was also high amongst students who dropped out of school and received adverse parental reactions (e.g., severed relationship), which led to despair (Drapela, 2006). Therefore, the repercussion of direct and indirect school strains is that criminal activity is heightened particularly for violent offending and drug use.

School-to-prison pipeline

The school-to-prison pipeline (Nocella et al., 2014)—the phenomenon in which students are pushed out of school and driven towards incarceration—describes additional factors that lead to the strain of dropping out of school. For instance, the implementation of zero tolerance policies (e.g., expulsion of a student upon a first offence like shoving another student), an increase in the presence and action of police officers in schools to handle school issues (e.g., to break up fights), the unwelcoming physical structure of schools resembling that of prisons (e.g., fences and lots of colourless concrete), and the enforcement of high stakes standardized testing, all support the pipeline and especially push those of certain racializations (i.e., black) towards incarceration (Bahena et al., 2012). Although, much attention has been drawn to the racism within America's justice system (see Alexander, 2010), Canada is not exempt, due to the glaring overrepresentation of Indigenous Peoples in the justice system (Conrad, 2014). Furthermore, in spite of the perception that compared to the US, Canada's educational system is "more benign, …[z]ero tolerance policies, surveillance systems, and school resource officer [i.e., school security guard] programs have been in place in schools in Canada" (Conrad, 2014, p. 4) for almost two decades now. According to pipeline discourses, the similarities between the physical

structure of schools and prisons, the surveillance systems, and authoritarian regulations contribute to grooming students for prison (Bahena et al., 2012).

Although the intent of added surveillance and strict rules is to create order within schools, the presence of the aforementioned factors make schools akin to prisons (Foucault, 1975/2005). Foucault's (1975/2005) panopticon gaze is a central component of a disciplining institution. The panopticon—an architectural invention used in prison systems—is a circular building that houses prison cells around its circumference and has a watch tower at its central point. Due to backlighting guards "can observe from the tower… the small captive shadows in the cells of the periphery" (Foucault, 1975/2005, p. 200). In other words, the panopticon allows one to supervise prisoners from the tower without being seen, cultivating a fear within the inmates that they are constantly being watched and forcing them to internalize rules. Therefore, the gaze makes discipline less about enacting brute force and more about converting one's fear of being watched to internalizing rules (Foucault, 1975/2005). The gaze applies everywhere as rules are often internalized due to a sense of the watchful eye of others. Although schools are not architectural panopticons, they are disciplining institutions where the panopticon gaze operates. Students enact "normal" behaviours and attitudes under the supervising eye of teachers and peers (Foucault, 1975/2005). More recently, the supervising gaze takes the form of surveillance cameras and law enforcement officers in schools. This surveillance is intensified in secondary schools because high school students are considered more of a threat than elementary students (Fuentes, 2014). Therefore, the measures that are used within schools are complicit in youth dropping out and turning to crime.

Synthesizing Perspectives on Youth Crime and their Implications for Schooling

Based on the theories that were discussed, there are a number of reasons why a youth would engage in crime—including a range of biopsychological and social stressors. Similarly, the role of schooling varies depending on the theory in question. Schools can provide coping mechanisms and additional supports for those with biopsychological disorders; they can be a powerful socializing force that positively bonds one to society; they can provide a safe bubble that inhibits one from being influenced by deviant others; and they can mitigate strains by fostering educational attainment. However, schools can also be a source of strains. As GST and school-to-prison pipeline discourses underscore, negative schooling experiences can push one

towards crime. Therefore, educational programs—including for-credit high school science programs—that are specifically available to youth who are involved in the justice system must maximize the benefits that schooling has on this population while reducing its negative effects.

Education and Rehabilitation for Those Involved in the Justice System

Educational programs are an integral part of Canada's correctional services. Moreover, youth are required to attend school until they are 16 or 18, depending on the province where they reside, which means that while they are in custody/treatment they are legally required to receive an education. However, the value of education is evident in that even adult offenders' highest levels of academic attainment are considered and assessed upon their entry into the justice system (Correctional Service of Canada, 2015). If they did not complete grade 12 (or an equivalent), they are deemed as having an educational *need* (Correctional Service of Canada, 2015). Based on this measure, "approximately three quarters of federally sentenced offenders present a need for educational programming" (Correctional Service of Canada, 2015, p. vi). Therefore, the programming that is offered to them is intended to address said needs; increase their literacy skills; enhance social cognition and problem solving abilities; give them a foundation to participate in rehabilitative programs; provide them with the necessary skillset to attain and maintain employment; and provide them with the supports that they need to abide by the law once they are released (Correctional Service of Canada, 2015).

Recidivism and Education

Given the correlation between low academic performance and recidivism (Katsiyannis et al., 2008); and that being arrested is connected to further delinquent behaviour (Wiley, 2015), it is evident that offenders need to make academic strides, which will increase their opportunities for employment and enable them to desist in crime upon their release (Stephens & Arnette, 2000). Indeed, those in the justice system who were engaged in educational programming, "had lower rates of conditional release failure compared to non participants" (Correctional Service of Canada, 2015, p. vii)—meaning that they were able to meet all of the conditions that restricted their activities once they were sent back to their communities. For all participants–including those who are Indigenous—the more educational achievements they earn, the better their release outcomes are (Correctional Service of Canada, 2015). For this reason, it is vital that teachers

work alongside offenders to recognize their educational goals and needs, and update their IEPs (Individual Education Plans) to ensure that: educational needs and career objectives are aligned to increase their odds of acquiring employment and remaining employed; to enhance their reintegration; and to support public safety (Correctional Service of Canada, 2015).

Education for Youth in the Justice System

In spite of the benefits of education—when it is well-implemented—for those involved in the justice system, there is a blatant disregard for the quality of schooling that is provided in carceral settings (George et al., 2014). George, Gopal, and Woods (2014) surveyed educational programs that are offered to those who are incarcerated in Ontario and based on their findings, they argued that there is a "lack of formal education programs for individuals on remand in Ontario[:]…a violation of their right to education" (p. 34). Although it is justifiable to limit some rights due to incarceration (e.g., freedom to live where one wants), unnecessary punitive measures that infringe on one's ability to learn via poor programming, retro resources, and a lack of funding for formal programming are unwarranted and discriminatory (George et al., 2014). Furthermore, the benefits of prevention and intervention programs—such as schooling/treatment—outweigh crime expenditures in the long-term (Correctional Service of Canada, 2015; George et al., 2014).

The imperative to provide youth who are involved in the justice system with educational programming is not only apparent in Canada, but also in the UK and US. Similar to the Canadian context, in the UK "the numbers of children in custody at any one time have dramatically reduced in recent years, whilst re-offending rates remain stubbornly high" (R. Little, 2015, p. 27) and for that reason, education has been placed at the heart of custody as an intervention for recidivism; and in the US, during the 80s the "Department of Justice began taking legal actions against state and local governments for not providing incarcerated youth with educational… services" (Houchins et al., 2009, p. 159). Although these nations have an awareness of the need for educational programming for youth who are involved with the justice system, the implementation of such programs has been wanting.

Little (2015) surveyed, interviewed, and held focus groups with 75 different young offenders to learn more about their educational experiences in the UK. The major findings of this study were that prior to engaging in crime, the youth had negative experiences in school and

were operating below grade level; there were limited courses, which deterred them from engaging; and there were additional barriers due to the student population (e.g., learning disabilities)/facility (e.g., not designed for educating) that inhibited learning. The participants desired "sampler courses," to get a sense of the topics that interested them and to help them navigate their future, because courses of interest and occupational relevance were not offered. However, the Raptor course, which focussed on field work with birds of prey consistently received rave reviews. Juxtaposed against the functions of management and meeting minimum legal obligations that comprised the other courses, this course provided positive learning opportunities and suggests that educational experiences with this demographic of youth should seek to foster positive personal developments through tasks that are meaningful to them (R. Little, 2015).

Houchins, Puckett-Patterson, Crosby, Shippen, and Jolivette (2009) explored the predominant barriers and facilitators to teaching youth who are involved with the justice system. By surveying 78 teachers that worked in justice settings in Louisiana, they found that there was an overrepresentation of emotional disturbances, learning disabilities, illiteracy/marginal literacy, and demotivation amongst youth in secure care. This was not helped by the budgetary restrictions that resulted in inconducive learning materials, poor facilities for teaching, and students being too high-risk to use certain items/materials that were considered contraband (e.g., a paperclip) (Houchins et al., 2009). The following strategies were found to facilitate learning: using tasks that gave students a choice, such as choosing a research topic that interests them; connecting what is taught to what is relevant to the students; and counselling and behaviour management. Overall, this study revealed that youth who have been involved with the justice system face a number of challenges when it comes to learning, which require attentive teachers and cannot be met within learning environments that have a high student-teacher ratio (Houchins et al., 2009).

Conrad's (2014) experiences with the education afforded to incarcerated youth in Western Canada, concur with the findings from the UK and US. Her research used participatory drama with justice involved youth to educate them with the hopes of reducing reoffence. She described the many strains that incarcerated youth faced, including: living in abusive situations, (neglect/physical/sexual/mental abuse); having been disengaged from school; and living in domestic environments where crime, violence, and substance use prevailed (Conrad, 2014).

Although the drama program faced many challenges due to the nature of the students, the location, various restrictions (materials, censorship, etc.), and having a transient class—which interfered with their ability to perform the skit, due to the release dates of two of the cast members—the youth expressed positive engagement. Conrad (2014) articulates the struggles that she had with teaching by stating that the environment was "so heavily rule-bound and coercive, with a focus on containment, reward (by point system) and punishment, that there was little room for meaningful personal development to occur; it was an environment antithetical to the aims of education for personal and social development" (p. 10).

Youth who are involved with the justice system via secure care or treatment facilities are not representative of a conventional classroom, which impedes teaching and learning. These youth have negative experiences with education (R. Little, 2015) and are functioning below grade level (Correctional Service of Canada, 2015) with low literacy levels (Fisher, 2001). The learning environments often have inordinate restrictions—when compared to conventional schools—that inhibit learners' growth (Conrad, 2014). Furthermore, demotivation and learning disabilities, although common challenges in traditional classrooms, are pronounced issues in these specific educational settings (Houchins et al., 2009). In addition, logistical obstacles include not receiving prior academic information, intrusions to class time due to court hearings/therapy and a temporary class roster because of transfer placements and release times (Conrad, 2014; Houchins et al., 2009).

A number of measures taken by educators of those who are involved with the justice system have been found to address these challenges. For instance, making immediate contact with their students' previous schools to attain students' academic histories; setting aside daily instructional time; and ensuring that the content matches the official curricular expectations as opposed to lowering the bar, aid students in secure settings (Quinn et al., 2016). The need for individualized education was found to be an asset since students were at various points in their schooling (Meltzer et al., 1984). Lastly, smaller class sizes were found to be beneficial, specifically for youth with learning issues (Quinn et al., 2016). These strategies enable students to continue learning in spite of the restrictions and setbacks that they may encounter.

An integral part of teaching youth who are involved with the justice system is care (Wright, 2004). In his exploration of the educational programming that is offered to justice involved youth in the western provinces, Wright (2004) surveyed and interviewed teachers to

understand the role that care has in their students' success. To the educators, care was defined as assisting students with identifying their goals, being genuinely concerned for them, helping them improve their self-worth, having a sense of responsibility for their success, being respectful, building a community, going the extra mile when needed (e.g., at Christmas), and going beyond sympathy to acting. The teachers who cared about their students were able to gain their trust and support an "environment where students can try new things without fear of making a mistake, or being ridiculed, [which] is conducive to creativity and personal growth" (Wright, 2004, p. 196). Echoing this sentiment, Conrad (2014) states, "there is a need for more appropriate intervention-focused programming… founded on… caring and compassion to better meet youths' needs" (p. 14).

Alternative Schools

Alternative schools have the capacity to foster caring relationships between students and teachers through their conducive low-student teacher ratios and democratic processes. In their review of alternative schools in Canada, Bascia and Maton (2017) describe these schools as being less populous (having approximately 100 students total), which results in "small… class sizes that allow for personalized relationships among staff and students" (p. 3). These smaller class sizes (approximately 15 students per class) are conducive to the specific foci that an alternative school may have, such as: an academic focus; an emphasis on trades; or a transitional climate, catering to "students who… left mainstream schools and may wish to return" (Bascia & Maton, 2017, p. 4), which includes youth involved in the justice system. Regardless of the focus of the school, a key feature that distinguishes alternative schools from traditional schools is the use of democratic practices (Bascia & Maton, 2017). Secondary alternative schools in particular require educators to teach more than a single subject area, which creates demanding schedules: However, teachers have greater autonomy in what is taught and how it is taught, and students are given an invitation to provide input on their learning. This democratic process fosters innovation, although, "teachers ha[ve] to walk a fine line between the priority of delivering curriculum that students f[i]nd engaging and ensuring that students earn… the credits required to graduate" (Bascia & Maton, 2017, p. 8).

However, alternative schools present several challenges particularly for teaching science, which include: not having a science department, a lack of facilities, the inability to conduct labs,

and disinterest from the student body (Bellomo, 2017). Describing her experiences as the only science educator in a Toronto alternative school where she taught for seven years, Bellomo (2017) stated, “I was considering the ways to engage students, to motivate them to learn science…[B]y rejecting the regular school and coming to an alternative one, many needed further…help to be able to successfully enter and navigate the science sub-culture” (p.134). Students’ engagement was critical as those enrolled at her school came late, skipped class, failed to submit assignments, and challenged teachers (Bellomo, 2017). It did not help that the small school “had a less-than-adequate laboratory facility, limited equipment and materials, and no real library” (Bellomo, 2017, p. 138). To overcome these challenges, Bellomo (2017) had to use her own materials, borrow resources, reach out to science consultants for help, and become creative. For instance, instead of conducting labs her students were given data for a particular experiment, and they were expected to analyze the results (Bellomo, 2017). Although Bellomo (2017) describes her gratitude for being able to teach science in an alternative school and although she attributes her professional growth as a teacher to said experiences, it is unclear how well her methods worked for those who were least engaged because she never revisits that issue.

Describing the topic of engagement at another alternative school Novogrodsky (2017) problematizes whether disengagement is embedded in the essence of alternative schools. She explicates the tension between different views on the purposes of alternative schools in the following quote:

> What, if anything, should be required of students and staff at an alternative school[?] By the end of my first year, some staff and students wanted it to be a more purposeful school in which academic learning would be valued and encouraged. Some others wanted the school to be more therapeutic, a setting in which students from… overly monolithic and demanding public schools could recover and, without a designated time frame, set their own directions (p. 97)

The dichotomy presented in this quote is that either alternative schools are to focus on academics, in which case the issue of engagement must be at the forefront; or alternative schools are to be therapeutic implying that earning credits is not essential. The acceptance of the latter option at her school is evident in that “when students did come to school, many spent most of their time playing bridge with staff members or merely relaxing in the student lounge” (Novogrodsky, 2017, p. 97). Therefore, without being coerced to attend class, students had the

liberty to relax and due to this laid back approach, “some students failed to earn a single high school credit in an academic year” (Novogrodsky, 2017, p. 97).

Juxtaposed against those who do not attain academic achievements in alternative schools (i.e., passing courses, earning credits, and graduating) are cases of students who thrive in that environment. Novogrodsky (2017) shared a story of a secondary student who had social difficulties and often stayed under her desk when she felt uncomfortable. Her habit of going beneath the desk was deemed an acceptable behaviour by her teacher *and* peers, who gave her space when she went for cover. The alternative school “was a wonderful place for the girl on the floor who later…became a professional journalist” (Novogrodsky, 2017, p. 53). In this case, the ability to go at her own pace, without being forced to do a specific task, allowed the student to recharge under her desk when she needed. Therefore, the liberties that are available to students at alternative schools could enable students to avoid schooling or support their academic endeavours, depending on how they utilized their freedom. Therefore, alternative schools are not for everybody (Novogrodsky, 2017).

Three Pedagogical Approaches that Work for those Involved in the Justice System

Although youth who are involved in the justice system may transition to an alternative school—during their custodial time and/or if they are mandated for treatment—they may be required to attend schools/programs that are strictly for young offenders. Within these environments there have been notable pedagogies that have demonstrated educative and rehabilitative success with those who are involved in the justice system, which include experiential learning, as utilized through wilderness adventure therapy; outdoor and environmental education; and Indigenous education. These approaches are of particular interest due to their use at HOPE and also because of their continued use in the education and rehabilitation of youth who are involved in the justice system. Attributes of each of these interventions may be found in the others because they have intertwining beliefs that underpin them, similar locals, and the same adolescent population. The following explicates these pedagogies and their successes.

Experiential Learning and Wilderness Adventure Therapy. Wilderness adventure therapy has been frequently employed to aid youth who are involved in the justice system, yet

there are misconceptions about what it involves. For starters the term wilderness can have many meanings, often conjuring images of rugged landscapes that are void of people (Willis, 2011): These images are a fallacy when it comes to wilderness adventure therapy. Conceptualizing the wilderness as "pristine" leads to pitting it against places that are "tainted" by human habitation, creating a dualism with problematic implications (Willis, 2011). For instance, if rehabilitation occurs in the pristine wilderness, what happens when those who were rehabilitated return to their communities that are tainted by humans, pollution, noise, etc.? Instead of thinking of the wilderness as a pristine other, the term when used in Canadian wilderness adventure therapy contexts, simply refers to remote regions that are less populated (Harper et al., 2018; Ritchie et al., 2016).

Wilderness adventure therapy combines several pedagogical strategies. Mainly kinaesthetic, reflective, experiential, and expeditionary approaches are applied in this form of therapy (Harper, 2017; Ritchie et al., 2016), along with parallel processes—such as using outdoor challenges (e.g., going through a ropes course, climbing a mountain, hiking, etc.) to parallel challenges that the participants may be facing (e.g., issues with giving up) (Frandzel, 1997). It employs a "slow pedagogy" in which participants learn, reflect, and share at their own pace (Harper et al., 2018). Specifically in Canada, there are "efforts to heighten environmental awareness, increase place-and land-based learning opportunities and to recognise Indigenous knowledge" (Harper et al., 2018, p. 152). Resulting in an emergent use/appropriation of land-based learning, snowshoes, talking sticks, canoes, trail routes, etc. in ways that recognize their Indigenous origins and pay homage to traditional ways of knowing (Harper et al., 2018). The use of Indigenous inspired approaches is relevant to the clientele as those in the justice system include a significant amount of First Nations, Inuit, and Métis youth (Russell & Farnum, 2004).

The solo is an example of a land-based and slow pedagogical tool: Solos require one to find a spot in the woods, plain, etc., that is detached from technology and others for a time of reflection (Russell, 2006). The client picks their spot and determines how long they will be out on their solo. In this manner, participants have autonomy in wilderness adventure therapy, refuting the misconception that it is a type of boot camp for wayward youth, where harsh embarrassing punishments and aggressive verbal abuse are accepted occurrences. Bootcamp and wilderness adventure therapy should not be conflated, as the latter is based on encouragement

and working together through challenges (Russell, 2006). Thus, this form of therapy necessitates collaboration and teamwork.

Participating in wilderness adventure therapy has additional benefits. Other treatments (such as a 12-step program) can be mechanistic or based on stages. However, wilderness adventure therapy is less scripted and more self-directed because those involved are neither forced to speak at each session nor to deal with a particular area of struggle before tackling another issue (Russell & Farnum, 2004). Youth are frequently attracted to the novelty of adventure therapy, viewing it as fun (Conlon et al., 2018). Due to the active nature of this form of therapy a primary benefit is improved physical health (Russell, 2006). Eating nutritious foods on a regular basis, getting enough sleep, and abstaining from drugs, all factor into healthier clients (Ritchie et al., 2016). Increased self-esteem was another plus associated with wilderness adventure therapy (Shanahan et al., 2009), as well as, reduced stressors, such as noise, crowding, and negative influences (Russell & Farnum, 2004). However, being in the wilderness can be a culture shock for youth who are accustomed to metropolitan spaces, cellular reception, and data. Furthermore, studies on the affects of wilderness adventure therapy on recidivism have varying findings, ranging from no significant results (Jones et al., 2004) to lowered persistence in crime (S. J. Wilson & Lipsey, 2000). Overall, when compared to one-on-one therapy sessions, adventure therapy, "generally subscribes to a holistic approach to well-being" (Ritchie et al., 2016, p. 316).

Outdoor and Environmental Programs for Youth in the Justice System. Similar to adventure therapy, the therapeutic aspects of being outdoors and the educational gains that accompany learning in natural spaces have been used to help at-risk youth, those who have struggled with addictions and notably who are involved in the justice system. What distinguishes outdoor/environmental programming from wilderness adventure therapy is that the former does not entail adventurous expeditions. In the past, it was common for those who were convicted to spend time outdoors farming as "prisoners originally did garden work to provide food and… to defray operating costs" (Richards & Kafami, 1999, p. 186). Recently, there has been a resurgence of outdoor programs in carceral settings, however, these types of programs are implemented for the purposes of science education/rehabilitation (Richards & Kafami, 1999). These programs are faced with numerous challenges including a lack of resources and funding,

security considerations, and a transient population (Timler et al., 2019). Therefore, to mitigate some of these challenges, programs are often multipurposed.

In British Columbia an organic gardening program has been providing purposeful work for men who are incarcerated, while addressing food scarcity by the donation of the crops to local communities (Timler et al., 2019). Depending on their position, the "inmates receive between $1.00–$6.90/day" (Timler et al., 2019, p. 445). An ethnographic study on this program that entailed observations and interviews, revealed that: the garden reaped physical benefits for those who tended it, by giving them exercise and by supplementing the low nutrient foods that were provided at the facility; the work environment was tranquil; the inmates were able to take pride in what they grew; they had an increased sense of purpose—unlike other menial prison jobs—because they donated crops to impoverished communities; lastly, the men's self-perception began to change as they started to see a better life for themselves. Consequently, this program enabled them to maintain employment and build a routine, which will be necessary upon their release.

Other programs focus on the educational value of outdoor and environmental work, such as, the Sustainability in Prison Project that was created in Washington (Little, 2014). It is an initiative designed to help prisoners learn the importance of sustainability, while making prison practices sustainable, all through a partnership between the Washington State Department of Corrections and Evergreen State College (P. C. Little, 2014). This project has offered successful programming to adults that involves conducting ecological research, making prisons more sustainable through recycling, creating horticultural programs, and conserving biodiversity. It has been acclaimed for saving "correctional facilities millions of dollars by creating recycling and energy-saving programs" (P. C. Little, 2014, p. 367). Inmates who were involved in this program have praised it for increasing their opportunities to learn and for sparking their interest in the sciences.

The benefits of the Sustainability in Prison Project and garden/farming employment coincide with the positive outcomes of other similar prison programs. In a carceral facility in New York, a horticultural science curricula helped inmates to experience academic satisfaction (Coe, 2013). Women in correctional facilities in England and France praised the outdoor programs for improving their physical and mental health and for providing a sanctuary and respite from the prison environment (Baybutt & Chemlal, 2016). A horticultural program that

focussed on growing chemical–free plants was used to teach incarcerated addicts about substance abuse and was found to positively affect their fight with drug use (Richards & Kafami, 1999). Lastly, a recent eight year longitudinal study done on a greenhouse program in Riker's Island, New York, has shown that adult inmates who participated were less likely to reoffend upon their release (Linden, 2015). Thus, these types of programs have been linked to academic pride, positive mental and physical health, increased self-esteem, and decreased recidivism.

Indigenous Education. Indigenous education has been utilized to bolster the self-esteem of Indigenous Peoples who are involved in the justice system and to support their rehabilitation. Conrad's (2014) participatory drama research described the difficulty that she experienced while teaching in a justice facility, however, she noted that two other programs—extra curricular sports and the Native program—were well received in spite of similar challenges. Conrad (2014) recounted that "the Native program coordinator was able to develop close, caring relationships with many youth" (p. 9). The adolescents enjoyed the cultural and art activities that she organized; they appreciated the visits from Elders and guest artists; and they had a sense of achievement and acceptance because she displayed their work (Conrad, 2014). Although detailed data on the pedagogies that were used in the Native program were not collected, it is evident that the program was meaningful to the participants and that it promoted a rehabilitative space.

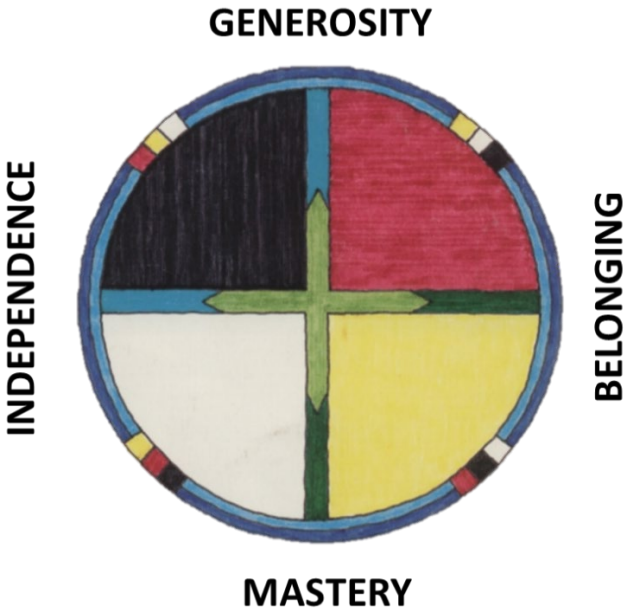
Another beneficial Indigenous intervention is the Pathways Program, which operates at a medium security prison in Alberta (Morin, 2018). Dale Swampy and Cory Bitternose—participants in Pathways, who have eight- and 10-year sentences respectively—attribute the program for positive transformations in their lives. Mr. Bitternose described having a very strained upbringing, marked with intergenerational abuse from residential schooling. On a daily basis the men in this program participate in smudging, prayers, and cultural teachings, under the guidance of an Elder, so that they can regain harmony in their lives. Their rehabilitative journey compared with the regimented routines that occur at the other prison units provides a stark contrast, but one that is deemed essential for "reducing Indigenous overrepresentation in Canada's prison system" (Morin, 2018, p. 1).

The application of Indigenous pedagogies with marginalized youth has been applied with efficacy. Although there is no panindigenous pedagogy, the Circle of Courage (Brendtro et al., 1991) model—proposed by Brendtro, Brokenleg, Van Bockern, and Bluebird—was developed

based on principles that are common to a number of Indigenous groups. The motivation behind the model was that "many traditional tribal communities were better equipped to meet the growth needs of children than… modern Western society" (Brendtro et al., 2005, p. 131). The central values of the model are that a positive educational culture include: belonging for everyone, through building trusting connections; mastery, through listening, playing, working, and problem solving; independence, through strengthening self-control and balancing ongoing social controls; and generosity, through developing empathy that is grounded in joy (Brendtro et al., 2005). Figure 2 shows the visual representation of the Circle of Courage Model.

Figure 2

The Circle of Courage Model (Brendtro et al., 1991)



The visual representation of the Circle of Courage model was designed by George Bluebird, a Lakota Sioux artist (Brendtro et al., 1991). He used the medicine wheel because it depicts being whole as it includes our physical, mental, emotional, and spiritual being. It also represents one "standing in a circle surrounded by the four directions" (Brendtro et al., 1991, p. 6), which speaks to being interconnected with our surroundings. This model is not hierarchical but cyclical and as a result one has never arrived at a pinnacle—i.e., learning in each area continues throughout one's life. Consequently, if one area is lacking the implication is that the

circle may be broken: The absence of belonging, mastery, independence, and/or generosity is indicative that the circle is in need of restoration (Brendtro et al., 2005).

Schools contribute to broken circles (Brendtro et al., 2005). For instance, bullying and alienation in schools prevent one from belonging. Although schools aim to support students in their pursuit of meeting curricular expectations, the competitive methods inherently set some students up to be "the losers" and the expectations themselves may be irrelevant, making the thought of attaining mastery preposterous. Furthermore, strict learning environments prohibit one from being independent because without being entrusted with responsibilities or choices, one cannot become responsible. Finally, when society equates one's worth with their wealth, opportunities for generosity are diminished and the ability to joyfully give to others is never experienced. Therefore, every aspect of the Circle of Courage model challenges conventional approaches to teaching, learning, and schooling (Brendtro et al., 2005).

Although the inspiration for this model was taken from Indigenous teachings, belonging, generosity, independence, and mastery are universal needs. These needs go beyond the field of education and connect to a number of other disciplines such as psychology, biology, and criminology, resulting in a consilience of research that validates the use of the four Circle of Courage needs for adolescents' positive development (Brendtro et al., 2014). Therefore, Van Bockern and MacDonald (2012) argue, "schools that fail to provide opportunities for belonging, mastery, independence, and generosity are toxic to children. In other words, if schools are not working to meet the needs of children, they are not working very well" (p. 14). Thus, a pedagogy that considers the holistic needs of the learner (physical, mental, emotional, and spiritual) through belonging, mastery, independence, and generosity fosters an educational environment that is conducive for all learners (Brendtro et al., 1991, 2005).

Summary of Key Elements of the Literature

I presented a diversity of literature in order to understand the larger context surrounding for-credit high school science experiences that are offered to youth in the justice system. Therefore, the literature review contains: a summary of Canada's science education, in which approaches to teaching and learning science are problematized; a description of Canada's youth justice system; a presentation of different perspectives on why youth engage in crime, a synthesis of those views, and an outline of the implications of those stances on schooling; and an overview

of educational and rehabilitative programming for youth who are in the justice system. In doing so, I highlight that young offenders' experience strains that include biopsychological and social stressors, which pressure them into crime. Furthermore, schools can exacerbate strains via negative experiences such as bullying, alienation, negative relationships with teachers, and failure. Science subjects are complicit in strain production as they are difficult and present extra challenges for marginalized groups. For instance, the neocolonial exclusion of Indigenous knowledges from science classes force students to ignore and/or abandon their worldviews in order to experience academic success. However, successful approaches to science education that benefit marginalized groups counteract these strains and include culturally relevant teaching and Indigenous knowledge integration; citizen science and place-based education; hands-on science and inquiry-based learning. Congruently, these effective approaches to science education overlap with beneficial pedagogies that have been used with those in other justice system programs such as outdoor education and Indigenous education. Consequently, programs that reduce and mitigate strains have proven to aid those involved in the justice.

Conceptual Framework General Strain Theory

Although the view of education as "the great equalizer" has not materialized (Moss, 2009) and it has been argued that schooling reinforces divisions of class (M. W. Apple, 2004), it remains a positive good, not only for students but also for the continuity of a complex society from one generation to the next (Dewey, 1916). Therefore, its potential to facilitate personal growth through collaborative means can help to alleviate one's strains. For instance, an education can give a strained individual the skillset to make informed decisions, access support resources (e.g., mental health supports), and enter the workforce. Based on that logic, schools—and in turn teachers—have the potential to combat strains.

Indeed, a review of the literature found that effective educational programs empowered those involved with the justice system. Participation in those programs was indicative of reduced chances of reoffending. Although there are a variety of educational interventions, much of their fortitude and ability to alleviate strains is affected by educators. Teachers' support of students was found to be essential for mitigating strains and more influential than support from peers; and similarly, perceived teacher fairness (i.e., the belief that a teacher treats one in an equitable manner) and rule fairness (i.e., the view that the rules at the school are just and equitably

enforced) were linked to less delinquent behaviour based on students' self-reports (James et al., 2015). Therefore, schools can be a source of transformation for youth who are involved in the justice system.

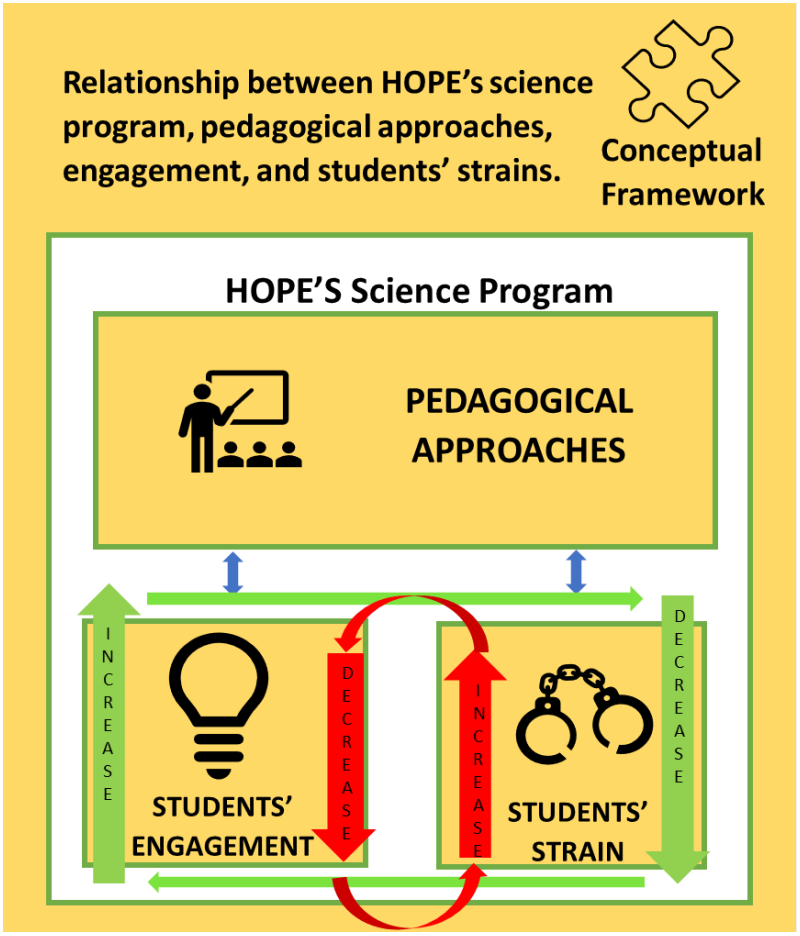
However, schooling can—and has been—a source of strains. Although adverse secondary experiences and dropping out of school are correlated with delinquency, a strained school culture is correlated with violent offending as opposed to lesser offences. Along with the culture of the school, teachers play a significant role in producing stressors, as negative relations with educators were found to be a predictor of criminal activity. These findings are consistent with the school-to-prison pipeline phenomena—in which students are pushed out of schools and towards crime—in that they connect schooling and criminality in a manner that schools are accountable. Thus, schooling is complicit in youth crime.

In a paradoxical manner, schools have the ability to mitigate strains *and/or* aggravate them; however, tantamount to this—and further complicating the educational experiences of strained individuals—is that strains have the ability to interfere with schooling. Financial strains can lead to dropping out in order to work, emotional strains can distract one from learning, and negatively valued stimuli such as gangs can make truancy—and eventually dropping out of school—appealing. Although strains present a variety of barriers to learning, ranging from an inability to focus to absenteeism, pedagogies that have been proven to work with strained individuals seem promising. By furthering strained students on their educational and rehabilitation journey, these pedagogies are part of the solution.

Drawing on the relationship between strains, engagement, and pedagogy, I created the conceptual framework in Figure 3. It depicts the interconnection between strains, students' engagement in schooling, and pedagogical approaches. Students' strains encompass external strains, such as an abusive home environment and school strains such as a lack of teacher support. The red arrows indicate a parasitic relationship in which an increase in students' strains can cause a decrease in class engagement (e.g., disinterest, falling asleep, skipping class). In a cyclical fashion the weakening of students' engagement strengthens strains, as students fail to meet the course requirements. For instance, a student can disengage from their schooling as a result of negative experiences with their teacher, which can prevent them from asking for aid, and eventually lead to falling behind their peers and/or failure. Consequently, as strains increase, engagement in schooling decreases.

Figure 3

Conceptual Framework: Pedagogical Approaches, Strains, and Engagement



Juxtaposed against the parasitic increase-in-strain relationship is the symbiotic relationship that occurs when engagement increases, and students' stressors decrease (depicted with green arrows). One indicator of engagement in schooling is active participation in learning, which can mitigate school strains. For example, paying attention and receiving guidance from the teacher can prevent failure and support future opportunities. This, in turn, can alleviate the strains associated with failure or a lack of educational attainment. Similarly, a decrease in external strains removes the inhibitors to learning that are caused by stressors and promotes the learner's physical, mental, emotional, and spiritual readiness to learn. Thus, an inverse

relationship exists between strains and engagement, such that when engagement increases strains decrease.

The conceptual framework depicts that pedagogical approaches can affect students' strains and their engagement. Depending on the types of pedagogies that are used, students' engagement can increase or decrease and correspondingly, the types of pedagogies that are used can exacerbate students' strains or alleviate them. The use of culturally relevant teaching is a prime example of pedagogies that can increase engagement and mitigate strains. Culturally relevant teaching welcomes students who have been alienated from learning (due to content and methods that disparaged and/or ignored their cultures) and by affirming their identity and beliefs, mitigates the strains of a negative school experience. Nonetheless, pedagogical strategies can intensify strains. For instance, a student who is behind in literacy can get frustrated with repetitive tasks and assessments including those that require short answer questions (which is the predominant form of science assessment in Canada (see Chu & Fung, 2020)). This is especially problematic for courses like science, in which these methods erroneously assume the student's inability to read and write reflects a lack of understanding of the topic and in which the continued use of said assessments favour students whose strengths are displayed in completing that type of assessment (Chu & Fung, 2020).

Therefore, from a teaching and learning perspective, pedagogical strategies must consider and adapt to students' experiences of strains and their learning engagement. All students should have the opportunity to learn in a safe, constructive environment where strains are minimized. This means that classes like science in which anxiety, frustration, and doing poorly have been traditionally linked (Mallow & Greenburg, 1983), need pedagogical strategies that lessen these strains. For students who are experiencing a high level of strains outside of school, positive learning experiences in school are not merely for academic success, but also for providing students with a safe space, thus reducing potential to act on strains and pursue crime (Moon & Morash, 2013).

Applying this framework to my research, I start with students' strains. I identify the specific strains that documents on HOPE stated and that HOPE's teachers and staff mentioned. Next, I determine staff and teachers' perspectives on how those strains affected students' schooling, with an emphasis on science education. I explore the pedagogical strategies that were utilized in HOPE's science courses, the rationale behind their use, and their outcomes. In doing

so, I explicate the relationship between those pedagogical strategies and students' engagement. Similarly, I explore the connections between the pedagogy that was used and its role in exacerbating and/or alleviating students' strains. I utilize the implications from the different perspectives on why youth engage in crime (i.e., views of different strains and the role of schools), as a suitable lens for examining the reciprocal affects of strains on HOPE's science programming.

In the following chapter, I connect this framework to the case study methodology that was used. The HOPE case is then explicated, and the methods are described starting with the ethical considerations. For the reader's convenience, the methods are organized by the phase of the study to which they pertain—i.e., document analysis, interviews, and field observation; thereby, giving a detailed understanding of how data were collected and analyzed.

Chapter 3: Case Study Methodology

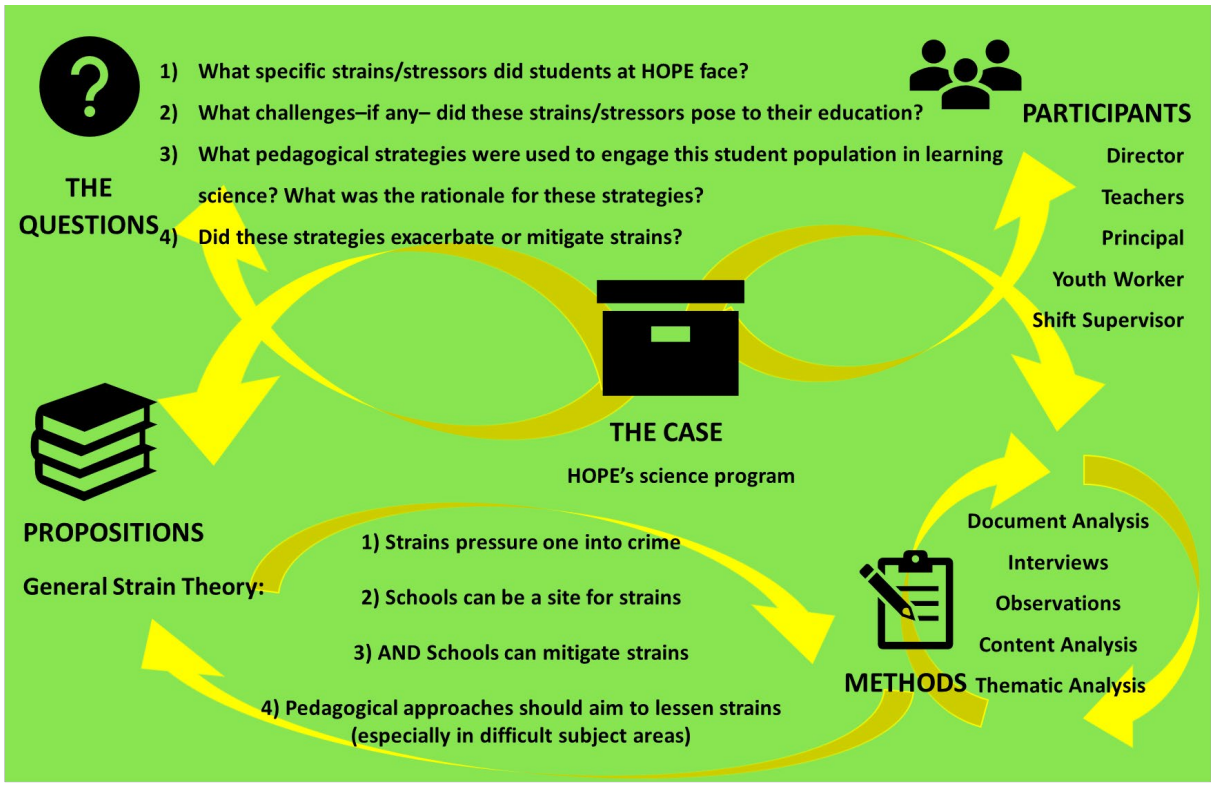
In this chapter, I describe the case study methodology and methods that were used to determine the type of strains that HOPE's students experienced, the ways said strains affected their science education, the pedagogies that were utilized, and the relationship between pedagogical approaches and strains. I present the methodological framework prior to detailing the HOPE case to give the reader a general overview of the methods. Next, I recount the ethical considerations, use of triangulation, and the definitions of each phase of the study. Finally, I provide a detailed description of the collection and analysis of each data source. For a better understanding of how I apply the case study methodology, I begin by presenting a general understanding of case studies.

Case study is a methodology that is utilized to provide a detailed description of a system that is bounded (Merriam, 1999b). While not generalizable, case studies are valuable because they allow one to learn from the experiences of others (Daniel & Harland, 2017). The case or the unit of analysis can be an individual, a program, a community, an intervention etc., but it must be delimited by either place, context, time, activity or by a combination of the aforementioned (Baxter & Jack, 2008). In order to gain an in-depth understanding of the case, Yin (2014) posits five components of a case study: 1) the research question; 2) propositions, which are theoretical frames that guide the research; 3) units of analysis, which clearly describe the way the case is defined and bound; 4) connections, in which the data is linked to the propositions and 5) criteria for interpreting findings. Case study researchers adhere to common qualitative practices associated with preliminary aspects of the study, conducting the research, ensuring its validity, engaging with ethical issues, and addressing biases (Creswell, 2014).

The methodological framework centers on HOPE's science programming, the case of this study (see Figure 3). It includes the propositions, ethical considerations, and methods. Figure 3 illustrates that the case is surrounded by four key parts of this research: the questions, propositions, participants, and methods. The arrows indicate the connections between all aspects of the study and their ties to the case. The rest of this chapter further outlines these elements, elucidates their interactions, and describes the research methods in greater detail, beginning with the HOPE case.

Figure 4

Methodological Framework for the HOPE Case Study



The HOPE Case

The case in this study is HOPE's science programming. This case is bounded by the duration of the program (2005-2020). During this period, students were no longer in custody, but were recently released and mandated to have treatment at HOPE. This case encompasses all of the forms that science education transpired, including informal and formal engagement (curricular science); and all of the locations where students learned such as, inside the HOPE schoolhouse, outside on the HOPE site, and on field trips. Central to this case study, HOPE consistently offered for-credit science courses. This is telling: First, it is indicative that these students did not attain their science credits in regular/traditional school settings; and second, it implies that students wanted to take science at HOPE because they had autonomy during their course selection. Given the extra challenges that science presents when taught to youth who are involved in the justice system (due to added safety precautions), it is remarkable that science was

a popular course. Additionally, the literature review outlines that this subject is known for inducing anxiety due to its difficulty and that achievement disparities exist for specific marginalized groups (i.e., those racialized as Black; those with low socioeconomic status; First Nations, Inuit, and Métis students; and females). The summation of it all, makes the HOPE case of particular interest.

There are four main propositions that guide this study on the HOPE case. The first three propositions for this case are taken directly from General Strain Theory. These propositions include that: strains are a common experience of those involved in the justice system, as they pressure one into crime; schools can be a site for strains; *and* schools can mitigate strains. The fourth proposition of this case is a consequence of the first three and an argument within the school-to-prison pipeline discourses: pedagogical approaches should aim to lessen strains. Thus, the propositions pertain to each of the research questions as they delve into the strains that the students experienced, the challenges they presented to their education, the pedagogies that were used and the dynamic between those pedagogies and the generation/mitigation of strains.

Case Study Methods

Multiple methods and a number of data sources, including any combination of documents, artefacts, interviews, and observations are used in case study research (Baxter & Jack, 2008). The researcher brings the reader as near as possible to the case that is described, by having a number of data sources (Daniel & Harland, 2017). Detailed descriptions of the research methods and clear connections to the relevant theories enable the readers to understand the significance of the study (Hamilton & Corbett-Whittier, 2013), support transparency, and help to establish validity.

Ethical Considerations

Keeping in line with the Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans (Canadian Institutes of Health Research et al., 2018), I considered the following three principles when designing the methods for this case and when conducting this study: respect for persons; concern for welfare; and justice. I ensured that recruitment did not involve coercion. Participants were given information forms that outlined the study, repeatedly informed that participation was voluntary, and provided with my contact information as well as

my supervisor's and the research ethics boards' contact. (This study underwent a full ethics review at the University of Ottawa, the schoolboard that was associated with the HOPE school, and it was also reviewed by HOPE's umbrella organization.)

I could not recruit participants directly, instead recruitment forms were sent through the schoolboard. The schoolboard emailed the information forms to those who taught at HOPE and mailed the parent(s)/guardians of the students who had attended HOPE in the previous year. The schoolboard did not have contacts for students who were no longer in school, and the umbrella organization did not have contacts of any of the students once they left/completed the program at HOPE. The umbrella organization sent information forms to staff who worked at the HOPE site. Those who wanted to be involved in the study contacted me directly.

I provided free, informed, and ongoing consent. I encouraged those involved to ask questions throughout the process, I reminded them that they could leave the study at any point in time, and I also reminded them that they could strike anything they had shared from the record. I had different consent forms for teachers, parents/guardians, and the HOPE staff. Although no parents/guardians contacted me, I had pre-created assent forms for students. All consent forms were written in simple and accessible language. Due to the lockdown situation across the nation, I received permission from all ethics boards to collect digital consent.

I scheduled interviews with teachers and staff at a time that worked best for them. I ensured that it was not during instructional time, and I gave participants the option for how data would be recorded (audio recorded or simply jotting notes). Participants were also given the choice of the platform to use for the interview, since non-essential travel was restricted at that time, there were no face-to-face interviews. Interviews occurred over the phone or in a private password protected Zoom that utilized the waiting room feature as an additional measure to prevent outsiders from entering the meeting. The interviews were semi-structured to enable participants to discuss what was pertinent to them. Prior to conducting the interviews, I reminded each participant that their involvement was voluntary, they could stop at any time, and they could remove anything from the record. I provided them with time at the end of the interview to share anything else that was important to them. Lastly, I asked participants if they were available for member checking and followed up with a short email or call—depending on their preference—to safeguard against misrepresenting their views.

The document analysis and the field study also required ethical care. Pseudonyms were used when reporting in every phase of the study. I used publicly accessible documents as well as personal documents that I received consent for using from the teachers/staff. Since the school was no longer in operation, the field study was on experiencing what it was like to be at the HOPE site. I received permission to attend the camp and I stayed overnight. At that time, the umbrella organization was running a pilot program at the site for Indigenous land-based wilderness adventure therapy that was exclusively for young Indigenous men. The leaders and the participants were made aware that I was there to get a tour of the physical space and to learn about how it was used for the HOPE school's science activities. They understood that I was not there to research the pilot program. However, the leaders and participants welcomed me to join in the activities. I accepted when invited and I did not participate in any part of the pilot program if I was not directly invited. Participating was an added benefit because it gave me a sense of how the space was used by HOPE for wilderness adventure therapy.

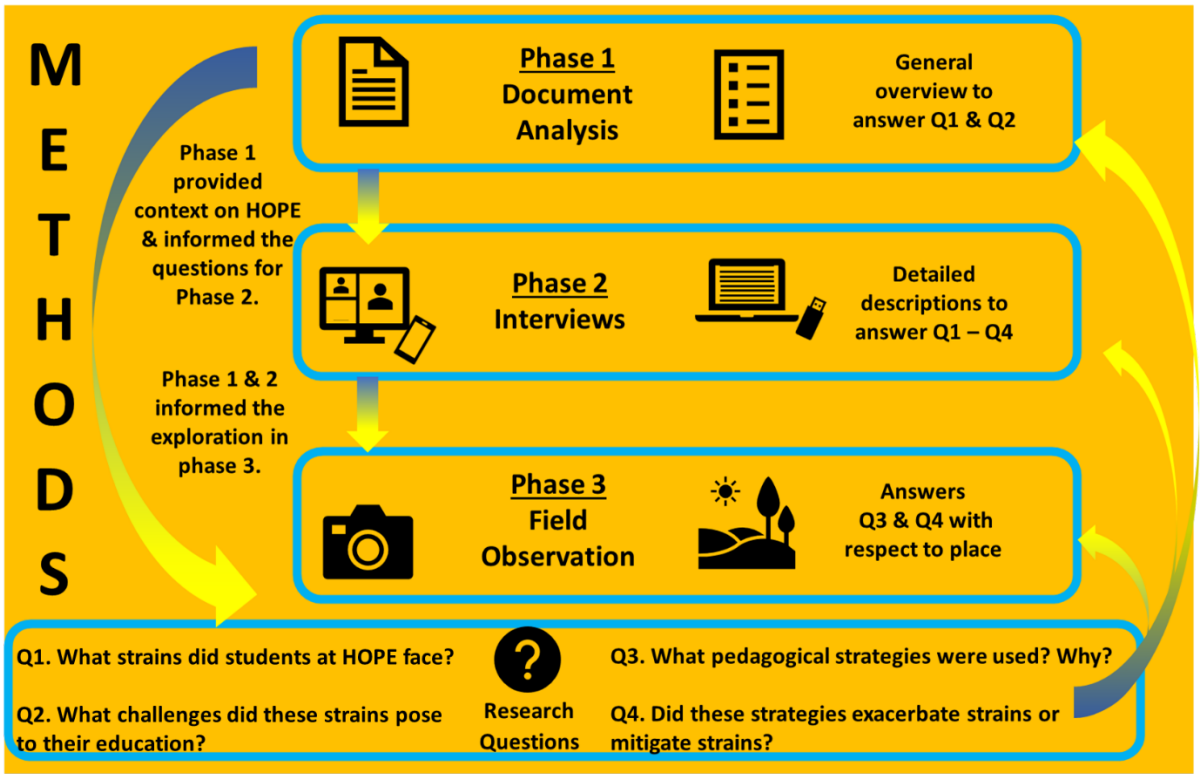
Triangulation

The field observation and document analysis were an asset to gaining a broader picture of what transpired at HOPE. A rationale for multiple methods is that it adds validity through triangulation (Jick, 1980). The major premise of triangulation is that "all methods have inherent biases and limitations, so use of only one method to assess a given phenomenon will inevitably yield biased and limited results" (Greene et al., 1989, p. 256). The multimethod approach allowed me to compare different perspectives on HOPE's science programming from various sources of data. The analysis occurred in a series of phases, as shown in Figure 5.

The framework for the methods illustrates each phase of the study and the research questions that were answered. You will note a progression in each phase, in which the results from the first phase of the study—document analysis—were used to inform the questions that were asked in the next stage of the study—interviews. The results from the first and second phases steered the focus of the field observations. Each phase played a role in providing answers to the research questions and in laying the foundation for the subsequent phase. The methods for each phase are explicated in the following.

Figure 5

The Research Methods for Each Phase of the Study and Their Links to the Research Questions



Phase One: Document Analysis Methods

Document analysis is a research strategy that involves a systematic review of documents (Bowen, 2009). It is an iterative process that consists of document retrieval, selection, detailed reading, examination, and interpretation (Bowen, 2009; Groenland & Dana, 2019). Documents are not limited to pieces of paper but include other forms of literary, visual, and textual works that present information (Coffey, 2014). Some examples of documents include: ads, webpages, journals, videos, and artwork (Groenland & Dana, 2019). Documents can be multimodal, meaning that one document can combine visuals, audio, and written texts. Thus, the availability of documents due to the various forms that they can take, make them a prevalent data source.

There are several other benefits of conducting a document analysis. For starters, documents provide a wealth of information including background context, prompting additional

questions, providing answers to the research questions, and triangulation (Bowen, 2009). Depending on the research question, documents may be a standalone data source (e.g., historical research) or they may be a supplementary source accompanying interviews, field observations, or quantitative methods. Document analysis is also unobtrusive, efficient, and cost effective (Bowen, 2009). It was particularly beneficial to this study because the HOPE school was no longer in operation. Since I was unable to observe classroom interactions, documentation of those interactions was useful.

Analysing documents involves several components. Typically, there is some criteria that must be met for a document to be included within a study. The researcher usually notes the type of document, the purpose of the document, the time it was produced, who it was produced for and who created the document, to better understand the context around it. Further analysis should encompass the social circumstances that the document was a part of and the discourses found within the document (Groenland & Dana, 2019). A simple and significant guiding question for the analysis is: What is the document doing? Additionally, it is helpful to ask: How does this document relate to others (Coffey, 2014)?

Although some researchers use the terms thematic analysis and content analysis interchangeably, they are distinguished (see Vaismoradi et al., 2013). I analyzed documents using thematic analysis and content analysis. A thematic analysis involves coding emergent patterns in the data as themes (Bowen, 2009). Whereas, a content analysis most commonly requires that the frequencies of the codes are tallied (Schreier, 2014). A coding frame may be used in content analysis, which contains pre-created codes that are used to keep the researcher's focus on the codes that address the research questions; however, a shortcoming of this method is that it may be too rigid and might inhibit finding additional information that is useful (Schreier, 2014). On the contrary, a thematic analysis supports open exploration of the data. Therefore, by using both techniques I was better equipped to highlight relevant information to answer the research questions. Thus, sources were coded with pre-created and/or emergent codes. For instance, the codes "strains" and "mitigate strain" were created *a priori* and applied whenever information was related to stressors in students' lives and reducing educational strains, respectively. I tallied the frequencies of codes to get a sense of commonalities between documents. I approached the interview phase and the field observation similarly, which made frequencies particularly useful when comparing findings between the different phases of the

study. In instances, when the coding frame did not apply—such as with the official statement on HOPE's closure—I noted key themes.

I collected documents from a number of sources including HOPE's umbrella organization's official webpage, an online news database, YouTube, and a Facebook Page about educational activities at HOPE. For each of these sources I describe the process I used for document retrieval, selection, and analysis. I also describe who created the document, what is its purpose, and who is the intended audience. I used content analysis/thematic analysis to learn more about HOPE's programming and to generate questions that could be answered in the interview phase of this study. I began the analysis with HOPE's official webpage, followed by documents that were found using the news database, then I moved on to the YouTube videos; and lastly, the Facebook page. The rationale for the type of analysis for each document and additional details follow.

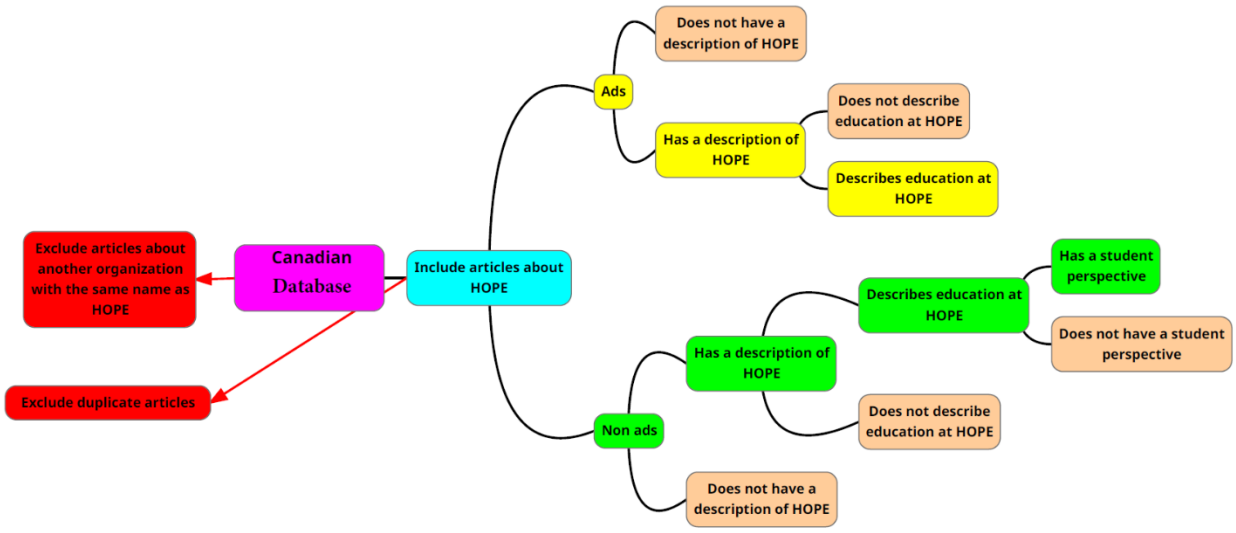
Document Type 1: Statement on HOPE's Closure. I discovered the Healing Outdoor Program and Education's umbrella organization's official webpage by conducting a Google search and using the name of the organization as the search terms. I navigated the site for any information on HOPE. Since HOPE ceased operations, data was wanting. The only mention of HOPE that was still accessible, was contained in the official statement on the closure. I took brief notes on this page, but I did not code any data. I included this document in the analysis because it provided contextual information on HOPE, and it hinted at reasons the program could not continue.

Document Type 2: News Advertisements and Articles. The news articles provided supplemental context on the HOPE site and particularly the HOPE school. The retrieval process involved using both the name of the umbrella organization and the school as keywords. The hits based on the name of the organization required filtering as several results were for an unrelated organization with the same name. I skimmed the abstracts and websites, using the find feature (Control F) to determine if the documents were related to HOPE, in which case they were downloaded and kept. The keyword search produced several duplicates, which were excluded. As I began to collect articles from this database, I encountered brief advertisement-like posts that were used to promote fundraising events. These ads were published in the newspaper of the

metropolitan regions nearest to where HOPE was located. I kept and analyzed these ads for their short descriptions of HOPE, with the rationale being a short word count would confine the authors to provide the most important descriptors. Figure 6 depicts the selection and categorizing of the advertisements and articles.

Figure 6

Diagram of the Categorizing and Selection of Articles About HOPE



I performed a classical content analysis and thematic analysis on these articles. First, I uploaded the articles into NVivo. Since the ads were brief, they were all part of a single NVivo project. The longer articles were uploaded as their own project. The preliminary round of coding involved segmenting the text based on the pre-created codes: what HOPE did; education at HOPE; strains/mitigate strains, and science education. I created nodes (markers for the codes) for the pertinent text and notes on questions/comments that they brought to mind. Once completed, I read through the ads again and created sub codes. For instance, I looked at all the codes on what HOPE did and I created nodes based on emergent themes, such as “wilderness therapy.” I defined the codes to ensure that their meanings did not drift. After one iteration of this, I realized that some of the articles contained students’ perspectives on their experiences of HOPE. I decided to chunk students’ perspectives because they provided another vantage point on the programming. Once no additional codes emerged, I completed the analysis.

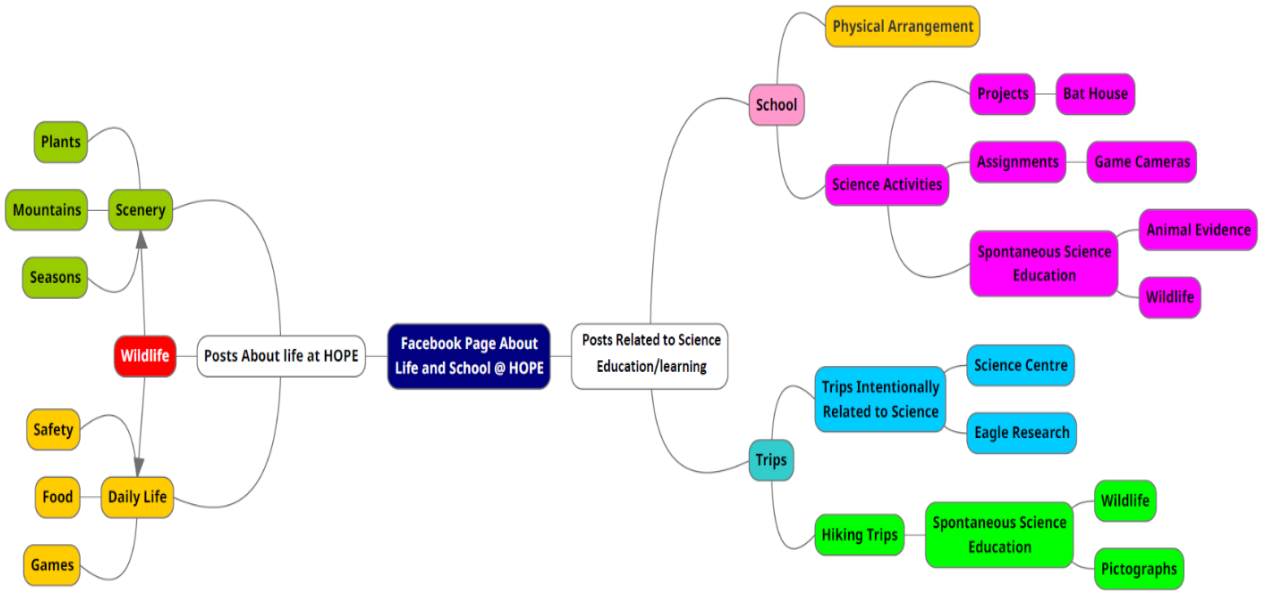
Document Type 3: Videos. The videos provided rich visuals of the physical space of the HOPE camp. Prior to analysing the videos, I vetted the videos to ensure that they were relevant for understanding HOPE and education at HOPE—and science education, in particular. Two videos met the inclusion criteria: One in its entirety and the other partly, in which case only the applicable section was analyzed. Both videos were created by the umbrella organization and edited before being uploaded. They were created to raise awareness about the programs and to fundraise. I analyzed the videos solely based on their audio (no visuals), then solely based on their video (audio on mute), and then with the combination of the audio and video. The rationale for a compartmentalized analysis was to focus on the audio and verbal discussions to make initial observations. This technique is similar to Heath and Luff's video analysis, in which prior to analysing the "visible or nonverbal aspects… [they]… generate some initial observations concerning the talk that arises in the fragment" (p. 6). Similarly, I wanted to focus on the images without the audio, the verbal communication without the visuals, and then see what stood out to me as I watched the video with the audio and visuals. I conducted a thematic analysis in which I noted emergent themes.

Document Type 4: Facebook Page and Facebook Albums. The active Facebook Page has a wealth of information on HOPE and particularly science education at HOPE. It is classified as an "Education" page. The brief note in the about section was a couple of lines that stated the purpose of this page was to showcase the different activities that were occurring at the HOPE school. The page had close to 100 followers and around the same number of likes. The last post was in 2015. In total there were 382 images, three videos, and eight comments. The procedure and organizational structure for the analysis of the Facebook page is found in Figure 7. All of the content was skimmed and quickly sorted into two main categories for the analysis: Posts about life at the HOPE school and posts that were specific to science education/learning at HOPE. A post was categorized as pertinent to life at HOPE if it did not have any obvious science education component (e.g., a picture of the sunset with no context/prompts for learning) and if the comments did not create teaching moments or share knowledge (e.g., "looks great!"). I analyzed posts about life at HOPE quickly to see if any new context surfaced. These posts had images and

videos of the scenery, wildlife, and day-to-day functions including pictures of food, games that were played, and safe practices.

Figure 7

The Organizational Structure for the Analysis of the Facebook Page



I did not create any new codes or use a classical content analysis for the posts about life at HOPE. Instead, I did a thematic analysis that was focused on providing new information about HOPE. The logic for this approach is exemplified by the numerous images of scenery and wildlife. I already had codes pertaining to wilderness (which encompasses the content of the scenery), therefore, if I created a code for forest and counted all of the images with forests, a high frequency would not provide new data. It is already apparent that forests were part of the wilderness landscape of HOPE.

The analysis of the posts that were related to science education and learning (i.e., posts that had people engaging in science activities, experiments, or were related to science content) was more nuanced (see Figure 7). I was particularly interested in the types of science pedagogy that were being utilized as this was related to my research questions. The arrangement of the classroom, other spaces where learning occurred, tools that were aiding learning, and cases of

interdisciplinary learning (e.g., outdoor education/STEM/environmental education and science) were also significant to this study. I organized the analysis based on the different albums that the Facebook Page contained. After skimming through each album, I inquired: Did the activities happen at school or on a trip? If at school, were they projects, assignments, or spontaneous (as indicated by the photograph's caption)? If they occurred on a trip, were the trips intentionally planned as science trips or did learning science happen spontaneously on hiking trips? After sorting the albums, I performed either a content analysis, a thematic analysis, or what I refer to as a thematic analysis on the physical space (spatial analysis).

The album that contained images of the school was coded based on an analysis of what occupied the physical space; hence, I refer to it as a spatial analysis. I divided the 1-room schoolhouse into eight regions that were determined by natural spatial divisions in the school, which included: bulletin boards, the bookshelf, the entrance, the whiteboard, and surrounding area, and the four corners of the classroom. This gave me a useful metric to analyze the types of learning materials that were present in the classroom. For instance, if a learning material was found in every region it was denoted by 8/8 and implied that this was a predominant pedagogical tool, rather than something that was found in only one region. Therefore, the album with images of the school enabled me to travel back in time to the classroom that once existed and provided insight on the types of teaching strategies that were used.

The analysis of the Facebook page included four additional albums: the game camera album, which contained pictures of a science project in which students set up cameras with the hope of getting footage of an animal; the animal evidence album, which contained clues that an animal was present and prompts to help the viewer deduce what animal was there; the wildlife at HOPE album, which contained pictures that were taken by someone (not a game camera) of animals that were right on the HOPE site; and the trips album, which documented field excursions. The purpose of these albums was to increase awareness of the shared space, to provide learning opportunities related to the wilderness environment, and to share what students had been accomplishing in science. My analysis of these three albums involved reviewing all of the images, listing the animals that were found, and noting the additional opportunities for learning that were presented through the comments. I looked at all of the images in this album, but I did not create new codes, because there were many images pertaining to wildlife, which would create a skewed frequency. Similarly, I reviewed the images in the trips album to

determine the types of excursions that students went on and the learning opportunities that were presented to them. I noted any common themes from the images in this album. I concluded the analysis when I had exhausted all themes.

Phase Two: Interview Methods

In order to further understand the research questions, I intended for interviewees to be purposefully selected. I wanted representatives from each level of the program, so that I could gain a wider vantage point on what learning science at HOPE entailed. For that reason, I sought to interview the teachers who were there for the longest time, a staff supervisor, a principal who had several years of involvement with the HOPE school, a youth worker, a director, and former students. The former principal of the HOPE school sent my recruitment information to those who taught at HOPE and the school board mailed the recruitment information to the parents/guardians of the students who attended in the previous year, to maintain the confidentiality of those who were in the program. The staff members who were employed by the umbrella organization, were informed of the study through a post on HOPE's private Facebook group. The recruitment text emphasized that participation was entirely voluntary and that there would be no compensation for participating. In spite of the concurrent lockdown situation across the nation, I was pleased to receive responses from seven people. However, one of whom was not involved with the day-to-day functions of the school—let alone the science programming—so rather than having a formal interview, she gave me a tour of the HOPE site during the third phase of the study. Everyone else met the inclusion criteria and served as key informants.

Prior to conducting interviews, I received participants' consent. I gave interviewees ample opportunity to ask questions and I repeatedly reminded them that their participation was completely voluntary. I explained that they had the right to withdraw from the study at any point in time. Due to the lockdown, I was very flexible with scheduling interviews, and I allowed participants to choose the platform that they preferred. Half of the interviews were over the phone and the other half were on Zoom. Interviews lasted one hour, with some taking up to half an hour more. All the interviews were audio recorded. Prior to the interviews, I looked at the new questions that emerged from the document analysis phase and designated each question to the interviewee that I thought would be best suited to field that query. I used this strategy, rather than asking all the interviewees the questions that came out of the document analysis, to not detract

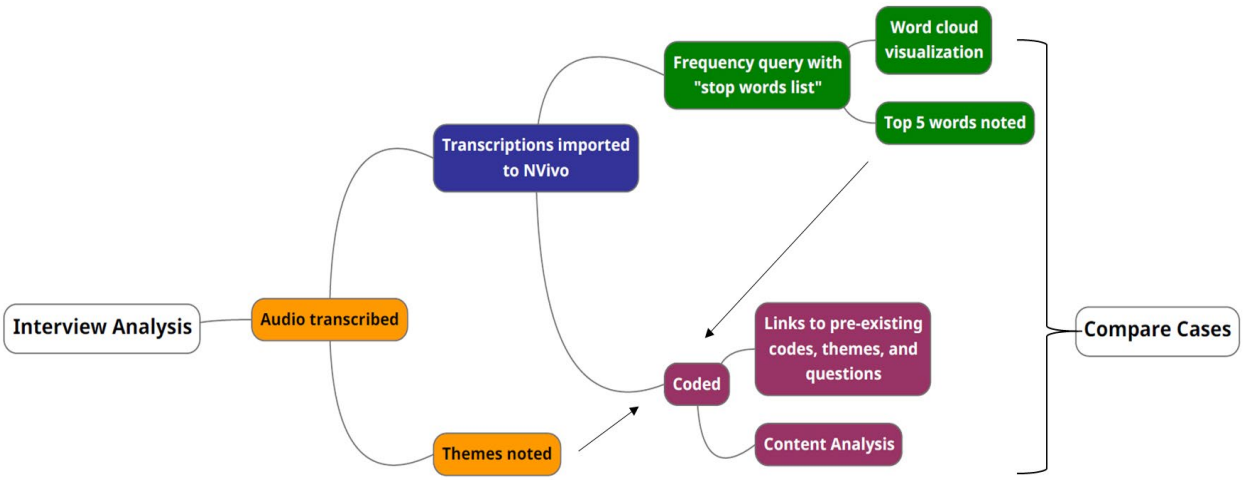
from the main research questions and to give interviewees enough time to share their stories. Upon completion of the interviews, I thanked the interviewees for their insights, and I reminded them that I would like to perform member checking (Merriam, 1999a) in the near future.

The analysis of the interviews began as the interviews were being conducted. Whenever a theme jumped out at me—a recurring theme, or even a new theme—I made a note of it as something to investigate further during the coding phase. Once an interview was completed, I transcribed the audio recording. As I transcribed, I had another opportunity to note any themes or answers to questions. Each interview was its own NVivo project and was analyzed separately from the others. I conducted word frequency queries to learn what words occurred most often in the discussion. Prior to the query, I took out filler words such as umm, right, yes/yeah by adding them to the "stop words list." Next, I created word clouds with the 75 most frequently occurring words to provide a visual representation in which the words that occurred most often are in a larger font size and the words that occurred least often are in a smaller font size. (NVivo also has the Tree Map feature, but I found word clouds to be more aesthetically appealing.) I jotted down the five most frequent words, words that addressed the research questions, and any words that seemed out of place; prior to identifying links between those words and pre-existing codes from phase one. I also included the word clouds in the results section (Chapter 4) to provide the reader with a visible overview of what topics occupied each interview.

Next, I began chunking the transcript and performing a content and thematic analysis. The *a priori* codes included: *strains*, *mitigating strains*, *challenges*, and *pedagogy*. I worked on one project before moving to the next. As I read the transcript, I created nodes for the *a priori* codes when applicable. I also created nodes for emergent themes and tried to code them in vivo—i.e., using the exact words or phrases that were in the transcript. New codes were defined and compiled with a list of the rest of codes. After the first round of coding was completed for the first project, I used the highlight feature to look at all of the excerpts for a particular code, to ensure that the codes did not drift. Next, I subcoded the *a priori* codes. For instance, I subcoded all the *strain* codes for the particular stressor that was mentioned, such as *addictions*. I repeated that process of checking for drifts for every node and subcoding for the *a priori* codes before I moved on to the next project and implemented the same procedure. If a new code was found, I went back to the previous projects to see if it had been mentioned. If so, I coded it appropriately.

I counted the frequency of the codes because it was a useful systematic measure to determine commonalities/discrepancies between interviews. Codes that occurred across all the interviews were viewed as a consensus in interviewees' opinions. Although codes with a low frequency may not have been as important to an interviewee, since it occupied less of their discussion, they were still an important finding. For instance, a code that had a high frequency in one interview but had a low frequency—or was entirely absent—in another interview was indicative of a discrepancy/a new vantage point on the topic. Furthermore, codes with low frequencies may also refer to an aspect of HOPE's science programming that was less dominant, but still present. In addition, frequencies enabled a comparison between the document analysis phase and the interview phase, which helped to triangulate findings. The semi-polished results from the interviews were returned to the interviewees as a form of member checking. A visual representation of the procedures for the interview analysis is found in Figure 8.

Figure 8



Phase Three: Field Observation Methods

The field observations began on the drive to the HOPE site. My phone was the main tool that I used to gather data. I noted observations, feelings, connections, and questions in it. I used the straightforward note-taking application and the 12 mega-pixel built-in camera. Along with these features, the convenience of its compact size made it my preferable choice compared to a physical notebook. I easily zipped my phone away in my pocket whenever I needed both hands

for a task and I quickly had it on hand whenever I wanted to document something. In any other location taking notes in my phone may have presented diversions, however, about five minutes after turning off the main road, I lost all cellular service and all accompanying distractions. When I returned home, I relocated the notes and images to NVivo. I highlighted key themes, however, I decided to journal my experiences to convey them to the reader in a manner that positions one as close to the site as possible through vivid descriptions.

Once the analysis of the field observations was completed, I compared each phase of the study. I considered the major findings from the three phases and combined them to tell the story of what comprised learning science at HOPE. In doing so, I oscillated between the research questions and the findings. To better understand the major findings, I present a chapter for the findings, prior to comparing phases.

Case Study Methodology Summary

This chapter describes the case study methodology that was applied in conjunction with the three-phase approach to the study. Using a case study allowed for a variety of data sources (such as online documents, Facebook albums, videos, interviews, observations, etc.) that pertained to the HOPE case. The triple phase approach—which included document analysis, interviews, and field observations—supported triangulation of the findings. The use of both deductive and inductive coding methods not only prevented me from losing site of the research questions as pertinent codes were created *a priori*, but also gave me the flexibility to note themes that were relevant to the documents' constructions of HOPE and the participants' views on science at HOPE. In addition, the frequency of codes provided a measure to compare findings from each phase of the research and between different data sources such as different interviews. The following chapter offers a detailed look at the results from each phase of the study.

Chapter 4: Documents, Interviews, and Observations: A Presentation of the Data

This chapter relays the data to the reader through rich descriptions of codes; excerpts from documents and transcripts; and a detailed retelling of my experiences during the field observation. I divided this chapter into sections that pertain to each phase of the study and each of these sections is subdivided based on the specific source of data (e.g., the type of document analyzed). I conclude each section with a brief summary that indicates key elements that were found within that particular phase. By presenting the phases in the order that they were conducted, the reader acquires insight on the progression of my understandings. The first section pertains to the document analysis phase and offers a wealth of contextual information and concrete examples of what science education at HOPE entailed. I build upon these understandings in the section on interviews, where participants offer invaluable and poignant descriptions that address the research questions. I supplement these data with the section on phase three—field observations—where I detail my remote wilderness experience at the HOPE site. I begin with phase one—document analysis.

Phase One: Document Analysis

This section presents the findings from the documents that were analyzed, which include the official statement on HOPE's closure, newspaper articles, videos, and the Facebook page. I provide contextual information on HOPE's programming—particularly what HOPE did—and I examine the types of strains and pedagogies that were utilized at HOPE. General Strain Theory and discourses pertaining to the school-to-prison pipeline phenomena guided the identification of strains and the acts of mitigating strains. They also provided a lens to determine whether the pedagogies that were used exacerbated or alleviated strains. I begin to explore the mutual affects of pedagogies and strains on each other as well as on students' engagement, however I develop this further in subsequent chapters. I also list new insights that were derived in phase one and advanced in phase two and three of this study.

The results are organized according to the document where they were found. The official statement on HOPE's closure provided contextual information on HOPE's programming and hints at the reason HOPE ceased operations. The articles offered additional context, insight on students' strains, and students' perspectives on the programming. The videos revealed more

about students' strains, wilderness adventure therapy, and what it was like to live at HOPE. Lastly, the Facebook page offered a wealth of information on the science pedagogies that were utilized at HOPE. Therefore, the documents are discussed in the order of broad contextual findings to specific findings on science pedagogies and strains—beginning with the official statement on HOPE's closure.

The Official Statement on HOPE's Closure

Along with the official statement on HOPE's closure, the umbrella organization's website provided context on the work that they do and their aims. I noticed that this non-profit organization offered a variety of community programs to young people and marginalized groups. Some of the umbrella organization's programs include addictions treatment, respite, foster care, programs for youth with FASD, and programs for youth in the justice system. Funding for these programs was also sought on this website through the promotion of fundraisers and an entire page that was dedicated to donations. Therefore, it was apparent that the umbrella organization strived to help marginalized youth and could not do so without the support of community members, volunteers, and funders.

The statement on the closure was brief (250 words). It contextualized the programming at HOPE and hinted at why HOPE ceased operations. HOPE was described as a wilderness treatment program that had a youth clientele (aged 12-17). Aside from this description, the statement did not offer anything that specifically addressed the research questions: Neither the school nor the partnership with the schoolboard were mentioned. Whereas reference was made to the partnership with the provincial health care service, which was described as cutting funding to the program in March 2020. Details about why funding was cut were not provided, so I explored that during the interview with the director. Although there was mention of wilderness adventure therapy and experiential learning to help clients along their recovery journey, it was unclear if those methods were utilized as part of HOPE's school. Based on an overall hermeneutic of the document, if one did not know that schooling was a part of HOPE's programming, the official statement gave no indication. Perhaps this omission was to emphasize the wilderness adventure therapy of HOPE's programming, since it was in a remote region, or maybe it was due to the word limit. Regardless of the reasons for the absence of the school, the document concluded with

a strong statement on the umbrella organization's confidence that the HOPE site will be used in the future to help marginalized youth.

News Advertisements and Articles: Building Context

Although the official statement on the closure did not explicitly mention the school, the news articles told another story and added perspective on the educational experiences of those who attended HOPE. The articles included five advertisements that were dated from 2005 to nearing when the program ended and two lengthier articles that I refer to as "non-ads." Even though some of the ads were brief, I considered what the document was doing to draw conclusions about HOPE. Overall, the articles revealed that the academic aspect of HOPE's programming was substantial to their success.

Of the five advertisements, three ads mentioned the name of the organization without any description of it. These ads were for golf tournaments that were raising money for several organizations. HOPE received funds alongside the local hospital, the local municipal library, drop-in shelters, foodbanks, the Ronald McDonald House, the local zoo, Habitat for Humanity, and Meals on Wheels. This is indicative of the community partners—some that are world renowned—that supported HOPE's vision.

The remaining two ads about events pertained to fundraisers that were either for HOPE or fundraisers where HOPE partnered with only one other organization. These advertisements were brief (200 words max), but they described what HOPE did. The resultant codes from the ads were *strain*, *wilderness*, *therapeutic programming*, *personalized education,* and *empowerment*. (The codes for these advertisements can be found in the appendix in Table 9.) *Strain* was the most numerous code and it pertained to the stressors that HOPE's clientele encountered. The code *therapeutic programming* was applied whenever therapy or counselling comprised activities at HOPE; the code *wilderness* referred to any mention of the outdoor activities at HOPE (e.g., hiking) or the environment; and the code *empowerment* described the way HOPE sought to build up marginalized youth by motivating them to reach their goals and helping them to increase their self-esteem.

The two descriptive ads listed the following strains, "addictions, mental health issues" and "other challenges." These strains were viewed as preventing the adolescents from meeting "their full potential" and they depicted HOPE's interventions as being thoughtfully "designed for

an individual" to move from "vulnerability to empowerment." The wilderness and therapeutic programming were vital to this process of transformation in that the wilderness was the classroom. Indeed, in four out of the five advertisements HOPE was described as a "wilderness school" that catered to youth who had strains. In addition, one of the ads provided more details on pedagogy by highlighting that the youth received a "personalized education." However—and contrasting the statement on the closure—therapeutic programming was only explicitly mentioned once. Based on these ads, it is evident that HOPE used wilderness programming that was personalized to the students, to empower them as they dealt with a variety of strains.

The non-ads–articles that had a greater word count–supplied more information on the type of educational programming that occurred at HOPE and offered the opportunity to glean from students' perspectives, because they contained quotes from students who were in the program. Of the two articles, one contained about 700 words and the other had just over 3000 words. The purpose of these articles was to inform the general public about the type of programming that was occurring at HOPE, which made these documents informative for this phase of the study.

Overall, there were 11 codes that were found in these articles. In order of most frequent occurrence to least frequent occurrence they are *student perspective*, which had related subcodes *achievement*, *awe*, and *student expresses personalized education*; *empowerment*; *wilderness*; *therapeutic programs; strain*, *experiential learning*, *personalized education*, and *relationship.* (These codes can be found in Table 10 in Appendix 1.) The codes *wilderness*, *empowerment*, *therapeutic programming*, *personalized education*, *and strain* have the same meanings that were described in the analysis of the ads. The new codes include *student perspective* and its subcodes, *experiential learning*, and *relationship*.

Student perspective pertains to any time a student was quoted on their experiences at HOPE. To garner a more detailed understanding of students' perspectives, this code was subcoded (see Table 11 in Appendix 1) such that *achievement* describes any reference a student made to doing well in a task or growing as a person; and *awe* encompasses moments when students were amazed by something they did, or they had their breath-taken away because of an experience. It is noteworthy that due to the closure of the school and the confidentiality needed for students who attended schools in the justice system, the only form of recruitment that was allowed required the schoolboard to mail my information forms to parent/guardians of students

who attended HOPE in the past year. In addition, the time of recruitment and data collection occurred during a period of lockdowns across the nation. Therefore, without student interviewees, these articles provided a needed supplement for understanding students' perspectives on HOPE.

The students who were quoted in the article clearly articulated that HOPE was a place where they could experience feats. They recounted, "accomplishing something" and being able to, "do something well." They even describe moments of achievement that prior to HOPE were not possible for them, such as "climbing a mountain" or "starting a fire." Their pride in being able to complete a six-hour climb is exemplified at the summit, where students carved their names in a shelter to commemorate the journey and to prove that they, "did it." Pertaining to that particular climb one of the boys enthusiastically commented that "the view was just wicked, man. You could see everything… I'd never seen anything like that, ever… there were thousands of names scratched in the [shelter]… I carved my name... We had to do that." His sense of accomplishment is palpable. However, what strikes me is that he indirectly points to the fact that HOPE provided many other marginalized adolescents with that very experience.

Other areas of success included "dealing with their problems" as opposed to "run[ning] away" and engaging in reflection, which one adolescent referred to as "learning it on our own through different experiences." A female client shared her experiences, "I got into trouble with meth and everything a couple of years ago…I've done lots of these programs…I almost left… but I'm glad I stayed. It's good out here." She went on to discuss the way that she dealt with her problems. She was optimistic about what was accomplished at HOPE, having a job lined up for her after she completed the program, she said, "I think, hopefully, this will be the last time I am in treatment." What is telling about her optimism is that she had experienced many treatment programs, but by staying at HOPE she got to the point where she felt she would not need to be in treatment again. She even stated that she "had to drop a lot of close people, because you know they won't change, and you just can't be around them." Her story is one of incredible transformation and achievement.

The code *achievement* had the highest frequency amongst the subcodes of *students' perspective*. An achievement that students described that was linked to mitigating strains was "dealing with problems." While the codes *achievement* and *empowerment* may seem similar, *achievement* is used solely for a student perspective and *empowerment* is used when someone

else describes a students' success. This distinction is to demarcate students' voices because there were no student interviewees. Similarly, the code *student expresses personalized education*, is differentiated from the code *personalized education* because it highlights that students—not just teachers—valued the use of individualized education. Keeping in mind that these students were strained, their ability to reflect on their education and to recognize practices that they benefitted from was a sign that they were engaging in their learning and metacognition.

The articles documented more strains that HOPE's students encountered. Addictions was a major strain. One student candidly said, "I didn't know I could… go a day without using drugs… When you are growing up, doing drugs all day long, that's what you become used to, that's what you know." Along with the strain of addiction, the students were often homeless and disconnected from their immediate family: They saw "their relationship with family deteriorate." Another strain was having entirely dropped out of school. The teacher who was quoted in the article said some of the kids had been "out of school for two years" and as a result "they were way behind." To address these needs HOPE offered schooling along with different modes of therapeutic programming that included wilderness adventure therapy, group counselling, individual counselling, family counselling and perhaps even spiritual practices. The extent of the spiritual practices is unclear from the article as one student remarked that, "they were passing this feather around and doing… weird stuff that I had never seen before" which made her consider leaving, but she went on to say, "I am glad I stayed." Thus, HOPE used a variety of treatments—including unconventional treatments—which coupled with novel educational methods provided a holistic approach to students' wellness.

To redress the youths' detachment from schooling, the articles noted that HOPE used a student-centred approach. This is reflected in the code *personalized education*, meaning that teaching and learning were personalized to each individual's needs. Even though the adolescents "attend[ed] daily classes, being taught [the provincial] curriculum" their learning experiences were unique because along with their for-credit programming: the wilderness was the classroom–and "an effective classroom" at that–where students engaged in *experiential learning* for their rehabilitation. Experiencing hardships in the wilderness was a tool that helped the students to identify their strengths and self-reflect. Therefore, the code, *experiential learning,* describes times when students learnt by experiencing/participating/trying different things or when they learnt by reflecting on an experience they had. The teachers and youth workers helped to

facilitate moments for *experiential learning,* and in addition, one of the articles noted that their role extended to "being a friend to the kids" and hanging out with them. The code, *relationship*, encompasses the positive student–teacher relationship that was fostered by living in community. Based on the articles, positive relationships, experiential learning, and personalized education comprised education at HOPE.

The codes from the news sources–ads and non–ads provided an overview of HOPE and the strains the clientele faced, but there was much more that needed to be explored. For instance, whenever an article referred to education, it underscored that academics were a vital component of HOPE, but it did not touch on any specific curriculum subject (e.g., science). Instead, articles referred to the unique educational experiences that students were given by learning in a remote location. In addition, I was unable to find any articles about HOPE's closure. I tried several databases and the metropolitan papers where information on HOPE was usually found but received zero results. This might be due to the overlap between the closure date (March 2020) and the nationwide lockdowns. However, I carried this question forward as a contextual piece that needed an answer and I continued collecting data from other sources.

Video Analysis: Viewing the Site

The analysis of the videos provided the first visuals of the HOPE site and a glimpse into the wilderness adventure therapy that occurred. There were two promotional videos that were contained in this analysis. The first video is a 5-minute snippet from a lengthier video on a few of the umbrella organization's programs and the second video is solely about HOPE. I recount the findings from the shorter video prior to sharing the findings from the longer video as the latter builds upon what was found in the former.

Short 5-minute Snippet

This video showcased a famous Canadian entertainer getting a tour of the HOPE camp. As I listened to the audio only, I noticed melodic background music that made me feel at ease. Through the discussions with staff and a student, several key descriptions of HOPE surfaced. HOPE was about "strengthening teens," "building communities," and "empowering young people" through "wilderness treatment," reiterating the codes *empowerment, wilderness,* and *therapeutic programming*. A student shared his views on HOPE, expressing that being at HOPE

was an “unforgettable experience” that helped him to “connect with his family… embrace changes… and to trust himself.” This student’s perspective shows the many ways that HOPE had empowered him.

As I watched this video without the audio, there were several images that spoke to a journey and a process. The beginning of this clip is in black and white for a few seconds, and it shows a staff member driving on a dirt road. It looks like a long drive, and it is apparent that HOPE is in a remote location. The camera zooms in on plaques with words of encouragement. The conversations between the famous Canadian and staff/students are done on the land. The scene changes to a mountain, giving the viewer a sense of the wilderness and how the clients had to persevere to climb mountains–literally and figuratively–during their time at HOPE.

Next, I watched the video again, but this time with the audio. I was analysing for anything new that I did not notice before and anything that was missing. What stood out to me was the mountain shot. It was perfectly aligned with the student (whose face was blurred out) speaking about having a “profound… and unforgettable experience.” This could be linked to the code, *awe*. However, this video did not have any shots of the school, just the outdoors. There can be a number of reasons why the school was excluded from this video. It may have been that the videographers did not want to interrupt class as it was in session, or perhaps they did not have consent to film all of the students. Fortunately, the school was filmed in the other video.

Longer Video on HOPE

The longer video of HOPE began with uplifting music that took on a calmer melody. This video featured a famous Canadian athlete whose mental health struggles began as a young person. As this famous Canadian was getting a tour, the philosophy of HOPE was articulated. An emphasis on “seeing people as people”–as opposed to seeing them as what they have done or what they do–was a clear message from this video. “New beginnings” and “transformations” were some other key points that were mentioned. Discussions pertained to the therapeutic aspect of being out in nature, wilderness adventure therapy, being in a remote locale, growth, community, and “being on a communal journey.”

Next, I watched the video without sound. The first scene is outdoors. It starts off as a dark and cloudy day. There are scenes of smudging, fire, laughter, community, and a sharing circle. At about a minute into the video the sun rises. The environment is picturesque. There are scenes

of an adventure ropes course, plaques with encouraging words, the school, a teepee, and people in conversations with active listening postures. The Indigenous inspired practices immediately jumped out at me because they had not been explicitly mentioned in the previous documents that were analyzed. Although, a student commented in one of the longer articles that "they were passing this feather around," which may have been alluding to Indigenous inspired practices. I created the code *Indigenous inspired practices* (See Table 12 in Appendix 1).

The video concluded with scenes of light breaking through the clouds and shining through the leaves of the trees. The symbolism of light was one of two symbols that came out of this analysis, with the other being taking a leap of faith. The audio analysis highlighted themes of change and growth, which I coded as *transformation*. Viewing the video with the audio, revealed an overlap between jumping off an apparatus in the ropes course to reach a target, and taking a leap of faith to reach a goal/change. Likewise, the use of sunlight seemed strategic and made use of common light analogies and idioms. For example: it is always darkest before the dawn, and light at the end of the tunnel–both idiomatic expressions–suggest that even though there is difficulty there is still hope. The use of sunlight in this video can be a form of pathetic fallacy. The cloudy sky at the beginning, may reflect the uncertainty of when one first arrived at HOPE, and the increased amount of sunshine overtime, could depict clarity and encouragement as the youth continued their treatment and schooling.

The interior of the school had a brief scene in the video. If one did not know it was a school, it could easily be mistaken for a museum. The contents of the classroom were almost entirely related to science. The room was filled with taxidermies; posters about wildlife; and questions and other prompts about biology, environmental education, and outdoor education. Though it is common to see posters in a science classroom and even a few manipulatives for learning, the arrangement of this classroom and the extent of hands-on learning material is notably beyond what I have experienced in traditional science classes. The unique features of the arrangements prompted a couple of sub-questions on pedagogical strategies, mainly:

- Why was the interior of the school akin to a science museum rather than a traditional classroom?
- What were the pedagogical benefits–if any–of that setup?

These questions and the new codes that emerged, affirmed the value of the videos in this study. Similarly, the use of Indigenous inspired practices had not been overtly described by any

of the documents that I had analyzed thus far. Yet, based on these videos it seemed as if it was a routine part of HOPE, one that required more exploration in the other phases of this research. Lastly, the videos provided a peek at science education at HOPE, suggesting the centrality of this subject through the design of the classroom. The analysis of the Facebook page and its albums, support the finding that science subjects were indeed a significant component of Education at HOPE and expound on what science pedagogy entailed.

Analysis of the Facebook Page: Diving into Science Education at HOPE

Science content on the Facebook Page was ubiquitous, however, the page also contained some photographs that pertained to the day-to-day activities at the site. One of the findings from these images was that the teachers partook in what I deemed *additional teacher's tasks*. This theme was identified due to several photos in which teachers were doing atypical tasks for the upkeeping of the physical environment and for taking care of the students (e.g., teachers usually cooked and had dinner with their students four times a week). The last theme that was repeated was *fun*. Although social media tends to put a spotlight on our happiest moments, based on the comments, captions, and happy faces in the photos, it was clear that there were a variety of activities that were enjoyed by everyone who was at the site–teachers, students, and staff alike.

Spatial Arrangement of the Classroom: Album with Images of the School

The Facebook page had an entire album that was dedicated to the interior décor of the school. In my analysis of this album, I found the types of learning materials that occupied the class included *visual aids* (posters); *tactile* objects (fur, taxidermies, skulls); *inquiry prompts* (e.g., a cross section of a tree with the question, how old is this tree?); heavier *texts* (articles, books); and posters/tactile objects specifically related to *wildlife identification* and plant identification. Figure 9 and Figure 10 depict regions of the classroom with an animal taxidermy display and an information board on bears and wolves, respectively. The prevalence of such displays made the classroom look like a museum.

Figure 9

Animal Taxidermy Display in the Corner of the Classroom

Figure 10

Classroom Bulletin Board on Bears and Wolves

I coded the types of resources that occupied the classroom. The codes and their frequency within the eight regions of the school are found in Table 1. The eight regions made it easy to see the kinds of learning materials that occupied the most sections of the classroom. Every region had visual aids. Almost every region had a tactile object such as taxidermies, furs, parts of a tree, antlers etc. The only space missing a tactile learning material was the entranceway (or at least the picture I saw did not have an object in the entranceway). Many of the spaces had tools that could be utilized to help students identify plants and wildlife–such as posters comparing the animal tracks of different types of species. There was a wide range of texts that were available to students and a couple of inquiry prompts were also visible. Altogether, the contents of the classroom indicated that a diversity of science teaching materials were readily available–including many tactile learning materials–the prevalence of which one would not expect to find in a traditional science classroom (e.g., the taxidermies).

Table 1

Types of Learning Resources Found in Each Area of the School

Code	Examples	Count out of eight regions
Visual Aids	Posters and maps	8/8
Tactile	Fur, taxidermies, skulls	7/8
ID	Posters/materials used to help one identify plants/animals.	7/8
Texts	Books, articles	3/8
Inquiry	Questions, or objects placed for side-by-side comparison	2/8

Although the metric is useful for envisioning how different learning materials were allocated in the physical space, its limitation is that it does not indicate how many objects there were or how many books there were, as not all of a bookshelf was in a photo. Although texts were found in 3/8 regions, there were an ample number of books. Contrasting to traditional

schools, which contain a variety of modern technological devices—such as computers, tablets, smart boards, etc.—these were nowhere to be found. Based on what was apparent in this album, it can be inferred that teachers used visual aids and hands-on learning approaches. Furthermore, the learning materials were relevant to the students' location because the content of these materials related to their wilderness surroundings.

Project Bat House: Album that Journals the Making of Bat Habitats

The project bat house album concurred with the finding that place was imperative for the assignments that were allocated to the students. This album had images that showcased a construction and conservation effort that was accomplished through the teamwork of staff and students. The captions on the images detailed the procedure for this project: Prior to students creating bat houses, the teachers and staff created bat-house kits and two completed bat house exemplars. The kits contained pieces for assembly that the teachers and staff had pre-created using power tools to cut, shape, and groove. The teachers and staff also painted the pieces of the bat houses in advance. All of the pieces were painted black so that they would absorb more heat. Once the kits were completed, students were given the opportunity to assemble the pieces together and to create designs on the exterior of the bat house. Next, the youth selected the best places for the bat houses, based on bats' preference for habitat, and installed the houses under the supervision of staff/teachers. Lastly, the teachers, staff, and students, monitored the bat houses for activity.

I did not generate new codes for the images in this album but there were recurring themes. This project exemplified the code *tactile* as students and staff worked together on this hands-on project. Even the design of physical exemplars, as opposed to a 2-D diagram of what the finished product should look like, speaks to the importance of hands-on learning materials. The exemplars were real bat houses that the students could hold, turn, and view while they were working on the assembly of their own bat houses—they were entirely hands-on. The aforementioned theme, *additional teacher's tasks,* was also evident in this project: Teachers at HOPE created an atypical assignment in project bat house that required additional tasks. I consider the bat house undertaking atypical because the type of tasks that the staff and teachers did for this project to be possible (i.e., using power tools to create a kit rather than purchasing kits) were unusual when it comes to designing learning materials for science classes. Perhaps,

this was a result of being in a remote location and not being able to have expedient mail delivery; coupled with having a transient class roster due to the 3-month duration of the program and no predetermined curriculum, as course selection depended on students' choices. Regardless, this project is indicative of the resourcefulness of the teachers/staff, and it further confirms the implementation of *place-based science education*. Figure 11 shows one of the bat houses that the students created and installed in a location that would be easy for them to monitor.

Figure 11

A Bat House that was Created by Students at HOPE

Game Cameras: Catching Wildlife in 4K

Game cameras were another teaching tool that HOPE used to engage learners in *place-based science education*. The assignment and/or projects that were connected to the game cameras entailed catching video footage or images of wildlife in their natural habitat. Students had to select a spot to set their cameras and then readjust their spot depending on whether there

was any activity, a change in season, or if they were more inclined to look somewhere else. The use of game cameras is once again a hands-on task, which offers students the thrill of finding out what they caught on tape and the chance for problem solving and strategizing to find a more appropriate location, if they did not catch a glimpse of any wildlife. This pedagogical strategy is applicable to high school biology classes and elementary units on biodiversity and living things. Figure 12 depicts a still from a game camera recording that the students attained. The label in the album indicated that the animals caught on tape are both cougars and that one of them is a kitten. Although the still was taken at night and the image is blurry due to the animals' movement, it is included here to give the reader a visual on the types of animals that were found and the success of the game camera activity.

Figure 12

Game Camera Footage of a Cougar and Kitten

The following list names the different types of animals that were caught on camera and illustrates the type of science learning opportunities–particularly related to biology–that students at HOPE experienced: beaver, white-tailed deer, coyotes, snowshoe hare, ruffed grouse, spruce grouse, red squirrel, moose, grey wolf, bears, red fox, marten, lynx, magpie, raven, chickadee, cougars, black bear, whiskey jack, robin, and skunk. After catching an animal on camera,

students had to use the clues in the image to identify the creature, and if they were hoping to find something else, they had to reassess their placement of the camera. This required integrating a wide range of information; applying scientific terminology; and learning about animal behaviours and habitat information

The images allowed for several prompts to be made that would increase students' engagement and cause them to think critically. Some of the prompts that were mentioned in the comments were: "What animal is this?" "Is it a male or female?" "Is it the same animal we caught on camera before?" Students had the chance to learn how animals physically grow; how they interact with–and in–their habitat; how they develop more skills; what animals are predators and what animals are prey; and what their mating behaviours involved. There were adorable pictures of baby animals/young animals and their mothers. Comments pointed to the ways that animals adapted for different seasons (e.g., growing a thicker coat, or the change in colour of a coat). This was also connected to changes in seasonal norms. For instance, snow prior to a snowshoe hare's fur changing to white, was indicative that "the snowfall was too early." Thus, the game cameras were used to initiate science discussions and lessons pertaining to the biodiversity of the environment.

Animal Evidence: An Outdoor Whodunit?

Similar to the game camera album, the animal evidence album required background knowledge and research on animals, however, it was open to feedback from Facebook friends in a collaborative effort to determine what animals left the clues that were photographed. This album contained images of evidence that an animal was present, which included: dens, ungulate scrapings, tracks, rubbings, middens, markings in snow, scat, nests, holes, eaten branches, trees stripped of their bark, and fur. The purpose of the animal evidence was to apply knowledge of animal identification, habitats, and animal behaviour to the field. For example, one of the cases was the mystery of why "mushrooms were being left on the branches of conifers." Upon further research the teachers and students at HOPE learned that squirrels leave mushrooms on evergreens to dry. Another comical case was the giant midden with several pinecones on it (see Figure 13). Overall, the animal evidence in this album and the mysteries appeared to be a great hook to engage students in practicing scientific thinking and drawing conclusions based on evidence.

Figure 13

The Giant Midden Found in the Animal Evidence Album

Wildlife at Hope: Pay Attention

The next album, wildlife at HOPE, was similar to the game camera album except the images were taken by one who randomly encountered an animal. These images were taken right on the HOPE camp as opposed to the game cameras which would have been set up further away on the premises. The animals that were photographed were beaver, deer, great grey owl, red squirrel, horses from a nearby ranch, roughed grouse, cattle from a nearby farm, sheep, loons, a moth, a flying squirrel, trout, a northern flicker, snowshoe hares, a coyote, a weasel, and a bat. (The presence of the bat near the bat house indicates that project bat house was indeed successful.) Additionally, the encounters with these animals at the HOPE site meant that the site itself presented many opportunities for learning science and reinforced the notion of wilderness qua classroom. Similarly, it is likely that the youth would have honed their visual and auditory observation skills, which is especially necessary in science fields.

Trips: Eagle Research, Hiking, and Science Centre

Observation skills came in handy on field trips, which were documented in the trips album. The trips that were included in this album were to an eagle research centre, a science centre, and a number of hiking expeditions. During a particular hiking trip, students stumbled upon very faint images in a caved area that was known for having pictographs. They could not decipher the glyphs, so their teacher photographed the cave and used a digital enhancement

program to brighten the faint images. After that, the symbols became clearer, and they identified figures of animals and people. The trip to the science centre would also require observation skills as students learned about natural disasters and weather. There was a broken link to an external webpage with additional information on this field trip. Unfortunately, there were only a couple of pictures pertaining to the science centre in this album. The next trip, which had many pictures, was the eagle excursion. This project was part of a larger initiative organized by an eagle research foundation. Every year the foundation enlists volunteer researchers to count and classify the types of birds crossing a specific migratory path. HOPE's students were tasked to identify birds, the time of the sighting, peak times, and the ages of the birds (adult, sub-adult, juvenile). On the day they conducted this research, they identified golden eagles, bald eagles, and osprey. Collecting and analysing data in the field of ecology, is considered citizen science (Kullenberg & Kasperowski, 2016). Thus, HOPE enabled their students to engage in *citizen science* and provided further opportunities for *place-based science education.*

Phase One: Document Analysis Summary

The document analysis phase of this study progressed my understanding of what occurred at HOPE and introduced me to the type of science education that was utilized. I discovered partial answers to the main research questions and relevant contexts. For instance, it was clear that the students came from diverse backgrounds and faced a variety of strains. Although I was able to identify a number of pedagogical approaches that were used with this population, such as *citizen science*, *place-based science education, hands-on learning*, and *wildlife inquiries*, it was unclear if and/or how educational practices addressed those strains. Therefore, more data were needed to understand the challenges, successes, and opportunities associated with those strategies.

In total 18 codes were created, and the code *strain* was subcoded to identify six particular strains that the students' experienced. The subcodes for strains and the total codes that were found in this phase of the study are included in this chapter for the reader's convenience in Table 2 and Table 3, respectively. The main type of strains that the documents noted was *addictions* and the primary way that they referred to mitigating these strains was through the use of *therapeutic programming* which took the form of *wilderness adventure therapy*. Other strains included *living on the streets*, *education*, *broken relationships*, *mental health issues*, and *other*

issues. Although the documents mention educational strains and pedagogical approaches, there was not any clear indication that these educational strategies were intentionally used to help alleviate strains. However, the pedagogical approaches that were used for science and themes that were found in this phase—*hands-on learning, place-based science education, citizen science, wildlife inquiries, Indigenous inspired practices, fun,* and *uncommon teacher tasks*—were advanced in the the next part of the study to gain a nuanced understanding of the relationship between strains, science pedagogy, and engagement.

Table 2

Specific Strains that Were Found in the Document Analysis

Code	Meaning	Examples	Total
Strain	Types of strains that students experienced	"addictions" "other challenges"	11
Addictions	Relating to the HOPE clients struggle with additions	"drug addictions"	4
Living on the Streets	Related to the HOPE clients not having a place to live	"on the streets"	1
Education	Educational strains	"struggled with school"	1
Broken relationships	Strains due to not being connected to family/not having friends	"saw her relationship with family deteriorate"	1
Mental health issues	Strains related to mental health	"mental health issues"	2
Other	Vague descriptions of strains	"other challenges"	2

Table 3

Total Codes From the Document Analysis

Code	Meaning	Examples	Count
Strain	Strains students experienced	"addictions" "mental health"	11
(SP) Student perspective	HOPE's students share their views on the program	"I accomplished something and did it well"	11
Visual Aids	2-D visual learning material	Posters and maps	8/8
Wilderness	Wilderness-based programming	"[HOPE] uses the wilderness…"	7
Transformation	Student growth/positive change	"[learning] to trust"	7
SP Achieve	Students says accomplishment	"I learned"	7
Tactile	Any hands-on 3-D teaching tool	Fur, taxidermies, skulls	7/8
Wildlife ID	Items for wildlife classifying	Tracks, claws, fur, markings	7/8
Empowerment	HOPE's role to build up youth through their programming	"empowerment" "build… confidence"	7
Therapeutic	Various forms of therapy	"wilderness adventure therapy"	6
Personalized education	Approaches to ed that met the individual needs of each student	"intentionally designed for an individual"	4
FNIM inspired practices	Rituals that were taken from Indigenous culture/Elders	Smudging, talking circle, teepee	3
Experiential learning	Learning through experience	"experiential learning" "wilderness… as… classroom"	3
SP Awe	Students describe being amazed	"breathtaking"	3
Texts	Textual Learning Materials	Books, articles	3/8
Inquiry	Items for inquiry-based learning	Questions or comparisons	2/8
Relationship	Positive student-teacher relationships	"when he's not teaching, he's a friend to the kids"	1
SP personalized education	Approaches that met the individual needs of each student.	"Individual-based academics"	1

What the documents do elucidate is that there were a number of partnerships that enabled HOPE to operate, which included a partnership with the provincial health care services, the schoolboard, the umbrella organization, and perhaps an Indigenous community. On a day-to-day level these partnerships were evident in the cooperation between teachers and staff, who worked together to help the youth on their healing journey. A derivative of these partnerships is that HOPE had an all-inclusive approach to wellness that used rehabilitative treatments (such as group therapy, adventure therapy, and *Indigenous inspired practices*) in tandem with schooling to *empower* the youth. The unique and remote location of HOPE was integral to both therapy and schooling as the *wilderness* was the classroom where *experiential learning* thrived. Although students could only stay at HOPE for a duration of three months, their testimonies suggest that their time at HOPE enabled them to *achieve* successes that they had never envisioned prior to joining the program. Even one who was initially sceptical expressed being "glad [she] stayed" and another openly admitted that he never thought he could be sober for more than one day. Overall, the documents indicate that HOPE was an invaluable part of the healing journey for youth who had experienced a variety of strains.

To uncover more of the details on what HOPE entailed the following themes from the document analysis phase were considered in phase two:

- Loss of funding
- Indigenous inspired practices
- Classroom setup

These themes helped to understand more of the specifics pertaining to HOPE. Although the first phase of the study touched on some aspects of the research questions, others were left unanswered, such as, whether the pedagogical strategies that were used for science education helped to alleviate strains. The interview phase of the study was central to gaining a rich understanding of students' engagement with the pedagogical strategies that were used in science and how said approaches were connected to strains. Thus, this preliminary phase of research was foundational to understanding the background on HOPE and to formulating codes, themes, and questions, which were advanced in the next phase.

Phase Two: Interviews

This section contains the results of six semi-structured interviews with those who had an occupation at the HOPE site. Not all of the interviewees were employed by HOPE's umbrella organization as some were employed by the schoolboard. The interviewees included two of HOPE's teachers, the principal, the site supervisor, a youth worker, and the director of the umbrella organization (who had worked at HOPE in various capacities prior to becoming the director). To support the reader's understanding of the interview findings, contextual data that were a result of this phase were amalgamated and included in an overview of HOPE at the start of this section.

The results from individual interviews are presented separately, prior to comparing the overall results from this phase. Each interview section begins with a brief description of the interviewee and is followed by a word cloud of the 75 most frequently occurring words from the interview, which give a sense of what occupied the conversation. As with any word cloud, the larger words were uttered the most and the smaller words were least spoken. Next, the resultant codes and themes are discussed, with a particular emphasis on *strains*, *mitigating strains*, and *pedagogy*. Thereby, I position the reader for the final phase of this study and a discussion of the findings in ensuing chapters.

Additional Context on Hope from the Interviews: Painting the Picture

Prior to sharing the results from each interview, I present the cumulative interview data that pertain to the context of HOPE. In doing so, I paint a broad strokes picture of HOPE's programming, staff roles, facilities, wilderness adventure therapy, and schooling. The results from the interviews provide detailed descriptions of students and teaching at HOPE, which address the research questions in depth. Thus, presenting the contextual findings first benefits the reader.

Although the Healing Outdoor Program and Education offered a safe space, students could only stay at HOPE for a maximum of three months and after that they had to return to their communities. Students were "free to leave the program" at any point in time. If they were mandated to attend HOPE and they decided to leave, they were relocated to another treatment program. However, students chose HOPE with an understanding of what it entailed. Each student was given a tour of the HOPE camp on intake and informed of what to expect in terms of day-to-

day activities. The schedule included breakfast, chores, school, snack time, more school, lunch, wilderness adventure therapy, dinner, free time, and more group therapy. Weekend trips (hikes, rock climbing etc.) were also a regular part of the routine. In addition, the youth were "supervised at all times."

Those who worked at the HOPE site included the teacher(s), three youth workers, and a shift supervisor. All of the teachers and staff were expected to take care of the facilities by "ploughing the roads," cleaning, etc. They also took turns preparing meals, which they all ate together. While the adolescents were in school, the youth workers did not have to supervise them. Instead, they would tend to other matters such as making appointments and filling out notes on the clients. While the students were in group therapy, the teacher(s) had time to prepare lessons and grade assignments. Aside from that, the staff and youth were frequently together, which created a different dynamic compared to typical student-teacher and youth worker-client relationships. It also created a unique relationship amongst colleagues because they not only interacted on a daily basis, but also lived together.

The living accommodations included standard features for a camp setting. There was a "girls' cabin and a boys' cabin," which were filled with bunkbeds. The youth workers and youth stayed in the same cabin, but the "teachers had separate cabins." Another cabin housed a dining hall with a small industrial kitchen. In addition, there was a laundry room as well as separate bathhouses for males and females. The bathhouses had stalls of showers and a row of sinks–similar to a locker room in a gym–but no toilets. As an alternative, there were outhouses located around the camp. The site had dirt roads and there was only one unpaved windy road–that bordered a cliff at some points–which led to the camp. The site was close to a lake, and in the distance, one could see mountains. Other features located at HOPE included a teepee and sweat lodge. There was also a dirt basketball court, small wooden mazes, balancing apparatuses, and a towering ropes course. Overall, the remote location was ideal for science education and wilderness adventure therapy.

The type of wilderness adventure therapy that was utilized at HOPE (ropes course, climbing, hiking, etc.) was similar to other Canadian programs and the clientele–youth involved in the justice system, who were struggling with addictions–was also akin to the clientele of other wilderness adventure therapy programs. Just as other outdoor adventure interventions used/appropriated Indigenous culture, HOPE used "traditional practices and teachings" to help

their clients. In particular, the circle of courage philosophy, which recognizes everyone's need for belonging, mastery, independence, and generosity (Brendtro et al., 2005) was a staple at HOPE. Smudging and solos were also a key part of the reflection and meditative practices. HOPE used these practices "because of the land the site was on" and because of the high representation of "Indigenous youth in the program." In terms of adventure therapy, the activities that the youth participated in depended on the season and could include snowshoeing, skiing, hiking, rock climbing, canoeing, and of course, the ropes course. Experiential learning was a core facet of the wilderness therapy that involved using experiences and challenges as a "metaphor for the struggles and rewards" that the adolescents faced in life. Through these programs, HOPE aimed to help the youth cope with strains from addiction, deal with anger, and mitigate other stressors.

Schooling at HOPE was another outlet for the HOPE youth to face challenges. HOPE's students were racialized as either "White or Indigenous." They all had "negative experiences with school" in the past. The average student profile could be summarized as disengaged in school (i.e., not attending classes prior to HOPE), lacking high school credits, and/or having dropped out of school completely. For that reason, being legally required to attend school meant that the youth had another chance–or perhaps, schooling had another chance. For the three months while they were at HOPE, they could not miss class. Whether or not the approaches at HOPE presented educational strains or helped to alleviate them will be further explored in relation to science. However, according to Teacher A, science was "a popular course at HOPE–if not the most popular."

Teacher A: "Building Bridges"

Teacher A had taught at HOPE for eight years. During that time, he was in charge of the humanities courses, outdoor education, and physical education, while Teacher B taught the math and science courses. They taught simultaneously, shared the classroom space, and did a lot of team-teaching. Teacher A created the Facebook page that was full of content on science education at HOPE. He is currently teaching outdoor education at another school in that province. Thus, Teacher A was able to speak about the science engagement he witnessed and share some of the techniques from the HOPE school that he currently uses.

The top five words in the word frequency query for Teacher A were *kids*, *school*, *time*, *know*, and *camp*. These words also included stemmed words, which are words that have the same root and different endings such as teacher, teach, teaches. Therefore, the word, "camp" was not only about a camp site, but also entailed the act of camping. The words *kids*, *school*, *time*, and *know* occurred the most, however, the word *camp* was unexpected. Its place in the top five frequently occurring words suggested that the unique wilderness location, (essentially a camp setting) was part of education at HOPE. The word cloud from Teacher A's interview is found in Figure 14 to provide insight on what occupied the discussion.

Figure 14

The Most Frequently Occurring Words from Teacher A's Interview

The codes that were created from the interview with Teacher A provided an in-depth look at education at HOPE. These codes can be found in Table 13 in Appendix 1. *Science pedagogy* was the predominant code, which I sub-coded for specific pedagogical approaches. The codes for science pedagogy can be found in Table 14 in Appendix 1. Based on the codes, education at

HOPE had a number of benefits and challenges. It was used to help students who experienced strains with schooling (e.g., "not having success in school," dropped out of school and/or truancy) get back on track academically. *Science pedagogy* was particularly useful in this endeavour: The Science 100 course was a frequently earned credit because, "it didn't require a lot of reading and writing like English and social studies do. So, they could complete science while they were with us and earn… credits in that course." Earning credits was viewed a vital step for reengaging in schooling.

Reintegration in students' home communities and schools was also particularly important to education at HOPE. For that reason, teachers constructed students' transition plans to help them reengage in their home school and communities when they left HOPE. The transition plan was not limited to academic support but also included helping students to access green spaces. According to Teacher A, "being outside everyday even just for a portion of the day had those effects on kids, positive effects" that helped them to cope with stressors in their lives as, "there were kids that said being outside was their new happy place." The wilderness programming used at HOPE was described as having therapeutic benefits that fostered *transformation* within students, including increased confidence from accomplishing wilderness related tasks (e.g., completing a long nature hike).

However, there were several challenges that were due to its remote location, which included "no cell service so, even if you had data on your phone it wouldn't work," and not having a reliable internet source. Teacher A mentioned another challenge was a lack of "motivation." Although the teachers were willing and readily available to help students outside of class time (because they lived at HOPE) not every student took advantage of this unique access to teacher support. Teacher A describes the situation as follows,

> *[A] challenge for us was the motivation piece for certain students… the[y] hadn't been going to school and really didn't see the benefit of continuing and their rationale at that time was, 'you know what I'm just going to get a job… I'm going to make way more money doing that than if I continue on in school.' So, trying to convince them that… it's probably a good idea to get your grade 12 …cause you have a better chance of getting hired–even if that's your plan to go and work… I'm not knocking that at all. So, trying to convince them [of] the importance of getting your grade 12, and we [teachers] can play a role in getting you back on track.*

In this quote, students were predominantly unmotivated to learn and earn credits when they felt that they could easily attain a job. Therefore, the teachers tried to convince the youth that having an education could only improve their occupational prospects, but not all of the kids bought-in to the value of education. Those who took advantage of the "low-student teacher ratios," reaped the benefits of such help and showed academic improvements. Aside from the unique teacher-student relationship and access to teacher support, which was present at HOPE, Teacher A recounted a number of other pedagogical approaches.

Teacher A expressed several pedagogical techniques that were beneficial to teaching the HOPE clientele and that worked well with the type of science content that was taught. *Inquiry-based science* was a pedagogical strategy that teachers frequently utilized. Students had a natural curiosity about their wilderness surroundings. He says,

> *The questions came in all the time. They were always asking things wildlife was the big one for them and like I said, fear a little bit lots of curiosity and it grew... Wildlife was a huge part of the kids showing up there. They were city kids–most of them had never seen wildlife before.*

Instead of answering these questions, Teacher A would "let them discover those things on their own" and help them to draw reasonable conclusions.

This form of education was intricately linked to *spontaneous education* and *place-based science education*. As students trained their observation skills, they began to notice more of their surroundings, which fueled their curiosity. Referring to what they observed, Teacher A listed that "kids would find things, a kid would find antlers, a kid would find scat, kids would find hair on barbed-wire fences…" The pursuit of answers helped students to think through what they observed and connect it to what they had previously learned. This made the game camera assignment a hit, which he enthusiastically explained as follows:

> *We also purchased a series of trail cameras that we could put up… They're motion activated. We captured everything from bears, cougars, wolves, elk, dear, lynx, fox, like everything. We built [it] into one of our [science] courses… So, they could learn about wildlife in the area, the ecosystems. They could go out with a camera, place it wherever they wanted... They'd leave it for a week, come back, kids would go through the memory card, see what they captured, identify the species and then if there was a target species they were looking for: did this spot work? What worked? What didn't work? If there was*

> *nothing on the camera, they could move it and try something else. It was a really really fun way to teach wildlife and satisfy that curiosity.*

From a teaching perspective, anticipating the animals that the students would capture was beyond the control of the educator. However, this supported unscripted teaching and learning moments. Similarly, this assignment was prefaced on multiple attempts at photographing animals, therefore, if one did not attain any footage, it was not viewed as failure, but as learning that a certain spot was not right for the target animal. Having another try to learn from their past experiences, and the exciting nature of the assignment, made it a safe way to reengage the youth.

Using *tactile* learning materials was also essential to the science education at HOPE as this strategy was "more powerful [i.e.,] to be able to touch things and hold things… than to see photos or look at videos." For that reason, referring to the 1-room schoolhouse, the teachers "filled it up with taxidermy and antlers and we got some money to buy eco artifacts–so resin and rubber and footprints. So, all these things that kids could touch and feel and kind of learn from..." It was evident that Teacher A promoted hands-on learning. It was a method that worked for the students at HOPE and one that he continues to use in his current teaching.

Teacher freedom, team-teaching, and *personalized education* were also important to Teacher A, however due to the high number of students in his current class (30) these methods are less feasible than they were at HOPE. This exemplifies the "unique experience" that HOPE fostered. In terms of *teacher freedom*, Teacher A expressed having greater freedom to plan trips at HOPE and to be spontaneous. Describing the planning process to go on trips he said

> *They [umbrella organization] put their trust in us to be able to make those decisions. Whereas, if I was in a regular school, tripping decisions, taking kids outside, all of that stuff I have to communicate with the admin team and let them know where I'm going… I'm responsible for those kids. But out there [i.e., HOPE], it was just accepted that you were taking kids outside, you were taking kids on the water, and you were making the right decisions. So, I miss that freedom piece a lot… and I think the kids really benefitted from that.*

He could plan more trips at a variety of locations (wilderness hikes, field studies, canoe trips, etc.) because trips were run under the umbrella organization and not under the schoolboard. Similarly, HOPE was situated in a remote location that was ideal for trips, which saved on the cost of transportation fees (such as bussing students to a site). The schoolboard has more

regulations for trips and did not have a budget for them. In fact, at Teacher A's current school, there is no funding for trips–students have to cover the entire cost. Therefore, the HOPE school was unique in the freedom to go on trips and the conduciveness of the setting for wilderness excursions.

Team teaching is also not possible at Teacher A's current school because if two teachers were to combine their classes, they would have "70, 75 kids with two teachers" which means that capacity restrictions of a typical class (i.e., approximately 30 students) would prevent this strategy unless the gym/outside was available. This is unfortunate because, Teacher A was very fond of team-teaching at HOPE. He praised it for the opportunities to "mentor." Referring to another HOPE teacher, he stated, "he was a mentor to me when I was out there, and we team-taught a lot of things the two of us and that just continued and grew." Teacher A was in support of learning from/with other educators. In addition, *personalizing education* at HOPE was easier to accomplish than at his current school due to the "low student-teacher ratio that is preferred." *Personalized education* entailed making sure the content and pace of learning were relevant and suitable to the student. This technique helped to mitigate stressors that are linked to not being able to keep up with the rest of students in a class. The fact that teachers were living in community with students, helped them to know their students, which supported personalizing their learning experiences.

Teacher A is a firm believer that positive teacher-student *relationships* are integral to learning. He spoke about his non-judgemental approach of relating to students at HOPE. When students disclosed that they had relapsed on a break at home, Teacher A did not condemn them. He tried to help them explore the situation to determine what they could do in the future to mitigate it. He said that "kids could be brutally honest, and they knew that being honest with us was their best way forward and we're not going to judge you—that's not our role." The fact that students were willing to confide in Teacher A, shows that they had a level of trust in him, indicative of a good relationship. Teacher A strives to build positive relationships in his current teaching, regardless of the large class sizes. Yet, the discrepancies between teaching at HOPE compared to Teacher A's current school, point to the uniqueness of HOPE and the importance of *reintegration*. Upon leaving HOPE, students no longer had classes with low student-teacher ratios. Therefore, ensuring that students got additional supports and built positive connections with staff and teachers upon re-entry was vital to mitigating strains that they experienced in

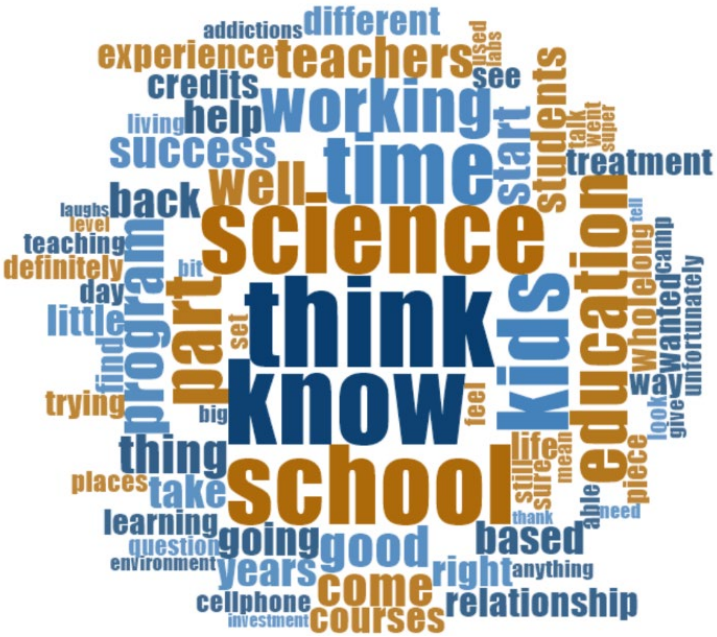
traditional schooling. For that reason, HOPE staff and teachers worked to build the bridges that their students needed once they left HOPE.

Teacher B: "Investing in the Human and not just the Transcript."

Teacher B was at HOPE for a decade. He started out as a youth and family support worker for just under two years prior to putting his education degree to use as a teacher at HOPE. His teaching background is in experiential learning and wilderness therapy. However, he was qualified to teach many courses. Teacher B was in charge of the math and science courses at HOPE. He also did coteaching with Teacher A. As the science teacher, Teacher B had a wealth of information to add regarding the science engagement he witnessed at HOPE, dealing with students' strains, and the techniques that he continues to use in his current teaching, which has a similar student demographic to those who attended HOPE. The word cloud from Teacher B's interview, is found in Figure 15, illustrating topics that were covered in our interview.

Figure 15

The Most Frequently Occurring Words from Teacher B's Interview



The top five words in the word frequency query for Teacher B were *think*, *know*, *science*, *school,* and *kids*. Once again, these words included stemmed words. None of the most frequently used words stood out as surprising because they are all related to education. The words *think, know,* and *kids* were also found in the top five occurring words in Teacher A's interview. (The codes from this interview are found in Table 15 in Appendix 1.) The most numerous codes from the interview with Teacher B were *science pedagogy*, *mitigating strain*, *additional teacher tasks* and *science content*. Similar to the analysis of Teacher A's interview, the code *science pedagogy* was sub-coded to determine the types of pedagogical strategies that were used. (The codes for science pedagogy can be found in Table 16 in Appendix 1.) Teacher B described several ways in which science was taught at HOPE that mitigated strains in students' lives. Particularly, the clean slate that students received at science class and the ability to learn content in a way that worked best for them (i.e., less reading), with the one-on-one support from a teacher, enabled students to get science credits.

However, teaching took a different form as there were *additional teacher tasks* that coincided with duties related to living in the wilderness and living in a community with kids. Teacher B said:

> *If we're in the middle of a blizzard the teachers were out there helping to fix the snowplough and clear[ing] the road. If the generators shut down, the teachers were part of that. If we were short-staffed, the teachers were helping to cook a meal or supervising.*

He summarized the teacher's role as filling any need that occurred at the site. He also mentioned that tasks outside of instructional and preparational time included working on students' reintegration plans so that they could be accepted back into their community schools, get jobs, and get volunteering positions.

Reintegrating in school was an integral component of students' success after HOPE and a key factor in mitigating future strains. Often, HOPE staff would receive phone calls or emails from students who were doing well post-HOPE and reintegrating in school was usually a part of their success. Teacher B portrayed the role of school as not only helping students to go on to vocational success, but as social control theorists and social learning theorists would suggest, keeping them productively occupied. Speaking of students, he says "if you're not… in school… then you're a part of this other league of kids that has a lot of time to burn and a lot of time to get into trouble." For that reason, Teacher B said with conviction, "I'm fighting tirelessly to get them

another placement or get them another chance at a school or get them into a program or get them credits, that they deserve." His efforts to help the HOPE youth transition emphasized the importance of *reintegration*. He continued:

> *Every one of those actions was like an investment in that little relationship bank account and when they [the students] feel support and when they feel connected and when they feel cared for, you create an environment where someone can actually learn.*

Therefore, Teacher B attributed his genuine care and actions as fostering a relationship that was a prerequisite for learning to occur.

Teacher B affirmed that helping the kids get jobs would be another way to mitigate strains from poverty and prevent them from engaging in criminal activity. His approach to job placement was to honestly evaluate the skills that students had (even if those skills were learned from criminal behaviours) and find a legal occupation where those skills could be an asset. Speaking about this approach and recounting a conversation with a student he explained that it involved:

> *Being open and being creatively minded to say things [such as] 'well you know you're a drug dealer, so that means you have some skills. So, how do we maximize–how do we take advantage of the skills that you already have?' …As opposed to scolding them or telling them they're a failure or shaming them. 'No, you can still be who you are and do what you are good at, let's just find a way you can do it that won't lead to jail.'*

The previous quote illustrates that Teacher B took a strengths-based approach to engaging with his students.

He went on to speak of a student who was a high-end drug dealer and who tried to evade doing school related tasks at HOPE. He confronted this student about his potential and the opportunity that was slipping through his hands. The student began working diligently and earned close to a year's worth of credits at HOPE. Teacher B set him up with a part-time job at a cellphone kiosk and did not hear from him after HOPE (because teachers and staff were not allowed to contact students) until he "got an email and it was from a corporate account with a major cellphone provider." He said, "it was an email from this young man, and he had not only done sales, but he had worked himself up into a management position and he was one of the youngest regional managers in company history." The ability to reintegrate that well had to do with the student's decision to change and apply himself to his education.

Transformation was another code that was recurring in this interview, and it is quite similar to the code empower. The difference between the two is that empower is used when an interviewee or a document specifically says we/HOPE helped this person to do something positive, whereas transformation refers to when positive changes in students are attributed solely to the student. Teacher B said education was central to students' positive change, he spoke about empowering students, and he highlighted their transformations. He recognized that this particular student demographic (students with addictions/criminal pasts/and numerous stressors) were not always supported by educational systems and that by building relationships with students his role as the science teacher "helped to heal a lot of the wounds left by traditional education. It helped to reignite some excitement or passion towards it [i.e., learning] and it helped to really set a proper invitation for a safe place to learn." With a convinced tone and speaking about the students' rehabilitation, he said, "I felt like we could affect the most change from education in the shortest period of time."

Teacher B provided rich descriptions on the strategic processes that were used to affect change via education at HOPE and the importance of science courses. Since students arrived at HOPE at different points in their schooling, the content that they were taught depended on a number of factors including: What they wanted to learn? What credits could they attain easily? What subjects were they already close to completing? What could they use the most help with and therefore make the most of having a low student-teacher ratio? Given these factors, I was surprised when Teacher B echoed Teacher A by stating that "Science was quite popular for multiple reasons," especially given this student demographic and the difficulty that learning science presents.

Teacher B went on to describe a particular science course that was offered: "Science [100] was probably one of our most popular courses… it definitely involved a lot less reading and it was a fairly short course that with some concerted effort you could get through pretty quickly." Both teachers described Science 100 as being split into units on biology, chemistry, physics, and environmental sciences. It was adapted to the wilderness location such that the biology and environmental units were tied to wilderness identification, plant identification, ecosystems, endangered animals, outdoor education, wilderness trips, and conservation efforts, all while meeting the curricular expectations. The teachers tried to make the course "a lot more practically based." Referring to written assessment and evaluation Teacher B said:

> *For each [unit] they got paper booklets… There was a lot of multiple choice, a lot of fill in the blank, a lot of matching–which was good, we had some videos… [It] wasn't super long and it wasn't super heavy in terms of reading goes. There was a final exam that covered everything in the whole course.*

Along with the written assessments there were also field studies and labs, which provided a variety of different assessment forms. Doing well in this course was integral because Science 100 was a foundational credit that enabled students to go on to take the other science courses they needed to graduate. Thus, it was important to attain.

There were challenges to teaching this course and teaching at HOPE in general. A big hurdle to teaching science was that they did not have a science lab for the chemistry unit due to safety regulations at HOPE (similar to secure care settings) and that "[they] didn't have the facility for doing actual labs." Teacher B said one way they got around this was by doing "field studies, where we would go to sites," and referring to chemistry labs he said with a disappointed tone, "we only had on paper labs… so it was more like a mock lab… We would walk through the scientific method with some data and the data would be provided." Another challenge mentioned was the lack of internet and being disconnected from the school system. In addition to that, the three-way partnership between the HOPE umbrella organization, the school board, and the provincial health care system required a lot of logistical coordination that traditional schools do not have (e.g., balancing time for treatment and education). In spite of these challenges, the Science 100 course had a high completion rate. The codes for science pedagogy and content can be found in Table 16 in Appendix 1.

Teacher B described the way that the course was adapted to meet the needs of learners. He reiterated the importance of using *tactile* learning methods and he also expressed the importance of making learning *culturally relevant* and *experiential*. *Place-based science* and *field studies* were done to help students learn as much as they could from their unique wilderness setting and it enabled students to be scientists–as opposed to simply reading about scientists in a textbook. He stated that there were many "who liked the field study and getting out on the land, being able to try to connect with some of the things that they were studying." Indeed, reading was not a dominant component of the Science 100 course, which is part of the reason it was a popular choice. Many of the students at HOPE did not have a strong academic background and their literacy levels varied. Thus, being able to learn in ways that were meaningful to them and

being able to relay what they learned in ways that went beyond reading and writing, was important at HOPE.

Based on the content analysis, it is evident that building strong *relationships* with students was quintessential to Teacher B's approach to teaching. He spoke candidly about the need to connect with students, letting them know that they mattered, and living in community with them. He believed it was vital to not judge or shame students for their pasts. He ensured that students knew the teachers would work diligently to help them. Summarizing teaching at HOPE, he shared, "it was just an incredible experience of education through relationship." To him, teaching by building strong relationships was all about "investing in the human and not just the transcript."

Principal: "Stepping-stone for Science Opportunities"

The HOPE school was connected to another school that was located in a nearby metropolitan region. The latter school, which was for young offenders, had partnered with the umbrella organization of HOPE for 15 years to provide schooling. The principal for both schools had been working at the partner school for eight years. The interview with the principal provided insight on the logistical aspects of running a wilderness school, particularly in regard to tracking students' learning and resource allocation. The interview with the principal was half an hour (as opposed to an hour), which is why there were less codes (see Table 17 and Table 18 in Appendix 1). Nonetheless, this interview provided an additional vantage point on science education and HOPE.

The top five words in the word frequency query for the principal were *school*, *camp*, *kids*, *teacher,* and *science*. Once again, the word camp is found, pointing to the significance of the wilderness setting of the school. The word cloud from the principal's interview indicates what was discussed and is found in Figure 16 below.

Figure 16

The Most Frequently Occurring Words from The Principal's Interview

Some of the codes reinforced apparent trends. For instance, the most prevalent code was *science pedagogy*, which was sub-coded to reveal specific approaches that had been mentioned. The code *wilderness* restated that the wilderness programming was a key component of HOPE and the code *mitigate strain* reiterated that an integral part of the school was helping students get academic credits more efficiently. The codes for *challenges* presented a new perspective, because thus far funding had not been explicitly mentioned as a challenge. In particular, the principal said that the funding for resources (books, learning materials, ink, software, etc.…) was the same for classes at HOPE and classes in the young offenders' school. The funding disparity, which made HOPE an expensive program, was due to the low student-teacher ratio: The cost to run the HOPE school was more expensive per student because usually classes would have a student-teacher ratio of 30:1. At HOPE the max student-teacher ratio was 8:1. He explained, "we were funded through [the provincial] education[al system] to provide two full time teachers, potentially that was about $200 000 for the 2 teachers… So that's a fairly expensive program." The principal mentioned that due to funding cuts the HOPE school could no longer operate, but

he did not elaborate on why this program received the cut as opposed to the other programs offered by the umbrella organization.

The codes for the type of pedagogy that the principal spoke of provided new insight on assessment and personalized education at HOPE. Speaking about students being mandated to attend HOPE, the principal remarked, "if they were placed there, they would have completed any justice interests." Meaning that the students finished awaiting trial and their sentencing (secure care or custody), prior to attending HOPE. Before entering the justice system, students may have been in school, or they may have dropped out of school. If they were in school prior to their involvement in the justice system, they would have bounced between at least two schools before attending HOPE–the school in their home community and the young offenders' school. This presented challenges because he said their students,

> *have ongoing registration. So, there might be a kid who comes to you [young offenders' institution] in the middle of November and leaves 60 days later. So, they're out of sync with most calendars and most schedules of schools and so both the [young offender institution] and [HOPE] had to develop their own system to track kids.*

One of the ways that this challenge was overcome was that "the teacher would contact the sending school to see what work they had done and what outcomes they had passed…instead of starting the young person all over again." Since moving from school to school can place strains on students and can be "very discouraging," especially when they had to relearn content, the HOPE teachers "would teach them what they hadn't learned yet and they would track that in our… program… [and] send that to the receiving teacher when they go back to their community school."

Therefore, it was vital for teachers at HOPE to assess the content of what students had learned up until that point. A system for communicating between schools and an academic tracking software were developed by the young offenders' school and the HOPE school so that teachers at HOPE would know the specific curricular objectives that had already been met by the student. Referring to HOPE and this system, he expounded:

> *They used the same software we [young offenders' school] use. A software specific to [the young offender school] … It's a tracking system… it tracks their progress, it tracks their attendance, it tracks what courses they are in. It's outside of the provincial one.*

> *Many of the software packages that schools use are based upon a June 30 end date and within that it is structured on semesters and all of those things.*

This tracking system catered to students who had ongoing registration and it was more detailed than a report card because it accounted for what was completed and any courses that were in progress, whereas a secondary school report card only specifies courses that are completed. This is notable because usually when a student goes to a new school, they learn whatever the class is already learning–even if they previously covered that topic. By tracking students curricular learning outcomes, teachers at HOPE were able to help students get credits faster and mitigate strains associated with starting from scratch, because they bypassed reteaching the same curricular content.

Specific to science teaching, The principal viewed the location of the HOPE school and the classroom itself as conducive to learning science. In answering the question from the document analysis phase about why the classroom looked like a science museum, he spoke at length about the physical setup in the school. He viewed it as a way of captivating students' attention and helping them to learn. With an enthusiastic tone, he said:

> *If you were to look at the classroom itself, I think there were umm a unique character to the classroom… The class itself had I want to say 20 taxidermy animals within it: local coyote, skunk, deer, they also had latex footprints of animals. So that you can look and see the local animals that were in the area… bear country, so to see a bear that is literally outside the door on the wall and know that those animals are walking around… so the kids would look at those and see the footprints and… [have] opportunities to go out and see what was going on in the wilderness area that they were in.*

He shared that the location of the HOPE school made it easy for teachers to take their students outside and show them examples of what they were learning (e.g., content related to the unit on living systems and on the environment). In addition, students had science content reinforced by spontaneously learning about their surrounding regions on trips. The principal emphatically described the environment by stating, "there's wildlife there that you would not believe. I mean there're pictures of cougars with cubs, bears walking up to the camera, literally this is right at camp!" He went on to address the connections to science outcomes, "I mean there're many opportunities. They do a lot of outdoor trips, so they would speak to erosion, water tables, many

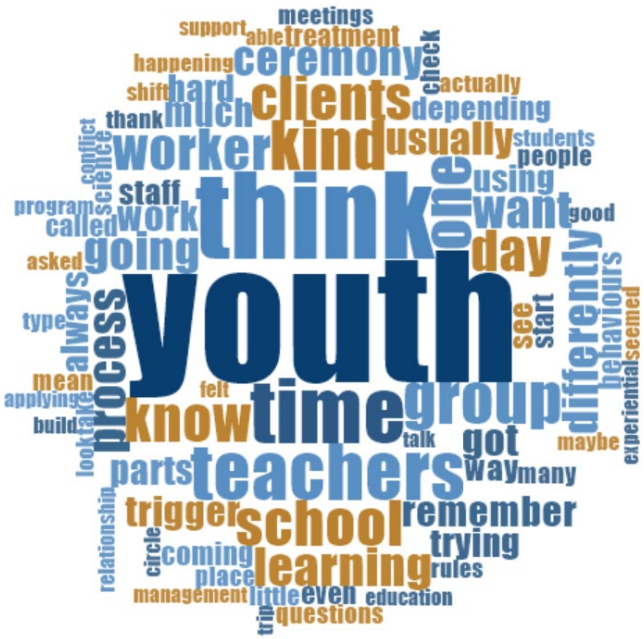
of those things that were science related." Overall, the principal viewed the unique wilderness location and classroom setup as a "stepping-stone for science opportunities."

Youth Worker: "Just Being in School Could be a Triggering Thing"

The youth worker had worked at HOPE from 2017–2019. The youth workers day-to-day tasks shadowed the kids, as they accompanied them almost all of the time to supervise them, to provide treatment, and to eat meals with them. The only time that youth workers were not with the adolescents was when the youth were in school. Despite this, the youth worker was able to speak about the science learning that occurred on trips and the conflict mediation that she was involved with between teachers and students. Thus, the youth worker provided another vantage point on science education at HOPE and teacher/student relationships. To get a sense of what occupied our discussion, the word cloud from the interview with the youth worker is found in Figure 17.

Figure 17

The Most Frequently Occurring Words from The Youth Worker's Interview



The five most frequently occurring words from our conversation were *youth, think, time, teachers, and group.* The word group refers to the group treatment sessions. Time was another frequently used word by the youth worker because the schedules were regimented and there was a lot that youth workers had to accomplish in a short amount of time. For instance, she spoke about "time management," "a busy time," and having "some free time." The youth worker used time as a colloquial expression when speaking about some of the issues the youth had at HOPE by saying they "had a really hard time."

Several codes from the interview with the youth worker were found and explained in the previous sections, therefore in this section, I will focus on the codes that are new as well as the code *challenges*. (The codes from the interview with the youth worker can be found in Table 19 in Appendix 1. In addition, the code *pedagogy* was subcoded and those resultant codes are also found in Appendix 1 in Table 20.) The code *pedagogy*–the most prevalent code from this interview–was used instead of *science pedagogy* because during the interview the youth worker spoke in general terms about education and occasionally made explicit references to science pedagogy at HOPE. Even though the code *strain* has already been discussed it is included here because the youth worker identified new strains that were present in the students' lives. Similarly, the new codes were *student triggered*, *communication*, and *Indigenous inspired practices*.

The youth worker mentioned that school could be a stressor for many students. *Student triggered* was a specific type of strain in which something *at HOPE* was a stressor to the youth. She said, "just being in school could be a triggering thing" because many of the students did not have positive interactions with schools/teachers in their past. She described it as something to be expected:

> *because of the nature of what the youth were going through, a lot of them had a hard time in school–not all of them–and sometimes it was a really triggering atmosphere for them and sometimes there would be issues.*

In this quote, "the nature of what the youth were going through" encompasses the additional strains that they experienced. The youth worker identified gang involvement, suicidal ideations, cognitive impairment (from drug use), learning disabilities, and internal conflicts as other strains that they experienced. In this quote–and similar to all of the interviewees–the youth worker is careful to not homogenize all of the students who attended HOPE. Notably, she makes a point of

saying that not all of the adolescents had a tough time in school. Yet, for many, school was a place where they were on edge.

She continued to describe some of the specific aspects of the program that triggered the youth:

> *We had all of these rules, things like not being able to use swear words or glorifying– yes–this was another thing that would trigger behaviours–glorifying drugs, when they'd start talking about their drug use and really glorifying it… Some of [the rules] were just so hard for the youth to metabolise. They felt so oppressed by the rules or they felt so frustrated that they had to abide by these rules. If we were in a group and a youth started glorifying, or a youth started swearing, or a youth started using language that was attacking to another client, and a worker addressed it, that could trigger a behaviour.*

Given that the youth were disengaged from school and that living on the streets was a strain that some of them experienced, adapting to new rules would certainly have been an adjustment for them. Students were also provoked by the "tone of voice" that one (teacher, staff, or other student) used to speak, "being told what to do by others… having tests…and having deadlines." The youth worker mentioned that students were more prone to being triggered when going from one activity to the next: "Oftentimes transitions were the hardest." For instance, the transition between being at school and going to a group session could be triggering. Triggered students either reacted with an outburst *or* used a coping mechanism that they learned at HOPE. Some of the negative behaviours that students exhibited when they were triggered included: yelling, throwing, swearing, storming off, and completely shutting down/not speaking.

The youth workers "would need to deescalate the client" by walking the youth through coping mechanisms (e.g., taking deep breaths) and then mediating conflict resolution discussions between the parties who were involved. She described a scenario that she experienced and an intervention that was utilized as follows:

> *They're not allowed to be alone so tensions would get high… There were lots of different behaviour management things. So as a staff you would try to manage those to keep the group moving but there were definitely times that some of the behaviours… just completely stopped the process. We just had to stop, and we just had to process what was going on and then sometimes we couldn't even process because some youth were either so disengaged or so triggered that we would have to completely separate. So, some staff*

> *would go with some clients and some staff would go with other clients and give them different activities.*

In this example, it was not feasible to continue the activities due to flared tempers. Thus, learning to communicate in an appropriate way was part of their growth at HOPE.

The code *communication* occurred seven times. This code was used when the youth worker described mediating "Non-Violent Communication (NVC) meetings" whenever there was a conflict. NVC meetings occurred between the youth and other youth, youth and staff, *and youth and teachers*. She explained

> *NVC would happen between clients and other youth workers, too. It wasn't just the teachers… It did [happen] but there were some youths who were particularly triggered by teachers, where there were quite a few NVCs happening between the youth and the teachers.*

The purpose of the NVC was to prevent triggered students from lashing out while they communicated. The meetings involved allowing both parties to express their views, while actively trying to be empathetic to the other people who were involved. The youth worker described the structure of the NVC in further details:

> *We would go through this process called OFNR, where we would get them to express their Observations, their Needs, their Feelings, and their Requests. We [youth workers] would kind of mediate it in a way that: they were using more compassionate communication; and see[ing] from another perspective.*

When speaking about preventing students from being triggered, the youth worker said, "with that population you just have to be so thoughtful, so considerate, and so compassionate [with] how you communicate." She also mentioned that ceremonial space prompted the adolescents to communicate in positive ways because of the solemn atmosphere.

Ceremonial space was a part of being at the HOPE site. There were many Indigenous inspired practices that were used at HOPE to honour the culture of the community on whose land the camp is located. The code, *Indigenous inspired practices*, included learning about traditions and engaging in practices that were taught by one of the Elders of that First Nations community (the community will remain unnamed for anonymity purposes). The HOPE staff were taught the practices so they could lead the ceremonies with the youth. Illustrating the significance of ceremonies, the youth worker said:

> *We would have opening ceremony, and these ceremonies they were just so key because ceremonial space allows people to speak in a way that they wouldn't normally speak when they are with other teenagers and so it's a time to just build them up… It's a time to just speak really from the heart and so being able to like be in those ceremonies and to listen to what the youth would say–the words or encouragement and what they had gone through–and speaking from an authentic and really genuine space, just witnessing that healing process was profound.*

It is evident by this quote that the spiritual practices were a consistent and invaluable component of HOPE. These practices included an opening ceremony whenever anyone new arrived, smudging, and there were also ceremonies for the Circle of Courage. The Circle of Courage model, which permeated HOPE's programming is depicted in Figure 2 in the section on Indigenous Education.

Brendtro, Brokenleg, Van Bockern and Bird (1991) proposed that central values in a positive educational culture are: belonging for everyone; mastery through listening, playing, and working; independence balanced by ongoing social controls; and lastly generosity grounded in joy. HOPE adopted these values such that beads represented each of the Circle of Courage needs. Therefore, whenever a student arrived, they were given a belonging bead and over the course of their stay they could apply for a mastery bead, independence bead, and generosity bead. By applying, students had to explain how they demonstrated the criteria for that bead. Providing an explanation of the process, the youth worker shared:

> *Belonging, mastery, independence, and generosity–they had to apply to receive these… nobody had to apply for the belonging one… all the staff would come together and then they would be kind of surprised in terms of when their ceremony was. It would be like, 'we're having a ceremony this is for this person's independence bead.' Then everyone would have a chance to speak to the ways that they have seen independence in this person… It's amazing. I think it was helpful for them to hear those kind things from the staff, but the staff are saying those kind things to the youth all the time, but to hear it from their peers–to hear those things from their peers–I think was really special for them… So, when you got to see a client go through all the beads and then to their passage ceremony… it was just so beautiful to watch that whole process.*

The application of the Circle of Courage model at HOPE gave the students a chance to communicate kindly to each other, to encourage their peers, and to set a goal and work towards it. For instance, if a student applied for an independence bead, they could say I demonstrated independence by packing appropriately and without any help for a trip, waking up and getting out of bed without anyone's prodding, and doing my science homework without being prompted by anyone else. The youth worker was an advocate for the use of the Circle of Courage model in traditional schools. She said, *"It would be pivotal during that middle school age."* Thus, the Circle of Courage model infused all aspects of HOPE including the school.

The youth worker reiterated some of the pedagogical approaches that were already expressed including *relationship*, *tactile*, *personalized education*, *and place-based science,* therefore, I will focus on the role of experiential learning, which has yet to be discussed. This type of learning would often take place during group treatment sessions. The group would have an activity or challenge to overcome that involved "doing groups kind of through metaphor" for their treatment process/whatever else they were learning. The youth worker provided this example, "say we were on a hike, and it was raining and say there was some hardship going on, we would bring that into their treatment." She said they would, "ask questions to illicit reflection on how what was happening outside… related to their life and different hardship[s]… that were going on in their treatment as well." Therefore, persevering in spite of the circumstances was symbolic of persevering through treatment. It is important to note that learning new skills for coping with strains does not equate to the absence of difficult circumstances, as seen by the example experiential learning activity that she shared. Instead, the process of persevering through the difficulty and discomfort enables one to see what mechanisms worked. What thoughts helped? What thoughts did not help? What actions helped? What actions did not help? By thinking through these simple questions, students were able to connect their experiences to their treatment process, their learning, and to their reactions.

Supervisor: "We all Want to get to the Top of the Mountain, but we all Don't Have to use the Same Path"

The supervisor was selected as an interviewee because he had a broad view of the programming at HOPE. After being a youth worker at HOPE, he became a shift supervisor. He worked at the HOPE camp for a total of five years. As a shift supervisor he oversaw the daily

routines of the youth and staff, ensured that they had all of their basic needs met, helped with the addiction's treatment process, planned, and attended the wilderness trips and managed the facility (e.g., filled oil in the generator). He also worked side-by-side with the teachers to support the academic process. His work with the teachers and wilderness trips offered another perspective on science education at HOPE. The five most frequent words from the interview with the supervisor were *kids, know, think, school,* and *teachers.* The top 75 words from the interview with the supervisor are included in Figure 18 to provide a sense of what occupied the conversation.

Figure 18

The Most Frequently Occurring Words from The Supervisor's Interview

Several codes that came out of the interview with the supervisor were previously explained (see Table 21 in Appendix 1). These codes include *science pedagogy*, *mitigate strain*, *student triggered*, *transformation*, and *reintegration*. Similar to the analysis of the other interviews, the code, *science pedagogy*, was sub-coded for specific pedagogical strategies. These codes are found in Table 22. The codes that were addressed earlier will not be explained in this

section, instead, I will focus on the specific challenges that the supervisor mentioned and the code, *staff collaboration*.

The supervisor spoke at length about working with the teachers–whether it was pertaining to academics or treatment–to ensure that everyone was on the same page in terms of students' goals and recovery processes. He described collaborating to creatively produce ways for students to earn the credits they needed. For instance, he said the practical component of the course "foods" was met by students when they "cook with us. They would have portfolios where they would have to create meal ideals, learn how to grocery shop, and invent recipes." Teachers may or may not have been present at that time, and in the latter case, criteria were shared with the supervisor to help guide students and assess their learning. Providing an example of working with the teachers, he posited:

> *For instance, when you've got a kid that's needing a Phys ed. credit and you don't have a traditional Phys ed. class umm–that's where we are sitting in with the teachers and saying OK how do you want us to do this. They would give us criteria for marking and specifically for things like Phys ed or foods [and say,] 'So, when you're on that trip this weekend mark them on that...'*

If the teachers were not present on the trip, the supervisor would draft a report to inform the teacher about the attitudes, behaviour, and learning of the students. The supervisor described it as a team effort in which everybody worked together to help the students accomplish their goals.

Even though everyone was invested in the students and wanted them to do well, there were varying opinions on the best way to support students between the different groups (i.e., the umbrella organization, the provincial health care system, and the school). The lack of consensus led to some challenges, while other challenges were intrinsic to the nature of the program. The supervisor reiterated the principal's sentiment that funding for this program was a challenge simply because of the low student-teacher ratio and the low youth worker-to-student ratio. The supervisor did not deny that the HOPE camp was an expensive program to run, rather he explained: "some of these things that cost quite a bit or take a lot of resources, don't meet the criteria of meeting the masses, so they get cut and I think that's unfortunate."

Additional challenges that he brought up pertained to interactions between staff from the umbrella organization (e.g., youth workers, shift supervisors) and teachers. He said the staff

would be looking at the youths' cases from a mental health and an addictions stance whereas the teachers would be viewing it from an educational lens. He acknowledged that the teachers were "…not discounting the mental health or the addictions piece." The major point of contention was determining what the academic expectations should be for the students. He describes the scenario as follows:

> *I would be saying 'this kid can't learn because their life is just shattered, and the expectations would have to be low.' Then the teachers would say, 'no, we tested him and there's no point in having the expectations low this kid can do it.' I think those were probably the bigger struggles.*

Although the supervisor described the differing views on students' ability, the supervisor spoke respectfully about the teachers. He admitted,

> *I think having gone through that and being a bit older now, working in schools, [there was] a lot of wasted time that happened in some of those discussions and I think I would go back and do [it] differently… Just concede a bit of ground in certain situations.*

His stance on setting lower expectations for students who are dealing with addictions shifted to setting the bar higher for them. The teachers' approach to setting the bar high is witnessed by engaging in field studies, citizen science, and inquiry-based learning approaches which involve more critical thinking than traditional cook-book science labs that entail following steps like a recipe.

The pedagogical approaches that the supervisor referred to were discussed in the analysis of other interviews and for that reason I explicate the code *field studies and citizen science* and *lecture style*, which have not been explored in depth. Referring to the trips that were arranged the supervisor enthusiastically said:

> *So, we got to engage in some of these field trips where we are going to these really cool interesting places talking to park rangers. They're taking us to the park, showing us how they operate game cameras, monitoring elk herds, and things like that. So, there are these really cool events and partnerships that the teachers set up with the… park. We would go and through those partnerships be able to take part in watching eagle migration, we would get to go and help [animal] rehab centres–so there would be cool opportunities to go and do those types of learning.*

Although the supervisor did not use the term citizen science, the activities that he described would be categorized as such. The most prominent use of the term citizen science refers to research in ecology, biology, and environmental conservation that involve collecting and classifying data by those who would be considered lay in the field (Kullenberg & Kasperowski, 2016). Thus, when the supervisor described science activities in which students gathered data on bird migration (bird species, relative age, time it was seen) and helped animal rehab centres with their data collection (animal height, weight, temperature, etc.…), the students were engaging in citizen science. The involvement with animals and/or the fact that the research was significant to them may have been why those activities captured students' attention.

In contrast, the other pedagogical approach that was mentioned, *lecturing*, did not capture students' attention. The supervisor said they occasionally had "lecture style teaching moments," but for the most part other methods prevailed. He praised experiential learning as the best way for children to learn. He believed that "parallel processes" (experiences that served as a metaphor for what students were learning) solidified their learning, by connecting it to something that was real to them. He provided an example of one of his favourite experiential learning activities that was done as part of the treatment process. He described this activity as follows:

> *For every struggle [students] have I want [them] to go find a rock… They would go find a rock and bring it back. I wouldn't tell them what it was for because we wanted to really drive it home with the experience of doing it. They come back. They bring their pile of rocks and say ok we're going to carry them to the top of the mountain. So, they would load up their backpacks with rocks and we would start hiking up the mountain. At a different point we would have these debriefs and talk about how do we let things go? How do we move forward?*

The staff discussed the weight of carrying past pains, how to let go of things that needed to be released, the importance of forgiveness, and how to continue moving forward. Then they challenged the youth to let go of something and remove the rocks from their backpacks to symbolize it. He described the youths' reactions to that experience:

> *Some kids would let a few things go and some kids wouldn't and then by the time we got to the top that would be the last big debrief… I remember one kid did not let go of one rock the entire trip up, got to the top of the mountain, dumped everything all on the mountain, and there was a very public outburst about things going on with this kids'*

> *family… We debriefed that. His whole thing was carrying every rock to the top and then letting it go because people in [his] life said [he] would never be able to do something like this.*

Some of the kids would let go of a few things, while others would not, but by the time they reached the summit, they had experienced and reflected on how carrying pain can hinder progress. Students in that experiential learning session were neither forced to remove the rocks, nor expected to react in the same ways as their peers. For, they all had different past experiences and were at different points in their treatment. As a result, they would have different forms of therapy (and schooling) that worked better for them. The supervisor summarized this sentiment succinctly: "We all want to get to the top of the mountain, but we all don't have to use the same path."

Director: "It's a Shared Journey and we are Learning Alongside our Clients."

The director oversaw the programming at the HOPE camp, as well as other programs run by the umbrella organization. She worked with the organization for just over 28 years. Her background is in outdoor recreation and mountaineering. She began working at the umbrella organization as a youth worker, she then became a supervisor, and later she became a manager. She was the manager of the HOPE camp in 2005, before she became a director of the umbrella organization in 2014. Her years of dedication and her work with the HOPE camp throughout its duration is why she was selected to be a participant.

The five most frequent words in her interview were *program, kids, people, think,* and *working.* The code, *right use of power*, was unique to this interview and several of the challenges that the director mentioned were also distinct, therefore, they will be described in further detail in this section. (The codes from the interview with the director are found in Table 23 in Appendix 1.) Next to the code *pedagogy* (which is sub-coded and found in Table 24 in Appendix 1), the code *challenges* had the highest count, occurring 12 times in the interview. The word cloud from the interview with the director is found in Figure 19.

Figure 19

The Most Frequently Occurring Words from The Director's Interview

The director spoke at length about several challenges that accompanied running this program, she provided insight on the resultant question from the document analysis phase–why HOPE had lost funding–and she explained why there was no media coverage on its closure. Some of the challenges that were connected to running HOPE involved staffing, the remote location, and integrating in the HOPE community. She commented:

> *Living and working with your colleagues…it's really hard to separate those two. So, if you have too many people who are young and haven't sort of developed the maturity and the insight into who they are as people, the culture could shift and that's always the balance, making sure…we have people who are comfortable in their own skin, people who are open to–are vulnerable in their own work.*

Although it required more effort to find the right people, due to the remote location, and extended shift work, they were able to find staff who were the right fit for HOPE.

However, the partnership with the provincial health care system–which was funding HOPE–was not the right fit. The director was able to provide insight on why HOPE had lost

funding and thereby answer one of the residual questions from the document analysis phase. She explained that the partnership began in 2005 before ending in 2020. Over the years the focus of HOPE and the provincial health care system shifted. Some of the differences that affected the partnership were the epistemological beliefs of the organizations involved. The director communicated the tensions between these views clearly:

> *The medical model is very much expert based, and we are very much client based–not that we are not–I mean we bring an expertise in certain areas. The medical model implies that there is expertise over people versus coming to the table with a common goal and understanding of the work that we want to do.*

The director reiterated that "when you view yourself as the authority it's really hard to be collaborative."

One point of contention between the provincial health staff and the HOPE staff, pertained to the use of Indigenous inspired practices. Providing an example of views that were irreconcilable, the director made it clear that:

> *[The provincial health services] didn't always appreciate some of those components. we had many discussions around whether or not we should be smudging with kids and even as I say that it's just ludicrous. Our Elder did trainings with us so that we could then be teaching other people how to smudge and what that looked like and how to do it respectfully and our funder thought that kids didn't have a choice... They always have a choice. You can always pass–it's part of the process of teaching people.*

Another issue within the partnership was that the provincial health service providers wanted to fund programs that would benefit higher acuity youth, meaning those who were suicidal. However, the director said, "it wasn't safe to have kids who are suicidal in that setting" and she went on to explain that they were "too far away from advanced services." Heading in different directions with irreconcilable differences, the provincial health services pulled their funding. This occurred around the onset of the pandemic and at the same time as a tragedy in another Canadian treatment facility (the murder of a support worker). Therefore, the news outlets were preoccupied with major stories and the closure was not covered in the media.

The director said that another issue with the provincial health service providers was that "they don't understand the right use of power philosophy," which she described at length. Based

on Cedar Barstow's (2007) right use of power, the director outlined the tenets of the right use of power and described what it entailed at HOPE:

> *There is a power differential and so how do you recognize that and how do you try to neutralize it or how do you conversely use it appropriately. And we talked a lot about the role of… workers and the power that they bring in that role. Just by being an employee there is power that they have over our clients. And so, its recognition of that and a way to to utilize your power effectively if you are in an up-power position*.

Staff and teachers held a position of power compared to students. Therefore, the staff being in an up-power position, would need to navigate using their power effectively. Similarly, within staff roles there were power differentials such that the director was in an up-power position to the other staff. The director put forth that recognizing the right use of power, required reflection, and realizing that "you can do things right or you can do the right thing." However, determining what is the right thing is not always clear. The director went on to discuss the tensions of serving Indigenous peoples:

> *Right now, we are trying to figure out what our role is in that. Because we recognize that as a non-Indigenous community our role is not to be running programs for Indigenous people… What is our role? Our role is not—do we just need to provide a space and turn our site over to another organization who can be doing this, who is Indigenous? What is our role in supporting something and then getting out of the way? We don't have all the answers. We don't know.*

Her consideration for what should be done with the HOPE site and the most appropriate way to aid Indigenous youth, reflects an ethic of care, exemplifying that the staff at HOPE were on a reflective journey as they strived to do the right thing for marginalized youth.

The pedagogical strategies that the director commented on were stated by the previous interviewees, with the exception of *play-based learning* and the particular descriptions of the *relationship* code. The code *play-based learning* only occurred once in this interview, but it was an approach that the director thought was significant: She asserted, "when kids can be kids and play it's incredibly valuable." Given that the youth at HOPE were involved in the justice system and had experienced various strains, allowing them to have fun and play, enabled them to engage in experiences that they may have missed.

In addition to play, the director spoke highly about having positive student-teacher relationships. Students and teachers, by living in a shared space, were part of a community. This quote highlights the significance of relationships at HOPE:

> *The values of belonging relationships… are really critical and so it's being in relationship with people… So, whether it is the employees I work with, or the clients who I walk with, it's being able to utilize that… The shared journey is about building relationships with people and being authentic… It's that sense of being a human and we all have pasts, and what pieces of my past are important to this relationship, and if I share this story would it help this person in their journey.*

The previous quote provides insight into the kind of authentic relationships that were fostered at HOPE–relationships that removed the veneer of perfection to reveal that even the staff had made mistakes and they too were fallible. As such there was a sense of belonging, which she said "inspire[d] growth." From the director's perspective, the ability of staff and students to build positive relationships, was evidenced by teachers and staff being on a "shared journey and … learning alongside [the] clients."

Phase Two: Interview Results Summary

The director, supervisor, youth worker, principal, and teachers shared lush descriptions on HOPE and the science strategies that were utilized. They recounted several strains that the clientele faced, and they spoke about the unique ways that HOPE addressed those stressors. Each interviewee had valuable input on the pedagogical approaches that were used at HOPE and some even compared their experiences to traditional schools. As a result, there were a number of codes pertaining to pedagogical strategies. I totaled the codes from all of the interviews and compiled them in tables to provide the reader with an overview of the most frequent codes from this phase. These tables include the top 10 codes from all of the interviews as well as the top 10 codes on pedagogy (see Tables 4 and 5 respectively). In addition, I subcoded *challenges*, *strains,* and *mitigating strains* and tabulated the results (see Tables 25–27 in Appendix 1).

Table 4

The Top 10 Codes from the Interview Phase

Code	Meaning/References	Examples	Total
Science Pedagogy	Anything related to how science was taught	"it was self-directed" "take them outside… show them	199
Mitigate Strain*	How HOPE's science program reduced strain	"they could complete that course and earn credits"	79
Challenges	Challenges to teaching at HOPE	"internet was slow and unreliable"	40
Strain	Types of strains that students experienced	"addictions" "not having success in their schools back in their community"	39
Transformation	Any mention of growth, change in students	"more confident" "successfully completed & doing well"	34
Additional Teacher Tasks	Atypical roles/tasks that teachers had	"access us in the evenings because we lived on site… if they wanted to do school… we could help with that"	20
Indigenous inspired practices* (subcode MS)	Rituals/routines that were taken from Indigenous culture/learned from Elders	"honour the culture practices and… the community of the land that we are on"	20
Reintegration	References to helping students reintegrate in schools/community	"transition plan" "reengage in school community"	18
Science Content	The science material that students learned	"wildlife identification" "water runoff"	17
Empower	HOPE empowered youth through their programming.	"we kind of awoken something in them" "planting seeds… giving them…"	10

Table 5

The Top 10 Codes About Pedagogy from the Interview Phase

Code	Meaning	Examples	Count
Relationship	Positive student-teacher relationships	"the more trust they had with us the more honest they were"	44
Place-based Science	Learning related to the local environment	"we could take them outside and show them ecosystems"	30
Personalized Education	Individualized learning	"self-directed" "go at their own pace"	27
Tactile	Hands-on learning methods.	"things kids could touch and… learn from" "hands-on methods"	19
Experiential Learning	Learning through experience	"practical experiences to fulfill curriculum or learning outcomes"	16
Spontaneous Education	Unintentional teaching & learning moments	"we would use what was around to teach" "if we saw something on a hike, we'd guide the kids there"	15
Inquiry	Students inquired about things and sought answers/ problem solving	"What animal did that belong to?" "Keep their eyes open… they're going to have those questions"	13
Teacher Freedom	Teachers were free to go on trips, team teach, and plan activities	"I didn't have to get approval from the [board] to run a trip"	12
Field Studies, Citizen Sci	Real research contexts outside the classroom	"field studies where we would go to sites" "participate in citizen science"	9
Team-teaching	When 2 teachers teach a lesson/collaborate	"team taught" "coteaching"	5

The main pedagogical strategies that HOPE used were constructing positive *relationships* with the students, *place-based science education,* and a *personalized approach*. Every interviewee noted that HOPE was conducive to building relationships and that those relationships had a ripple effect on education. The supervisor explained with a confident conviction in his tone:

> *It was all about relationship…That was your greatest tool out there–it was relationship. The teachers are eating with you, they're hanging out with you, you see them in the evening hanging around, it's like living in the same house with you. Not many teachers or staff would say I'd like to live with my clients, but that was the reality of the place. You got to live with each other on that level.*

This quote exemplifies the connection between relationships and the specific location of HOPE–which being remote–required that workers lived on site during their shift. Being in close proximity for an extended period of time made getting to know each other inevitable.

Place was also instrumental for learning science because the wilderness provided unique learning opportunities. Recounting a comical learning moment for staff and students alike, the supervisor shared about a time when there was an unidentifiable sound around the site. He said:

> *So fast forward to us, being 11 o'clock at night, with a spotlight in the trees and we're looking around and we hear it; and there it was right above us three great horned owl–owlets that w[ere] using the light between the school and the staff cabin to hunt mice and so they would sit up in these evergreens at about 100 feet in the air.*

Referring to the avian discovery he remarked, "those are the types of experiences that really made it. So, you would have that experience with a kid and then you would teach them the next day. You could relate back to it." That late night inquiry and being able to observe the sights and sounds of the owls could not have been possible if the staff, teachers, and students were not residing at HOPE. In addition to place-based science education, the interviewees viewed other facets of the HOPE approach—such as personalized education, having accountability, teaching students coping mechanism and life skills, creating routines/normalcy, giving students a judgement free space, and encouraging them to mend broken relationships—as supplemental supports to students' learning.

Combined with the code *pedagogy*, the codes *challenges*, *strain*, and *mitigating strain* are especially important to this case study. These codes directly connect to the research questions:

What specific strains/stressors did students at HOPE face? What challenges–if any–did these strains/stressors pose to the education they were offered? What pedagogical strategies were used to engage this student population in learning science? What was the rationale for these strategies? Did the pedagogical strategies exacerbate or mitigate strains? For that reason, the codes challenges, strain, and mitigating strain were sub-coded. The subcodes for challenges extended beyond the challenges that strains caused to the difficulties that the HOPE school faced. The subcodes for strain indicate the specific stressors that the HOPE clientele experienced, and lastly, the subcodes for mitigating strain pertain to the way that HOPE and education at HOPE helped to alleviate strains.

The code *challenges* was subdivided into five codes, including: *clientele*, *partnership with provincial healthcare*, *remote*, *staff*, and *funding*. The clientele at HOPE required constant supervision due to their strained backgrounds and negative experiences with school. Although *clientele* was the most frequently occurring code for *challenges* (12), adverse behaviours were addressed by the staff who would "deescalate the client" and facilitate "non-violent communication." Behavioural issues that affected teaching and learning were navigated by the educators' unique pedagogical approaches for each learner, by celebrating students' successes, and by fostering positive student-teacher relationships. Interviewees were unanimous in the significance of positive relationship, which the teachers expressed created an ambiance where learning could occur. Therefore, the challenges that accompanied working with strained adolescents were surmountable.

However, the partnership with the provincial health services was clearly one in which contrasting epistemologies and differing directions could not be reconciled. The impasse between the umbrella organization and the provincial health care system ultimately led to the end of the partnership, the loss of needed funding, and the closure of HOPE. Similarly, differing views arose between the youth workers and the teachers. These disagreements focused on students' abilities and socioemotional readiness to learn, which is exemplified in this quote from the supervisor: "this kid can't learn because their life is just shattered… Then the teachers would say no we tested him and there's no point in having the expectations low." Eventually, the staff and teachers would come to a compromise. Another hurdle for teaching was the lack of reliable internet and the absence of cellular reception. This resulted in teachers using unique strategies that were suitable to their learning environment (e.g., more *place-based science).* However, the

educators handled the challenges that were under their jurisdiction to support the students and to alleviate some of the many strains they faced.

The subcodes for strains painted a picture of the types of stressors that were common to those who attended HOPE. The most prevalent strains include *addictions* and *dropping out of school*. This coincides with the correlation between being in the justice system and not having a high school education. In addition, *mental health issues*, *learning disabilities*, *broken relationships*, *traumatic pasts*, *and unstructured lives* describe the types of strains that the HOPE youth dealt with on a regular basis. The strain *rock bottom* encompassed many strains and was used to describe a student who had finally recognized how far he had fallen. However, it was also seen as a turning point for the youth. Teacher A shared, sometimes "you got to hit rock bottom before you make any changes." Similarly, having only a *few safe spaces* and *gang involvement* conveyed the danger that these students would have faced. These strains made HOPE's ability to mitigate strains integral to their success.

The interviewees spoke candidly about the way the HOPE school was used to mitigate strains and especially the educational strains that the students faced. Primarily, getting credits, having a good attitude towards school, and even finishing school were deemed fundamental to rehabilitation. Referring to the role of education in the students' lives, Teacher B conveyed:

> *I saw the role of education out there…I guess I'm a little biased, something a lot bigger… A lot of the kids that come out for addictions treatment they are contemplative…you know, they are exploring addiction. They're exploring you know if they are actually really ready to give stuff up… One common thread that all the kids had is that they had severed their relationship with school. So, I found that the role was to give kids a different form of education than what they are used to and to help them find success… I think that was one of the biggest themes to find success in education.*

He went on to juxtapose the type of schooling that the students had experienced prior to HOPE with the HOPE approach:

> *Most of the time it [school] had such a negative connotation, being in trouble so much through school, and [being] rejected so heavily by school… [A] big part of our job was showing them that didn't have to be the case… showing them they could find success, and then the other big piece was the piece afterwards of transitioning them and really getting to know what resources were in their community for them to go back to that might be*

> *successful than what they had experienced before, or just getting places to give them a second chance.*

HOPE was set apart from other schools because it gave students a clean slate, such that they could experience success. The high view of education that teachers held was shared by the other staff. Even though there were disputes about the students' emotional readiness to learn–i.e., how much schooling could the youth handle and what level of difficulty was most appropriate for them–there was no doubt that education was key for their wellness. The director viewed education as especially important in a client's "last month… because they were typically transitioning back to a school environment." Therefore, being able to get into the rhythm of schooling at HOPE and experiencing some success, provided a foundation for future academic success.

Indigenous inspired practices were also used to mitigate strains and included: an Elder who was involved with the program; the teachers, staff, and students smudging; a Teepee on site; and the use of the Circle of Courage model. When asked about the reason for HOPE's integration of Indigenous inspired practices (a question that was prompted by the document analysis phase, but remained unanswered) the director responded:

> *Our bread and butter essentially is youth work. The majority of our income is from youth services–60% of it and that's for working with young people and their families. Because there is an overrepresentation of Indigenous people in our services, we are mindful of that, and we are looking at more work with the Indigenous communities.*

Using Indigenous inspired practices was a way to address the needs of the clientele. However, by joining in those practices, it reflected a sense of solidarity between those who worked at the site and the youth. Although none of the interviewees identified as Indigenous (and aside from the Elder, I was informed that there was only one staff member who was Indigenous), HOPE engaged in respectful participation. This is indicative that they believed in the rehabilitative potential in said practices.

Being in *nature* was also believed to help foster students' inner peace; improve their ability to pay attention; and aid their overall rehabilitation journey. Teacher A shared that "being outside everyday–even just for a portion of the day–had those effects on kids, positive effects." He continued by vividly describing some of the physical changes that he observed in the students:

> *You could tell when a kid had been using hard for a long time before they came to us, and in two or three weeks the changes that they went through in terms of skin complexion, hair, the sunken eyes that disappeared… I know that's not all from nature: That's eating a balanced diet; that's getting enough sleep; that's getting physical activity; that's not using. So, like those physical changes that you can see from the moment they came in even two to three, four weeks umm, but I know that being outside, fresh air in nature played some role in that as well.*

The physical transformation that is conveyed in this quote is remarkable and once again points to the affects of place on students' wellness.

Altogether, the interviewees provided further insight on the Healing Outdoor Program and Education; the effect it had on students; and its problems and possibilities. HOPE catered to a specific demographic–youth who were involved with the justice system and were in treatment for addictions. Along with the strain of *addiction,* these students were *not attending school*; they had *mental health issues*; *learning disabilities*; experiences with *verbal, physical, and emotional abuse*; *few safe spaces*; some were *involved with gangs*, others had *broken familial relationships*, and some had even *hit rock bottom*. HOPE was a place of healing for these youths, in which a unique holistic approach supported mental, emotional, physical, and spiritual restoration. Central to HOPE's efforts was building *positive relationships*, enabling students to experience academic success, using *Indigenous inspired practices* and providing other various forms of *therapy*. The remote *wilderness* location complimented the aims of HOPE as it provided: a distant space for the youth to escape temptations, stressors, and distractions; an engaging environment for education–and particularly science education; and, as a result of being located in a secluded area, it nurtured living in community amongst the teachers, staff, and students.

However, HOPE was not without challenges. Serving strained youth presented difficulties and necessitated that the program was expensive to run, due to the low youth-to-worker ratios. A partnership with the provincial health services was the primary source of funding for HOPE. Although HOPE's integrated approach to rehabilitation aided the youth along their journey, the provincial health care service providers did not endorse the use of *Indigenous inspired practices*. Further complications arose from the provinces desire to fund programs that were for higher acuity youth (e.g., suicidal) and due to the remote location of HOPE, it was not

feasible to provide programming to such youth because of the distance from emergency services. Consequently, the partnership ended, and *funding was cut*.

Moving forward, HOPE is considering other potential partnerships so that they can continue to help youth. Standing by the importance of providing Indigenous services to strained youth (in which Indigenous youth are overrepresented), the umbrella organization is carefully contemplating their role in those endeavours as a non–Indigenous organization. Although the future is uncertain, it is evident that HOPE provided a transformative intervention for adolescents who desperately needed it. It is questionable as to whether the students would have experienced positive changes (physical, mental, spiritual, and emotional)–and with such immediacy–if they were in an urban program as opposed to a remote wilderness live-in treatment centre. Those who worked on the frontlines were in one accord: lives were transformed at HOPE and upon leaving the site, youth were able to reintegrate in society.

Thus, the interviewees' testimonials offered an in-depth look at HOPE. The resultant codes from this phase and a comparison between phases will be revisited in the major findings and discussion section. In addition, General Strain Theory and the propositions of this case will be looked at in light of the findings. *Relationship-based teaching*, the unique ways that HOPE mitigated strains, and other prominent pedagogical strategies that HOPE used, will be unpacked in subsequent chapters. In relation to the next phase of this case study, the most prominent codes from the interviews emphasized the importance of place—and particularly *place-based science* education. This focus on place and my new understanding of how being at HOPE reduced strains, prepared me for the final phase of this case study. It was time for me to experience the HOPE camp.

Phase Three: Field Observations

This section recounts my experiences of the HOPE site. I convey my thoughts, observations, and activities with the first-person narrative such that the reader is brought along the journey through vivid descriptions. Simultaneous to my visit, the location was being used by a rehabilitation program for young Indigenous men. The umbrella organization had received funding from a nearby metropolitan region to offer said program during the summer. HOPE partnered with a local First Nations community, who ran the day-to-day programming. The men, Elders, and leaders gave me a warm welcome. They understood that my presence was not to

research their program. For that reason, and to respect the time I spent with them, I do not speak about that program or those I met. Instead, I share my experiences of the site and facilities, beginning with the drive to HOPE.

Arriving at the former HOPE site was quite the adventure. The site–which is still owned by the umbrella organization–was not easy to access. I had to drive about an hour from the nearest metropolitan area to meet up with one of the umbrella organization's staff: She had volunteered to give me a tour of where HOPE had been located, and she kindly offered to drive me into the site because getting there required one to traverse a rugged dirt road and my years of city driving did not equip me for that kind of terrain. The rolling hills, large potholes, and narrow paths that bordered steep cliffs, made me all the more thankful for getting a drive. It also allowed me to experience what it was like for clients on intake, as they too had the option of being driven into the site by a staff member. As I gazed out of the passenger window at the blue sky and dense forest, I occasionally caught a glimpse of the glistening river down below (See Figure 20). A sense of wonder, excitement, and risk filled my heart.

Figure 20

*The View of the Cliff and River that was Taken During the Drive to HOP*E

Shortly after we started the drive, I lost all cellular service. This made me realize that the youth who attended HOPE were completely cut-off from social media and any strains that they faced in their home communities. I thought about the level of trust that was required for an adolescent to drive to the site with a complete stranger, knowing that in case of an emergency there was no cellular reception. I felt entirely disconnected from the outside world, but ready to focus all attention on my present place.

Upon arrival I was introduced to those who were at the site. After exchanging pleasantries, I went to the dining hall, where we had a quick bite to eat. Next, I was escorted to my living quarters. I had a large cabin with a living room and bedroom all to myself. I unpacked my things and headed back to the dining hall where I inquired about the location of the washrooms. As I was directed outside, I learned that the site only had outhouses. I had a few altercations with bugs in outhouses in the past, which prompted me to perform a thorough examination. It made me realize the obvious: Adolescents who never experienced camp life would have to adapt to new norms. Considering the majority of HOPE's clients were from urban centres, being able to complete a three-month stay in the bush without the comforts of a washroom, cellphone, and internet, was commendable in my opinion.

As I returned to the group the setting sun made it difficult to observe the site, but easy to observe the stars. The clear night's sky had never been more magnificent. In that moment, I wanted to learn all that I could about astronomy. The HOPE site was a suitable place to learn about the night's sky because there was no light pollution. Without the convenience of Google, I had to locate what looked like a dipper on my own. This enabled me to experience one of the challenges that came up a few times in the interview phase, which was that not having access to the internet meant that research depended on print materials. In spite of the inconvenience, I still felt that the HOPE site was a great place to learn about astronomy, especially since it was intertwined in several high school courses (physics, math, general science, etc.), including the frequently taken Science 100 course. I could have stargazed all night, but I was invited to join the group for their daily checkout.

The checkout occurred at the teepee, which required me to leave the main site and head down the path for about 300 meters. A roaring fire met me outside of the teepee and a smaller fire lit up the interior. I watched as the smoke from the fire billowed up and escaped towards the

stars. The daily checkout was a group therapy approach that was often done at HOPE. The interview with the youth worker contained a discussion on the daily check-in and daily check-out process. She described it as taking turns to share about one's day, feelings, and struggles. "Before bed always, we would have a check-out," she said. The use of smudging made it a ceremonial space. The youth worker shared that, "it's a time to just speak really from the heart." I found this to be true as, I too, sensed a state of solemnity. I could only speculate on how the check-ins/outs might have supported classroom relationships amongst peers and potentially alleviate strains. That being said, I instantly felt a sense of community and openness, similar to what the interviewees had spoken about in phase two of the study.

That night, instead of sleeping in the cabin, I opted to accept the invitation to sleep in the teepee. It was my first time sleeping outdoors and my first time spending the night in a teepee. The warmth of the fire filled the space and the mat that I was on was surprisingly comfortable. As I settled in, I thought about HOPE. This was their teepee. Surely their students would have had similar experiences in the teepee and/or during overnight expeditions. After the day's travels and the evening activities, it did not take a long time before thoughts about HOPE turned into a much-needed sleep.

The next day, the crisp morning air woke me. I was excited for the days adventures to begin. Immediately, the breathtaking view of the sun rising (see Figure 21) behind the distant mountains caused me to pause. As I admired the creation, my thoughts were redirected to the creator and sustainer of it all. I took a moment to express my gratitude. Perhaps the adolescents who attended HOPE experienced similar moments of prayer and reflection when they were on solos. Even though staff supervised the students at all times, the youth were allowed time for solos, which Teacher A described as,

> *built in as part of treatment… These were optional. They would start out 15 minutes by themselves at a spot close to [the site] with nothing. Couldn't take a pen, pencil, book, headphones, nothing. You–your own thoughts–in the middle of nowhere… Kids would work up to an hour and we had kids work up to 24 hours.*

For the longer solos, the staff allowed the students to have more provisions. Without any of the clients' views on solos I can only wonder as to what occupied their minds during that time. For me, that time of solitude reflecting on the risen son, was a reminder to be as present as possible. I

contemplated walking back to my living quarters, but my recollection of interviewees' discussing bears and cougars deterred me.

Figure 21

View of the Sunrise from the HOPE Site

After spending time watching the sun rise at the teepee, I trekked back (with company that included a domesticated canine friend) to the main site to use the facilities and continue making observations. I was quite pleased with the showers and sinks in the lady's bathhouse. Next, I headed to the dining hall for breakfast. I noticed a sink in the eating area, and I remembered that the director had mentioned it:

> *In the main lodge there is a small sink where all the kids and the staff would brush their teeth before going to bed at night and so you're doing those intimate things that wouldn't occur with other people. I mean normally you are at home and you're alone brushing your teeth and if you have a partner the door might be open. You typically don't brush your teeth with your colleagues.*

I began to get the fuller picture of the familial-like community that HOPE built. Another observation I made in the dining hall and kitchen was that knives were hidden. Similar to the Healing Outdoor Program and Education, the knives were locked away as a precautionary measure. At HOPE after everyone ate breakfast, they had time to do their chores. Each person had a part to play in keeping the space clean, tidy, and safe. Coming from a large family, and being accustomed to washing dishes, I was eager to help with the dishes after breakfast, but I was asked to do another task–one that would give me a taste of wilderness adventure therapy.

Occasionally horses were brought to the site for adventure therapy, and it just so happened that coinciding with my field observation, there was a visit from three beautiful horses. Since they needed water, I was invited to ride one of them down to the stream. I had always admired horses from a distance, but never been close to one. I was given the most obedient rodeo horse because I had no experience horseback riding (see Figure 22). We started off at a slow pace. Even though I held the reins, the rider of another horse directed my horse with a rope connected to the horn of my saddle. Our conversations focused on horses, their physiology, their ability to sense fear, and metaphors about our trek to the stream and life.

Figure 22

Selfie with the Horse From the Wilderness Adventure Therapy Experience

We dismounted just before the stream, and I saw for myself that the old adage was true– one of the horses did not drink. As we headed back to camp, I felt more comfortable with my horse. The rope that had been steering me was now wound around the horn of my saddle, so that I was no longer assisted. Considering there were no trails or fences to guide the way, my horse had the potential to gallop wherever he wanted. Knowing this, I took a deep breath, held the reins as I was instructed, and I spoke gently to my horse. He went the right way! The feeling of being able to steer a horse in that location is hard to describe. Since it was my first experience horseback riding, I felt very empowered. Surely this is how the youth at HOPE felt when they had done something new and accomplished similar feats.

After my invigorating morning, I was given a tour of the grounds. We walked along the trails and paused at buildings or notable features of the site for a brief explanation on how they were used at HOPE. I came across the students' cabins, the dirt basketball court and many of the other features that were mentioned during the interview phase of this study. As we approached the nearby lake, we came across a perfect space for a mini outdoor lesson (see Figure 23).

Figure 23

A Space that was Used for Outdoor Lessons and Campfires

Next, I saw a sweat lodge, which looked like a low and enclosed shelter (depicted in Figure 24). I was informed that the Elder used it with clients who desired more traditional approaches to their treatment. Recalling the issues the provincial health services had with smudging, I was convinced that they would not be pleased with the use of sweats either. As we continued the journey, we came across adventure therapy apparatuses. These included a series of tire swings, a giant seesaw, a stone maze, and a massive ropes course. As I craned my neck and gazed at the intimidating ropes course, I could only imagine how exhilarating–and frightening–it would be to climb up and scale. I thought about the physics behind the structure and its safety before my mind wandered to the teaching and learning opportunities that it presented. While the purpose of the structure was for adventure therapy, it had a wealth of potential for physics lessons. The ropes course is seen in Figure 25.

Figure 24

The Sweat Lodge that is Located at HOPE

Figure 25

The Forty-Feet High Ropes Course for Adventure Therapy

As we neared the end of the journey, I had yet to see the school. Unfortunately, since it was no longer in operation, it was entirely emptied. All of the taxidermies and learning materials were gone. They were returned to where they originally came from, donated, and/or distributed amongst the teachers and staff. However, I still got to experience the outdoor classroom, where learning occurred. The woods, meadow, stream, and nearby lake were home to all kinds of flora and fauna and with that all kinds of opportunities to pique one's interest in the sciences. I found that without the distractions of social media, I had more time to think about what I was experiencing. I observed the sights and sounds that surrounded me, as questions flooded my mind. What made that sound? What bird is circling in the distance? How did this tree break apart? What left these tracks? What is the medicinal ingredient in these traditional medicines? My questions were motivated by curiosity, and admittedly some initial paranoia about bears, which I overcame. Simply put, my questions reflected that I learned to be present.

I spent some more time with the group prior to leaving. Even though my stay was brief, I enjoyed every moment. I said my goodbyes and loaded my things into the back of the truck. The drive out seemed much faster than the drive to the site. As I looked at the site in the rear-view mirror, I wondered how being somewhere for a brief time could make such an impression on me. There was something about that place, something unique and extraordinary.

Phase Three: Field Observation Summary

Although, I could not observe the classroom interactions due to HOPE's closure, my experience of the HOPE site exceeded what I had imagined. The pictures that I had seen prior to going to HOPE and even the photographs that I had taken did not do it justice. Nothing could capture the sense that time seemed to slow down at the site. The remote location and the slower pace made getting to know others easy. Similarly, by participating in a daily checkout and ceremonial space, I felt the kind of openness and community that the interviewees discussed.

Being able to participate in the adventure therapy by going horseback riding allowed me to experience the impromptu science teaching and learning moments that participants discussed in the interviews. As well, I witnessed the self-directed nature of wilderness adventure therapy, as evidenced by my autonomy in determining when I was ready to steer. I felt as if I had accomplished something new, something that I may not have tried anywhere else due to costs, inexperience, and spending most of my time in urban centres where opportunities to go horseback riding are limited. Therefore, I was very grateful for being able to participate in programming at the HOPE site.

Prior to the field observation, I had only heard about how special the location was, but after my time at the HOPE site, I experienced it for myself. The combination of meadows, mountains, the lake, and the river made it a beautiful and relaxing space that reduced the strains of the outside world. In a more concrete sense the remote location, lack of internet, and absence of cellular reception ensured that those who were at the site were safe from troublesome influences (such as gangs). Indeed, the geographical location of the HOPE site was free of stressors. Surely the experiences that HOPE facilitated for strained youth were irreplaceable. The loss of funding for HOPE meant: the loss of a holistic intervention; the loss of a second chance for youth who desperately needed it; and the loss of the ability to transform lives.

Summary of the Data from Each Phase

The field observation, interviews, and documents that are mentioned in this chapter provided: a retelling of my experiences of the HOPE site; rich descriptions on science education at HOPE; and additional contextual information. The document analysis phase of the study revealed that HOPE operated through a trifecta with the provincial health care services, the schoolboard, and the umbrella organization, which enabled them to provide an all-inclusive approach to wellness that coupled rehabilitative treatments with for-credit schooling–in which science education was vital. The interview phase of the study not only offered perspectives on the strains that HOPE's clientele faced (with *addictions* and educational strains being deemed the most prevalent amongst the student body), but also revealed the pedagogical approaches that were used to combat those strains including: a *pedagogy of relationship*, which underpinned all courses; *place-based education*, which was used in the teaching/learning of science in particular; and a *personalized* approach to education, which was central to schooling at HOPE. Indigenous inspired practices, which were not a part of schooling, were central to the rehabilitative efforts that were used at HOPE and worked alongside other forms of treatment (e.g., wilderness adventure therapy) to mitigate strains. Finally, the field observation revealed that the remote wilderness site supported HOPE's aims by providing a safe environment for their clients and a space that was highly conducive to science education. Overall, HOPE was a place where lives were transformed and where science–of all subjects–was a catalyst for reengaging students in schooling.

In the next chapter I compare the three phases of this study in regard to the research questions. Following this comparison, I return to the propositions of the case in the chapters on the major findings and the discussion. There I present what I have alluded to thus far–HOPE is irreplaceable.

Chapter 5: Triangulating Findings from the Document Analysis, Interviews, and Field Observations

After the field study was completed, I began comparing results between each phase of the study. The use of three distinct phases–and with them–three different sources of data enabled triangulation. The term triangulation is originally applied to navigation when one uses two or more reference points to determine a specific location. Its application to research pertains to the use of three or more sources of evidence to provide a comprehensive understanding of the question, and the potential to corroborate findings (Yin, 2012). In this case study, the field observation enabled me to experience the HOPE site and its potential for science education through direct observation and participation; the interviews allowed me to learn about HOPE's science program through the verbal report of those who worked at the site; and lastly, the documents provided descriptions on HOPE from a number of different authors. Thus, these three promoted the gathering of multiple understandings of the case and it enabled me to crosscheck findings.

Therefore, this chapter presents the findings from each phase of the study, in which I total and tabulate the resultant codes. I also highlight discrepancies and underscore commonalities, which I then address in further detail in subsequent chapters. In addition, I use infographics to give the reader an overall view of the findings as they pertain to *strains*, *mitigating strains*, and *pedagogical approaches*. I organized the chapter based on the research questions such that the overall findings for each each question are presented in consecutive order. Therefore, I begin with the first research question.

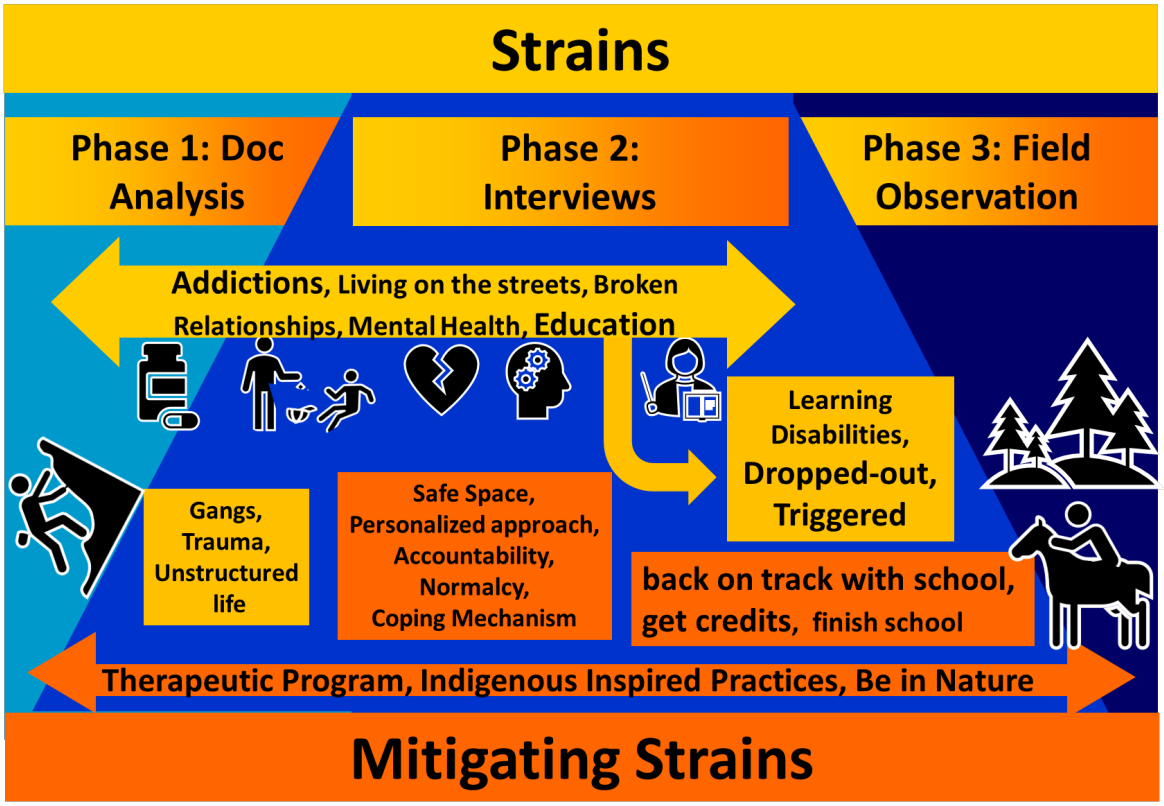
Research Question 1: What specific strains/stressors did students at HOPE face?

The document analysis phase and interview phase of the study provided the most information on strains. Unfortunately, the site observation occurred after the closure of HOPE and since HOPE ceased operations, there were no strained youth who were a part of the study. In the first phase of this research the codes *addictions*, *living on the streets*, *education*, *broken relationships,* and *mental health issues* described the types of strains the HOPE clientele faced. All of these stressors were echoed in the second phase of the study. A visual of the subcodes for

strains and *mitigating strains* that illustrates the phase in which each subcode was found is in Figure 26.

Figure 26

Side-by-side Comparison of the Codes for Strains and Mitigating Strains From Each Phase



The infographic shows that even though the strains from the first phase of the study were reiterated in the second phase, the interviewees were able to elaborate on those strains. Their descriptions enabled me to build a profile of the students who attended HOPE. Specifically for the strain *education*, interviewees spoke candidly about the certain types of strains, such as *leaving schools*, *being triggered* at school, and *learning disabilities*. New strains that the interviewees mentioned included the clientele experiencing: *physical/verbal/emotional trauma*, *gang involvement*, and *a lack of structure in their lives.* Both phases indicated that addictions were the primary strain that all of HOPE's youth experienced, with education being a secondary strain that was common to them. Although not every student experienced the rest of strains, such

as gang involvement, being homeless, mental health issues, broken relationships, physical/social/emotional abuse, learning disabilities, or dropping out of school; the identification of these strains emphasized the complex background of the student population.

The findings from both phases indicated the intertwined nature of strains and the capacity for one strain to generate more strains. The longest news article from the document analysis described that a consequence of the adolescents' struggle with addictions, was "their relationship with family deteriorate[d]." Congruently, Teacher A identified broken relationships as an additional strain that HOPE's students faced, which stemmed from addiction. Describing their stressors, he said:

> *The other one was relationship pieces. So, they burned a lot of bridges with family friends, schools, whatever it may be. So, how do you start making amends with those people that mean something to you: parents, siblings, cousins, maybe close friends that were positive supports in their life? How do you start mending some of those bridges that you probably burned along the way?*

Teacher A realized that some of HOPE's students were estranged from their loved ones because of addictions, but he also believed that there was a way to restore those relationships and alleviate said strains by making amends. Another strain that was a product of addictions was the detriment it posed to their physical/mental faculties. The youth worker briefly addressed this in the following quote, "depending on how severe their drug use was, sometimes their cognitive ability was really impaired." Thus, the strain of addiction was found to be compounded with other strains.

The interview phase of this study identified the strain of gang involvement as being intertwined with additional stressors. Although the majority of youth at HOPE were not gang members, there were some who were. This strain can have a number of connections to other strains such as experiencing physical/sexual/verbal abuse through initiation, dropping out of school, etc. However, the youth worker noted a student, "had gang involvement and he had a really hard time trusting people." Therefore, this strain certainly would have affected his relationships in all areas of his life.

By comparing the first and second phases of this study, I was able to gain a wider periphery on the connections between different strains and how they complicated the lives of

HOPE's youth. For more information on the top 10 codes for strains–i.e., the combined total from the document analysis and the interviews, see Table 6.

Table 6

The Top 10 Codes for Strains from Every Phase of the Study

Code	Meaning/References	Examples	Total
Total Codes for Strain	Types of strains that students experienced	"addictions" "not having success in… schools"	48
Addictions relapse	Anything about illegal drug use	"relapse" "struggling with addictions"	12
Dropped or failed in/by school	Leaving school or failing in school	"they weren't attending school" "being rejected… by school"	8
Student Triggered (ed strains)	Instances when a student is agitated	"it was a really triggering atmosphere for them" "get up and leave"	7
Mental health issues	Struggling with negative thoughts/ suicidal ideation	"suicidal ideation"	6
Learning Disabilities	Affected cognitive processes (reading, writing, math, reasoning, etc.)	"learning disabilities…cognitive ability severely impaired"	4
Few safe spaces/ on the streets	Not having a safe place to stay	"very few places away from here where you feel safe"	3
Physical/Verbal/ Emotional abuse	Suffering trauma through various forms of abuse	"telling them they're a failure" "traumatic past"	2
Broken relationships	Not on speaking terms with friends or family	"bridges that you probably burned"	2
Gangs	Being involved in a gang	"gang involvement"	2
Unstructured lives	Not having daily routines	"very unstructured situation"	1

Research Question 2: What challenges did strains pose to the students' education?

Another interconnection between strains was the negative affect that the strain of *addiction* had on education. If unimpeded, this negative effect reverberates to cause other known strains, which includes negative secondary school experiences and *dropping out of school* entirely. Once again, both the document analysis phase and the interview phase mentioned the links between strains and negative schooling experiences. However, the interviewees provided more depth and detailed examples that illustrated the challenges that strains posed to students' education.

A primary product of addictions is that it eliminates the opportunity for education in an institutional setting. Students are not permitted to possess drugs on school property or to be under the influence of them while they are on the premises. This rule was enforced at HOPE. Teacher A described the events that transpired when students broke this rule:

> *We had kids try and umm sneak narcotics onto site, whether that was cigarettes or whether that was something–a lot harder pills. We're a clean site. So, that was grounds for dismissal. We're not a prison so you don't strip search kids. You search their belongings, you search their clothing, but obviously if there's a will to get things in, it's going to happen because we can't do that. But we also try to focus on the trust piece. So, we're trusting that you are coming on to site and you're clean and sober and we're expecting you to be clean and sober while you're here.*

Students who smuggled drugs on the site were dismissed from the program. Considering that the program was for rehabilitation and the detrimental affect of having narcotics around recovering addicts, the policy was firmly enforced. However, there was a delicate balance between suspicion and trust, in which students were expected to be sober.

Along with removal from educational institutions, strains prevented students from functioning at their grade level. In the document analysis phase of this study, a teacher was quoted in one of the articles saying that because the students had been out of school for years, "they were way behind." The director elaborated on how far behind the students were:

> *The school probably did grade ranges from grade 3 to grade 12… I don't know if they had curriculum for elementary school, and the reality is that we had kids who developmentally and academically were at an elementary level, and we had kids who one*

> *year graduated and completed a university course [while at HOPE]. So, there was a huge range.*

In this quote the director is careful to not homogenize all of the students at HOPE as being behind grade level as there were exceptions. In this example it is important to note that the youngest students who attended HOPE could have been in sixth grade, the oldest could have been in twelfth grade, and the majority of HOPE's clientele were in secondary school. She also highlights that it was not just an academic delay for some of the students as there were developmental issues as well, which placed students behind their expected grade level.

The combination of being out of school and drug use also affected the adolescents' ability to learn. The youth worker explained, "depending on how severe their drug use was, sometimes their cognitive ability was really impaired. So learning was a really hard process for them." Therefore, earlier on at HOPE there was an emphasis on treatment to help the adolescents stabilize. The supervisor said, "when they are out there, education may not be the biggest thing that they need to do at that point in their addictions journey" and Teacher A concurred that students needed to acquire "coping skills. So, how do you cope with cravings." He went on to say that "ideally, some of those cravings had already been kicked" by being in a remote wilderness location. Given these circumstances–and especially considering their past history with schooling–students at HOPE were easily triggered. As the youth worker mentioned, due to the power dynamics in the student-teacher relationship, "sometimes just having a teacher or just being in school could be a trigger." Since schooling had a negative association for the students who attended HOPE–and because they experienced a number of other strains–it was difficult to learn.

What the students learned and when they learned was also disturbed by stressors. Teacher B provided a few examples of how these strains inhibited learning. Referring to what was restricted in science he said, "The labs–it was a lot more the chem labs and stuff like that we weren't able to get to and we weren't allowed to do it. A lot of the time it was too dangerous." Working with strained individuals meant that extra precautions needed to be taken, which meant that certain methods for learning had to be forgone. In addition, strains influenced when students were emotionally ready to learn. Teacher B shared an example of this:

> *A kid would come to the classroom and just lie on the dog bed with my dog and for the whole period. Just lie there–not say a word–and pet my dog sometimes and fall asleep…*

> *That wasn't always like a big issue. You know for me, what that showed was you were able to come to school and fall asleep and feel safe there… Maybe there are very few places away from here where you feel safe enough to sleep. So, it was so much more about seeing the whole student and understanding what was behind it.*

In this poignant example, whatever strains the student was dealing with had prevented said student from having a restful sleep at night, which made the student too tired to learn and perhaps too distraught mentally/emotionally to focus on academics. Instead of forcing the youth to do schoolwork, Teacher B gave the student the peaceful space that was needed and allowed his dog to comfort the student. Again, this points to the understanding of the need to put certain aspects of the students' treatment/healing (the need for sleep) before other aspects of that healing process (education).

Thus, there were various ways that strains interfered with schooling. The first phase of this study provided a skeletal outline of the challenges that strains produced when it came to education. The document analysis was complimented by the second phase of research which resulted in powerful examples of how strains operated and were handled in educational institutions. Given these challenges, specific pedagogical strategies were used to engage the youth at HOPE.

Research Question 3: What pedagogical strategies were used in science? Why?

Every phase of this study–document analysis, interviews, and field study–provided several pedagogical approaches that were found to be efficacious for teaching science and teaching in general. In the first phase of the study the codes *personalized education*, and *relationship* described the types of teaching styles that were used. These styles were accompanied by *visual aids, tactile objects*, and *wildlife identification*, as evidenced by their abundance in the museum-like classroom. The findings from the first phase of the study were corroborated in the second phase, in which interviewees spoke highly of the need for—and success of—building positive *student-teacher relationships*, a *personalized approach* to education, and the use of *tactile* teaching tools. In addition to these codes, *place-based science education*, *spontaneous education, inquiry-based learning,* and *field studies* made the top 10 list of codes related to teaching, which is found in Table 7. Unlike the second phase of the study which generated new codes, the field observations confirmed the unique potential that the HOPE

site had for *place-based learning* and the importance of *relationships* at HOPE. Figure 27 shows the pedagogical strategies that were found in each stage of this study.

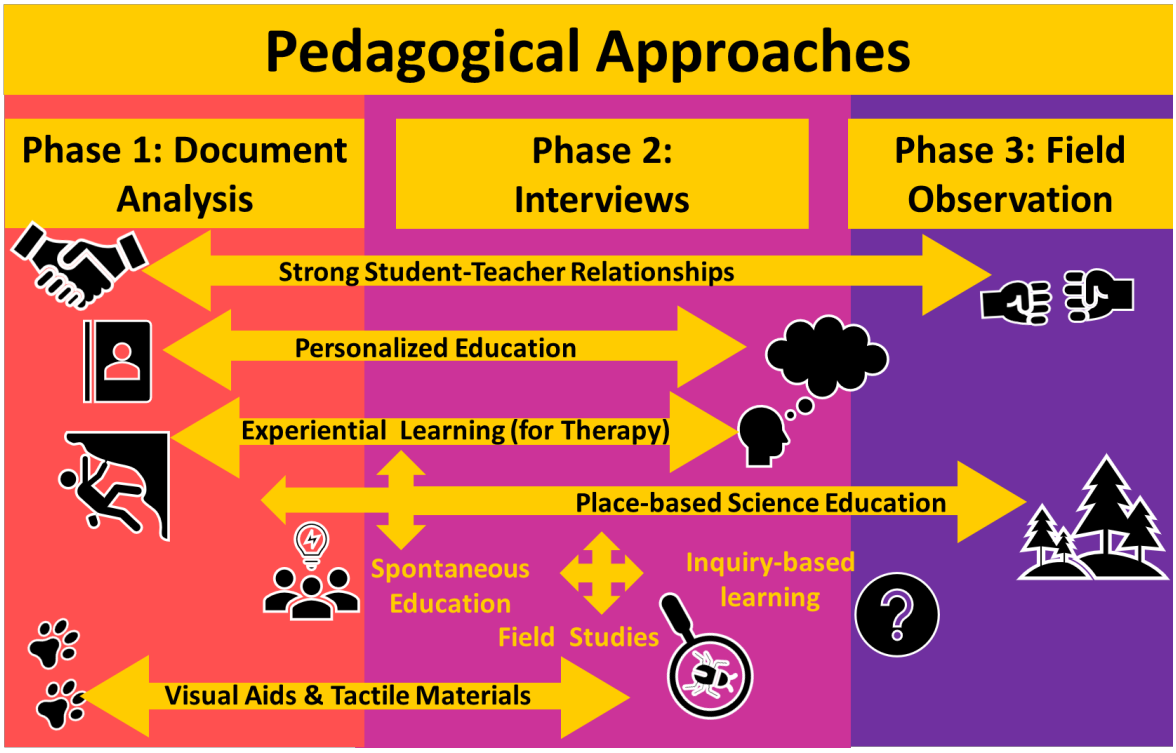
Table 7

Top 10 Codes for Pedagogy From All Phases of the Study

Code	Meaning	Examples	Count
Relationship	Positive student-teacher relationships	"the more trust they had with us the more honest they were"	44
Place-based Science	Learning related to the local environment	"we could take them outside and show them ecosystems"	30
Personalized Education	Individualized learning	"self-directed" "go at their own pace"	27
Tactile	Hands-on learning methods.	"things kids could touch and… learn from" "hands-on methods"	19
Experiential Learn (for therapy)	Learning through experience	"practical experiences to fulfill curriculum or learning outcomes"	16
Spontaneous Education	Unintentional teaching & learning moments	"we would use what was around to teach" "if we saw something on a hike, we'd guide the kids there"	15
Inquiry	Students inquired, and problem solve.	"What animal did that belong to?" "they're going to have those questions"	13
Teacher Freedom	Teachers free to go on trips, team teach, etc.	"I didn't have to get approval from the [board] to run a trip"	12
Field Studies, Citizen Sci	Real research contexts outside the classroom	"field studies where we would go to sites" "participate in citizen science"	9
Team-teach	Teachers collaborate	"team taught"	5

Figure 27

Side-by-side Comparison of the Codes for Pedagogical Approaches From Each Phase



The top 10 codes related to teaching provide a sense of what education at HOPE entailed. Although the lower seven most frequently occurring codes (*team-teaching* (5), *field studies and citizen science* (9), *teacher freedom* (12), *inquiry* (13), *spontaneous education* (15), *experiential learning* (which was mainly associated with therapy, 16), and *tactile* (19)) were employed at HOPE, combined they make up 47% of the occurrences of the top 10 codes related to teaching (89/190). Since these codes were described earlier and because the interviewees expressed a resounding recognition of the value of relationship-based teaching, place-based learning, and *personalized education*, the lower seven codes will not be discussed at length. However, the top three most frequently occurring codes—namely *strong student-teacher relationship* (44), *place-based science education* (30), *and personalized education* (27)—will be further explicated. The importance of these pedagogical approaches and their interplay with strains will be addressed in the following section.

The interview phase of this study provided a resounding sense that the role of education at HOPE was to reconnect these students with schooling. As mentioned before along with addictions, schooling was a strain that all of the HOPE clientele experienced. Therefore, the school's approach was to provide students with opportunities to experience academic success. The students' perspectives about HOPE–which were found in the document analysis phase–affirmed that "accomplishing something" and being able to, "do something well" were meaningful experiences in their healing journey. The supervisor described the teachers' stance on leading the students towards achievement, as follows:

> *Any kid that came through [HOPE]–whether they were there for a week or 3 months–they wanted them to leave with one credit, right, something positive, something that was moving them forward. Even if it was a small step, it was moving them forward. It was a small push that they wanted kids to leave camp with one credit and start getting them back on track.*

The teachers reiterated the importance of students earning credits. Teacher B stated:

> *A lot of times we would try to start them off on some sort of material or some sort of course that was going to give them kind of immediate gratification that was going to get them a credit or a few credits right away just to get them to buy into school a little bit.*

Science played a central part in this endeavour. Teacher B explained, "science [100] was probably one of our most popular courses… it was a fairly short course that with some concerted effort you could get through pretty quickly." Along with the duration of the course, a students' ability to attain credits was owed to the pedagogical approaches that were used.

The use of *personalized education* was recounted in the first and second phase of this study. The document analysis revealed that students had an individualized experience at HOPE. Similarly, the science assignments that were evident in the Facebook album, such as project bat house, the game camera activity, solving animal evidence mysteries, and the field studies, were process oriented, as opposed to product oriented. This means that students were not limited by the need to get predetermined results. For instance, if they were unable to capture an animal on camera, that was a learning experience in which they had the chance to try again. Therefore, learning was always occurring. Correspondingly, there was no designated timeline. Ideally students would earn credits before they left, but the adolescents determined the pace of their learning. The youth worker described it in the following way:

> *So, I think being able to have it [school] as part of treatment was very valuable and so there were smaller numbers of students and there were always two teachers. So, it was more like do at your own pace and receive support from the teacher.*

This quote not only exemplifies the importance of going at their own pace, but also explains why HOPE was able to adopt this strategy: Mainly, there were not many students, which enabled the teachers to give attention to the individual needs of each learner.

The low student-teacher ratio supported *relationship-based pedagogy*, which underlined all of HOPE's activities. Even though there was only one explicit reference to relationship in the document analysis, the interviewees were unanimous in explaining that every aspect of HOPE was saturated in building positive relationships. Teacher B succinctly comments, "I would say that education at [HOPE] was 100% relationship-based, and I would say that was the underlying pedagogy of it." HOPE was successful in growing these relationships because of the unique live-in dimension to their programming. Based on my field experience, I concur that being in a remote location without cellular service and a reliable internet connection was conducive to getting to know the people who shared that space.

The location was also advantageous for *place-based science learning*, which was another pedagogical approach that permeated the success of the Science 100 course. Every phase of this study corroborated the exceptional learning opportunities that the *wilderness* location presented. The supervisor praised the way that the teachers made the most out of where the school was situated.

> *The one beauty of being in the wilderness is that it adds a very unique learning environment… So, they would be able to do a lot of wildlife identification or things of that nature and so that usually was the hook to getting them to ease back into being used to the classroom–being used to being around teachers... Not going in too advanced with something that you would bang your head against the wall. It's pretty easy… We're out in this really cool space and this is something I chose, so, I'm going to do this course that is geared towards that, and I mean the teachers got really creative.*

Even though the remote location did not support contemporary teaching methods such as, using online resources, it presented the possibility for *place-based science* education, which students found engaging. Correspondingly, the land was also beneficial for mitigating strains. The use of the land in alleviating strains will be discussed in the next section.

Research Question 4: Did these pedagogical strategies exacerbate strains or mitigate them?

All phases of this case study indicated ways that HOPE mitigated strains, but only the interview phase described the strains that were experienced by students who attended HOPE. At a first glance this may seem as if there is a discrepancy between the phases, however, that is not the case. I could not draw conclusions about students' strains from the field observation because at that time there were no students at the site, because the program had already ceased operations. Furthermore, even though the documents did not recount the strains that were experienced at HOPE, the strains were inherent to working with this clientele in an educational setting and therefore, these stressors are expected.

Assessment was one of these anticipated strains. Prior to selecting courses students were assessed to determine their grade level (as opposed to their documented grade, or the grade that they should be in based on their age). It is important to recall that many of these students had been out of the educational system for a few years, so a recent assessment of their abilities was necessary. It was also used as a baseline to inform the teachers and students on the personalized approach that would be taken. The assessments indicated students' strengths as well as weaknesses, however, they became a stressor when there was a discrepancy between the results and the grade level that students felt they deserved. The supervisor provided an example of this issue:

> *A kid might come in thinking I'm in grade 10 and you know they missed a lot of school and thinking that I'm in grade 10 and really, they haven't finished grade 9–sometimes grade 8–and those introductory tests reflect that, and it can be very tough to tell a kid, 'no, you have to take [this] material here to progress.' …The teachers do have to rely on you know working with the frontline staff because you'll get all kinds of [outbursts] and emotions coming out of that because they're basically thinking that you're calling them stupid… There's a grace and a lot of care and compassion even in that testing piece because they might have a different idea of where they are at compared to where they might actually be at.*

The scenario that the supervisor described was not a one-off. In this example the teachers exercised their position of authority by not allowing a student to take the higher-level course because the student was not prepared for that course. The student viewed the refusal as a

personal attack on their intelligence, which resulted in a dispute early on in the program and an initial distaste for education by the youth.

The in-take test was not the only test that exacerbated strains. Summative exams exacerbated educational strains. The supervisor described another incident that was related to testing.

> *The teacher caught a student cheating on an exam, and we had to have this conversation about you know retaking the test and things like that… This spun this kid in such a negative stance and then also into some dangerous behaviour… cheating was a catalyst. We were trying to work through that, but this kid was not hearing any of that… During that process when the door was slammed in our face, we tried to save it, being there for this kid, and ultimately years later this kid also finished school… It was a bit of those tougher situations that tough love that spun this kid into the right direction.*

In this instance, the stressors that were created at HOPE, partly due to the use of a final exam and mainly a consequence of a student cheating, resulted in unforeseeable events. The students' immediate response–outbursts and dangerous behaviour–indicated that strains were exacerbated in this case. However, the long-term effect, being able to finish school, is evidence of a reduction in strains particularly, those that are associated with dropping out of school.

Another example of strains that had an immediate exacerbating effect but a long-term positive effect, pertained to other disputes. Although the youth worker said that some of the adolescents "had a hard time in school—not all of them—and sometimes it was a really triggering atmosphere for them," the interpersonal issues with the teachers would result in more outbursts. Therefore, the youth worker "would have to go and do little conflict resolution… NVC [non-violent communication] meetings." In this example, even though the outbursts were unhealthy, working through the process and learning better ways to express oneself was beneficial. Therefore, being able to intervene immediately after a strain was exacerbated was essential.

HOPE's capacity to intervene after strains and lessen strains was an accumulation of different factors. The field observation enabled me to experience how the combination of HOPE's remote location and *being in nature* produced a stress-free environment. The document analysis phase of the study revealed that *wilderness adventure therapy* was at the forefront of students' rehabilitation and through the field observation I sampled how success in wilderness

adventure therapy could combat strains. Although several documents from the first phase of the study placed HOPE's education in a positive light, they did not speak specifically about strains, rehabilitation, or alleviating stressors. Nonetheless, when interviewees were asked about the contributions of HOPE's school and science education on mitigating strains and rehabilitation, overall: They believed that it was fundamental to rehabilitation, especially the further along the client was in their treatment. In addition to the ways that education at HOPE helped with rehabilitation and more specifically with combatting strains, there were several other facets at HOPE which supported that endeavour.

The codes for mitigating strain could be categorized as those that were directly related to education and those that were indirectly related to education. For instance, *therapeutic programming*, *being in nature*, *personalizing their approach*, providing *accountability*, helping clients to have a sense of *normalcy*, teaching them *coping mechanisms*, *and* giving them a *safe space,* are considered indirectly related to education because they apply to HOPE's programming as a whole (therapy and schooling). Whereas, the codes *get credits*, *back on track with school*, and *finish school* are related to schooling at HOPE. Given the experiences of this demographic with education, the codes for mitigating strains that are related to schooling are of particular interest.

Altogether the top 10 codes for mitigating strains are found in Table 8. *Getting credits* was the most frequent code (24) and the main way that education at HOPE helped students to combat the strains that are associated with school failure. As a result, success in schooling at HOPE was as the director said, "an invitation to get back into a learning environment." In the words of Teacher B, "a very huge percentage of [HOPE's students] would go back to school… or find success in school or even go through and graduate and get into programs and get work experience and that was feedback… on a regular basis." Considering that education was the most common strain amongst the youth next to addictions, certainly, redressing issues that students faced in traditional education was paramount for mitigating strains.

Table 8

Top 10 Codes for Mitigating Strains from All Phases of the Study

Code	Meaning/References	Examples	Total
Mitigate Strain	How HOPE's sci reduced strain	"They could complete that course and earn credits"	85
Get Credits	Earning high school credits	"Get their school credits" "Science was quite popular… it was going to…get them credits"	24
FNIM inspired practices	Practices from FNIM culture/taught by Elders	"honour the culture practices and… the community of the land that we are on"	20
Back on track with school	Positive relationship with school	"Get them back on track academically" "Getting them back on track to… finish"	7
Therapeutic Programming	Various forms of therapy to help	"therapeutic programs"	6
Being in Nature	Stress relief related to being outdoors	"Being outside was their new happy place"	6
Finish School	Getting a high school diploma	"Complete their high school diploma"	5
Accountability /one-on-one support	Hold them accountable to learning, recovering	"how grateful he was that there were teachers that were holding him accountable"	4
Normalcy/ Life skills	Having a daily routine	"Plant seeds…giving… a garden of life skills"	4
Personalized Approach	Personalized care in all areas of HOPE	"Do at your own pace"	3
Coping Mechanisms	Strategies to mitigate conflict/temptations	"The debrief process encompassed those things… kids could be brutally honest"	3
Safe space	low strain place	"Some of those cravings had… been kicked"	3

Along with earning credits, *Indigenous inspired practices* were a prevalent part of HOPE's work to mitigate strains. However, the phases of this research suggest a discrepancy in the organization's perceptions of *Indigenous inspired practices*. None of the documents explicitly mentioned the use of said practices at HOPE. Although the teepee was visible in the video and a sharing circle was obviously used, there was no direct mention of it or why it was used. Similarly, a student perspective from the longer article was that "they were passing this feather around and doing… weird stuff that I had never seen before." The author of that article entirely bypassed what this student was referring to and at no point was it clarified.

Yet, both the youth worker and the director spoke about the importance of these practices. Indeed, smudging was viewed as a valuable rehabilitative tool. They supported smudging even when the funders were against it. The program had an Elder who facilitated special ceremonies and trained the staff on how to properly conduct smudges. Furthermore, the Circle of Courage model was implemented throughout all of HOPE's programming, in that students could demonstrate how they met a Circle of Courage need through their experiences in school, treatment, or even during their free time. Additionally, the field observation affirmed that those aspects were still part of the HOPE site (e.g., the teepee). The interview with the director explicated that those practices were used "because of the land that we [HOPE site] are on." Regardless of what programs take over, the land remains the same and the respect for it, implies that *Indigenous inspired practices* will continue to be a staple at HOPE. These practices were utilized as a preventative measure–as opposed to a reactionary way of addressing strains. However, the lack of advertisement about them is indicative that perhaps speaking about HOPE as a site for wilderness adventure therapy, would be more appealing to the target audience. Irrespective of what was presented in the promotional materials, it is clear *that Indigenous inspired practices* were a key component of HOPE and used to help clients along their rehabilitation journey.

Summary of the Comparison of Findings from Each Phase

Comparing the findings from each phase of the study helped to corroborate: the types of strains that the youth experienced; the pedagogical strategies that were used in light of those strains; and the affects of said strategies on mitigating and/or exacerbating stressors. Also, by comparing each phase, I was able to identify discrepancies in the way that HOPE was presented–

i.e., the silence in the written documents about the use of *Indigenous inspired practices*. This pointed to a tension between what was advertised and what was delivered, which will be explored in further detail in the discussion section. What is apparent is that HOPE was an intricate program that had many facets.

Through this comparative analysis of the research phases, I discovered the complexity of strains and the complication that they caused for the youth. Strains were interconnected. One strain could lead to another, such that learning was inhibited, and teaching methods were restricted because of *addictions,* trust issues from *gang involvement,* the repercussions of *emotional/physical/verbal trauma*, and/or cognitive impairment. Moreover, the complex effect of strains was evident in that some events had an immediate response that illustrated strains were exacerbated, while the prolonged response was that strains were alleviated. This is exemplified when a student who cheated received tough love, which *triggered* dangerous behaviour in the short-term. In hindsight that student felt HOPE kept him accountable and ultimately supported his pursuit of finishing school, which is a reduction in a stressor. This pointed not only to the complicated nature of strains, but also to the discernment that is needed when addressing strains.

Altogether, this comparison revealed the many layers that pertained to teaching strained youth. The students at HOPE had complicated lives that interfered with their ability to learn and for many of them resulted in prolonged absences from educational spheres. HOPE was a space where they were reconnected to schooling and reengaged in learning. Through fostering relationships, earning credits, and making strides in other areas of their life—such as being sober—HOPE was a place where strained youth could experience positive successes. However, HOPE was not strain-free. The youth experienced strains while in the program, but this created opportunities through which the adolescents learned how to deal with said strains in a positive manner. The expertise of those who worked at HOPE and their genuine care for the adolescents supported many youths on their healing journey. Thus, HOPE's unique and holistic approach was ideal for addressing the intricate challenges that strains presented.

Chapter 6: Major Findings on The MESS of Strains and HOPE's Ts of Teaching

In this chapter I delve into the specific challenges that *strains* posed for teaching and learning, as well as the *pedagogical strategies* that were used to *mitigate strains.* More specifically, the effects of students' prior strains on their ability to learn is explicated using the acrostic, MESS, which describes issues with motivation, evaluation, study, and speech. The specific ways that HOPE addressed those effects on a holistic program level (i.e., through therapy and schooling) is described. This is followed with a deeper exploration of the top three pedagogical approaches that were used at HOPE, which include *relationship-based pedagogy*, *place-based science education*, and a *personalized education*.

Strains and Schooling: Identifying the MESS

The interviewees expressed that strains affected teaching and learning in the following areas: motivation, evaluation, study, and speech (MESS). In other words, strains could make a MESS of educational efforts at HOPE if they were not addressed. Every interviewee reiterated that the students at HOPE had a tough time in their previous schools and that prior to HOPE some students had dropped out of school entirely. In the words of Teacher B, they had "severed their relationship with school." Consequently, getting back into the rhythm of schooling was an adjustment for the adolescents, which may have been met with a lack of motivation. Without hesitation Teacher A said, "one of the biggest challenges for [them] was the motivation piece." Due to strained relationships with the educational system, it was expected that upon arrival students may be unmotivated or unwilling to work.

Evaluations were another area that was hindered by strains. According to Teacher B, Tests were part of schooling at HOPE and were done on intake to get "a baseline as to where to start out." These tests would determine, "if [students] were completely illiterate and starting from zero and if [they were] a couple grades behind or if [they] were kind of close to where [they] should be." Final exams were another form of evaluation that was used to assess students' engagement with the courses they took at HOPE. The HOPE clientele–having been disconnected from school–experienced consternation towards testing. All of the interviewees spoke about testing to some extent and the pressure that students felt. The youth worker explained the issue as:

> *A lot of things that are naturally embedded in the system of school–it's not even a fault of the teachers–it's just a fact that tests are coming up or homework is due… puts time pressure on these youth, who already are experiencing so much internal conflict.*

Thus, time pressure and having hard deadlines, which were due to testing was problematic for the strained youth at HOPE and created an added stressor.

Another area that was impeded by strains was students' ability to study. This was in part affected by the educational strains of having *dropped out of school*, being below grade-level, and not being accustomed to the rhythms of schooling; but also, it was affected by the prevalence of *learning disabilities* amongst the HOPE clientele and the other issues they faced. According to the director, the students at HOPE who had the most difficulty learning included: "kids who developmentally and academically were at an elementary level." Teacher B, said youth who were "completely illiterate" struggled, along with those that the supervisor said had, "mental health issues." For this reason, arduous text heavy assignments/courses and lecture styles, were not well received teaching strategies. Teacher B found greater success with methods that "involved less reading." However, the type of learning materials that could be utilized at HOPE to help the students with their studies were limited due to safety restrictions that are associated with keeping strained individuals safe (i.e., not allowing access to sharp tools or potentially dangerous objects). Therefore, strains had a negative effect on students' abilities to study and the resources that they could use to aid their learning.

The last area in which strains made a MESS was speech. Depending on how the teachers addressed students, communication could have been another barrier to teaching and learning. Students were triggered when they were confronted about their academic progress. Once a student was triggered, the ensuing behaviour from both parties could inhibit learning and as the supervisor commented, cause an adolescent to go into "such a negative stance." Similarly, communication issues amongst the youth also interfered with learning. The youth worker recounted that one youth could, "trigger the other and they would start yelling or they would storm off… So, one youth worker would need to go and help deescalate the client… [and] that was a common experience… these types of behaviour managements." Thus, strains led to difficulties communicating effectively.

Although the MESS that occurred because of strains affected schooling in general, it also interfered with the teaching and learning of science in particular. Indeed, evaluation methods

were specifically altered in science courses, as the use of potentially unsafe physical labs were replaced with, what Teacher B referred to as, "on paper labs… it was more like a mock lab… we would walk through the scientific method with some data and the data would be provided." In addition, the affects of strains on evaluation and studying would have been pertinent to the Science 100 course because it had a final examination, which covered all the course content. Overall, issues with motivation, evaluation, studying, and speech were not limited to any particular aspect of HOPE's programming. The barriers to teaching strained individuals were expected by the staff and educators at HOPE. Therefore, their ability to *mitigate strains* and help the adolescents on their rehabilitative journey was an integral part of working at HOPE.

Mitigating Strains and Schooling: Handling the MESS

HOPE was not exempt from the influence of strains and the presence of educational stressors, however, HOPE utilized methods to decrease the effects of said strains. This is indicative that the teachers and staff recognized the residual effects of strains on learning and that they strategically created techniques for mitigating strains. In this section, I describe how HOPE tactically targeted the MESS to address issues with motivation, evaluation, study, and speech. The interventions that were used to mitigate the MESS were both preventative and reactionary.

In order to redress unmotivated students and their disconnect from education, the teachers at HOPE sought to help them *get credits*. Teacher B describes this strategy as a way "to get them to buy into school." Therefore, teachers suggested that students start with a course that they could complete while at HOPE. Science 100 was a for-credit course that not only piqued students' interest but also was one they could finish while at HOPE. Teacher A explained the appeal of that course as follows: "Science 100 was a popular course, because it was the shortest in length. It didn't require a lot of reading and writing like English and social studies do, so they could complete science while they were with us and earn [course] credits." By earning credits students experienced academic success, which was believed to motivate them to continue. After receiving a credit, the strategy was personalized to the student based on whether they wanted to tackle a tougher course that they needed to graduate and make use of the assistance they had or enroll in courses that were perhaps easier to pass and required for trade school/work. Teacher B explains:

> *Depending on where the kid was at a lot of times, we would try to start them off on some sort of material… that was going to get them a credit… right away…Then… I would encourage them to take courses that they weren't very good [in] because they had the undivided attention of a teacher that they could work one-on-one with and since they needed it to get where they were going anyways, you might as well get it done while you have my help... The other approach was to look up what their future aspirations were. For a lot of them it wasn't to get a full diploma for a lot of them it was 'I just need enough courses to get into whatever trade or whatever work' and so we would just focus on the courses that contributed to that and a lot of times science got picked… it definitely involved a lot less reading and it was a fairly short course that with some concerted effort you could get through pretty quickly.*

Therefore, once the students bought into schooling, their plans for the future determined the courses that they would select. It was made clear to them that at HOPE they had the support they needed if they were to take a harder course. Students' ability to attain credits at HOPE implied that the other strains, which were associated with evaluation, study, and speech were also addressed.

The *personalized approach* to learning at HOPE, the *normalcy* that was fostered there, and the *accountability* that students had, mitigated the effects of strains on evaluation and study. Being able to have a set routine and a structured schedule, made it easier for students to stay on top of their workload. Similarly, living in community with teachers, supported accountability because the educators and staff reminded the students about due dates and offered to help with assignments. Correspondingly, the study guides that were created for the exams alleviated the effects of stressors on evaluation. Referring to the study guide for Science 100, Teacher B remarked, "there was a final exam that covered everything in the whole course… I kind of built like a study guide for it that reviewed everything... If they set themselves up through the study guide, they were going to do well." Thus, recognizing the effects that strains have on studying and the pressures that were connected to evaluation, the staff at HOPE responded accordingly.

Speech was another area that was affected by strains. Students were *triggered* when teachers/staff spoke to them with an authoritative tone or when they felt as if they could not trust what someone was saying. For instance, the student who cheated initially did not trust that it was in his best interest to retake the test, however, after the fact he realized that he should have

trusted the teacher's judgement. The use of *Indigenous inspired practices* at HOPE was a preventative method that addressed issues of communication and fostered trusting relationships. The youth worker described the affects that ceremonial space had on students' demeaner and speech. To clarify the connection between communication and *Indigenous inspired practices*, it helps to revisit the youth worker's explanation, but this time consider that it is not only the youth who are speaking from their hearts or recounting their pasts:

> *So, being able to like be in those ceremonies, and to listen to what the youth would say– the words or encouragement and what they had gone through–and speaking from an authentic and really genuine space, just witnessing that healing process was profound.*

The youth worker shares that she was in those spaces, which meant that she also had to share her experiences, be vulnerable, and accept encouragement from others.

Similarly, the Circle of Courage model supported relationships that were built on trust. Receiving a belonging bead–without having to merit it and irrespective of one's past–was a sign that those who worked at HOPE were not judging the students and that everyone was welcome. In the words of the youth worker this had a comforting effect. She shared:

> *So, when we had youth who are… First Nations a lot of them felt more comfortable because either they were familiar with it… They felt more welcome in that space that part of their culture was being woven into their treatment. Or maybe they hadn't been very connected to that part of their identity, and they were being given the opportunity to learn more.*

Furthermore, when the teachers and staff partook in smudging, they showed that they respected/believed in the benefits of that cultural practice, which affirmed Indigenous students' identities, and showed that they supported who their students are. Particular to smudging, it demonstrated that the adults needed to be purified and so it placed everyone–students, teachers, and staff–on the same level. Sharing these experiences had a humbling effect on the teachers and staff, which fostered mutual respect between them and the youth.

Group *therapy* also helped students to acquire positive *coping mechanisms* to deal with such strains and to support improved communication. In addition, the youth workers liaised between the clients and other parties whenever there were disagreements to ensure that communication was non-violent. The youth worker elaborated on her role as a mediator and the use of the "process called OFNR" through which each party would "express their observations,

their needs, their feelings, and their requests." It was a safeguard to ensure that those involved "were using more compassionate communication." Another goal of mediating discussions was to foster empathy, by helping all sides to "see from another perspective." Thus, students at HOPE learned conflict resolution skills to improve their communication and to prepare them for when they would encounter stressful situations once they left HOPE.

The supports that were in place at HOPE to handle the MESS created by strains, enabled students to have a more positive learning experience. Helping students to resolve conflicts peaceably and respectfully, giving them a sense of normalcy, affirming their cultural identities, teaching them legal coping mechanisms, and setting them up to experience academic success, were major contributors to fighting the strains that they faced. In tandem with the techniques used to alleviate stressors, particular pedagogical approaches made schooling at HOPE as inviting as possible. The following section contains a typography of the three most prevalent pedagogical strategies that were used at HOPE.

A Pedagogy of Relationship: Trust, Transparency, Tough Love, and Teamwork

The value of building positive relationships was integral to life and teaching at HOPE. As one of the documents described, living in community allowed the teachers to be "a friend to the kids." During the interviews, the question: "What pedagogical strategies were used at [HOPE]?" received a consistent reply that building strong student-teacher relationships was the primary pedagogical tool used in all subject areas. Teacher B's response to that question was that "education at [HOPE] was 100% relationship based." Certainly, my experiences during the field observation attest to the unique ways that being in a remote location and not having cellular service was conducive to building relationships with those around me. This reoccurrence and the primacy of relationships at HOPE, necessitate further details on this pedagogy of relationship. The interviewees offered rich explanations of what this entailed and how HOPE generated these bonds. Therefore, the following descriptions are based on interviewee's accounts.

HOPE's pedagogy of relationship had a few key ingredients that produced strong student-teacher relationships. These elements are summarized by the four Ts: trust, transparency, tough love, and teamwork. The first T, trust, pertains to the ability to believe and confide in someone. The second T, transparency, reflects one's capacity to be open and honest about who they are as opposed to putting on a false display. Tough love, the third T, encompasses telling one the hard

truth, maintaining elevated expectations, and not avoiding confrontation. Lastly, the fourth T, teamwork describes assisting each other to reach shared goals and communicating in a positive way. These four Ts were exhibited at HOPE through the unique roles and expectations of teachers and students.

We all would agree that trust is necessary for a healthy relationship, yet, to what degree should students trust their teachers and vice versa? Given the student demographic at HOPE, which consisted of those who had issues with the law and broken relationships with schooling, the need for trust between students and teachers was vital. One of the ways that HOPE supported trust was through a judgement-free space. Teacher A, referring to the educators who were at HOPE, remarked, "we are not the judge." Since students were not judged based on their past, they were able to open up to their teachers about their struggles. "The more trust they had with us, the more honest they would be," he shared. When they confided in teachers about illegal activities such as using drugs, they were not reported because the teachers respected students' confidentiality. Teacher B believed that "getting to know your teachers… are going to go to bat… [for] you" helped students to trust the educators. The more willing students were to share, the more teachers (and counsellors) were able to tailor their programming to the students' needs. Thus, being able to trust each other was a key component of teaching at HOPE.

Transparency from both students and teachers helped with gaining and maintaining trust, while breaking the barricades that were placed by their previous schooling experiences. One of these barriers is the discrepancy between the life experiences of marginalized students and educators. These students felt as if they could not relate to their teachers because the majority of teachers have not been involved with the justice system/have not struggled with addictions/have not been initiated into a gang. At HOPE, being transparent allowed teachers to overcome this disconnect. Instead of relating to each other through identical experiences, educators at HOPE simply tore down the façade that they had perfect lives. Since students at HOPE were with their teachers after instructional time, they witnessed whenever the teachers were down. The director provided this example, "if you have a tough conversation with your partner and then you're going to sit down at the dinner table with your colleagues and your [students], it's really hard for that not to be obvious." She said of a typical nine-to-five context, "you work for eight hours then you go home and so, if you're having a [crummy] day you can hold it together for eight hours– anybody can." The sentiment is clear: One could mask dealing with a difficult personal issue

during regular school hours, but it becomes hard to hide when you live in community with students, as was the case at HOPE. Teacher B remarked, “I think a big part of it was getting to know their teacher, getting to know their teacher is human, getting to live and interact with them both in school and out of school.” Transparency, being vulnerable, and being seen as human made the teachers relatable and fostered a positive student-teacher relationship.

Being able to relate well to students at HOPE was paramount when it came to tough love and the resultant difficult conversations that accompanied it. Whenever teachers recognized that students were not giving their best effort and whenever students had a poor attitude, they were confronted by their teachers. Although this often took the form of constructive criticism, it was not an easy conversation to have. During these discussions, the teachers highlighted the student’s potential, then plainly mentioned areas where more effort was needed and reminded the adolescent of their academic goals. Recounting a tough conversation with an unmotivated student, Teacher B recalled saying:

> *You have an opportunity right now. You’re in treatment. You’re trying to turn your life around. It’s time to take yourself seriously and you know you have a real opportunity here to get as many credits as you possibly want–and I’ll work as hard as you do to get yourself ahead, to get you somewhere where you are going to be successful, but that’s up to you.*

Teacher B said after that conversation the student “turn[ed] the corner” and earned nearly 1/5 of the credits that were needed to graduate. Similarly, the supervisor attributed, “those tougher situations…” as spinning “kid[s] into the right direction…” The supervisor spoke fondly of a student who called back and said, “how grateful he was that there were teachers that were holding him accountable and weren't letting him get away with things that he got away with at his school prior to coming.” This may not seem like anything extraordinary, but it made me wonder how many of these students’ pre-HOPE teachers bothered to have these tough conversations and how many viewed this student population as a lost cause. What was apparent was that whenever previous HOPE students called or emailed to provide an update on how they were doing, they were often grateful for the tough love that they received at HOPE. Students praised this approach for waking them up and similarly, teachers viewed the hard truth conversations as turning points in students’ attitudes and performance.

Teamwork was the last ingredient to fostering strong student-teacher relationships at HOPE and it was also part of the success that students experienced. All of the interviewees mentioned the ways that teamwork helped to grow a community. The youth worker praised HOPE for creating a "great sense of community" and the director explained that living on the site helped to "build that strong community which our clients were a part of." Due to the circumstances related to living in a remote wilderness location, everybody had to pitch in to take care of the site. HOPE did not have custodial staff. As mentioned before, teachers, youth workers, students and supervisors all contributed to making sure the living environments were clean and tidy; cooking meals; and helping with other tasks for the upkeep of the site. This placed everybody on the same level, as the teachers and staff were not above cleaning and doing chores. This also gave them a common goal. Teamwork extended to teaching and rehabilitation as the staff and educators worked together. The teachers made it evident that they were on the students' side, they worked tirelessly to help them earn credits, and they went the extra mile to set students up with the tools that they needed once they left HOPE. Teacher B poignantly shared that "students would come to see that [teachers] were their advocates. We were their cheerleaders. We were there to pick up and support them." Yet, the students were the main players on the team when it came to learning, and whether they involved their teammates was entirely up to them. Those who did well at HOPE had a strong relationship with the team that was at their disposal.

Teachers were able to contribute to teamwork, administer tough love, promote transparency, and build trust with students because of the communal nature of HOPE. Interviewees asserted that HOPE's success in fostering strong student-teacher relationships was attributed to living in a remote camp environment where they were actively involved in their students' lives. Those who were working in other schools at the time of the interviews shared that it was far more challenging to generate these kinds of student-teacher bonds, due to higher student-teacher ratios and limited contact with students outside of instructional time. Similarly, marginalized students—those who would arguably benefit most from positive student-teacher relationships—often have attendance issues, hindering the chances of building those bonds. Thus, HOPE's ability to foster a pedagogy of relationship was intrinsic to place.

Place-Based Science Education: Terrain, Travel, and Tending to the Community at Large

The remote wilderness location of HOPE was ideal for *place-based science education*, the second most prevalent pedagogical strategy used at HOPE. This approach to teaching and learning, which gets students involved in their local community (i.e., both social and environmental) and supports students' activism (Barton & Tan, 2010), is exemplified through the content that was taught and the projects that were conducted at HOPE. For instance, the Science 100 course contained units on biodiversity and environmental education that were addressed through place-based learning; and the larger projects that were part of said course (e.g., the eagle watching project). Referring to science education in particular, the director said that at HOPE it was "land based" and she went on to list the content that was explored, which included "animals… weather, clouds, seasons, rainstorms, birds… trees… grasses… plants [and] rock formations." Overall, there were three distinct categories for the types of place-based science learning that occurred at HOPE–the three Ts: Local Terrain, Travel, and Tending to the Community at Large. Local terrain, the first T, pertains to learning from the land on the HOPE premises. Travel, the next T, refers to educational moments that happened off-site. Lastly, tending to the community at large, included the environmental projects in which the students partook that were part of larger initiatives. Thus, the three Ts started with local learnings, which had a personal effect on the student and then expanded to participation in application projects that had an effect on others (including other living things).

The wilderness environment at the HOPE site intrigued students. Teacher A put it this way, "the questions came in all the time. They were always asking things. Wildlife was a big one for them." The adolescents' natural curiosity and observational skills blossomed as they were exposed to the local surroundings at camp. Providing further details on the affect of wildlife on the students' engagement, the principal said:

> *They used to keep game cam[eras] on around the area. So, they would take pictures of the local animals… The kids would look at those and see the footprints and it was a stepping-stone for science opportunities… There's wildlife there that you would not believe!*

What they learned about the wildlife in that region through game cameras and by being in-tune with their surroundings, enabled them to meet the curricular expectations for their Science 100

credits. In this manner, the local place-based science approach was a hook that capitalized on students' innate inquisitiveness.

Being able to go on trips supported *place-based science learning* in other regions. The principal relayed that the learning continued off-site, "when they left the class, they would go out and would learn about other things… it would reinforce some of that learning." Teacher A agreed and listed some of the trips, including: "hiking… skiing… mountain biking… snowshoeing." Regarding the impromptu teaching that happened, he said, "all that kind of [science] stuff is built in there. Lots of it is learning the skills to do the trips and then how do those skills translate into other areas of schooling." These teachable moments that were not at HOPE sent a message to the students: The wildlife that captivated their attention was not confined to the HOPE site. This was an important lesson as the implications meant that when they completed their three months at HOPE, their curiosity did not have to be quenched. Teacher A described the students as having gone through a process of awakening. He elaborated:

> *They don't necessarily take the time to notice the things that are around them. So, their eyes are open, but they are not paying attention as closely as they should… but once they start to realize that if they keep their eyes open and looking and having a conscious effort… their eyes see those things.*

Being able to "see" the world around them was a skill that the youth acquired from this place-based approach.

Students' interest in the outdoors–which was sparked by the HOPE site and extended to other outdoor regions–enabled them to learn about the environment and to eventually apply what they learned to Tending to the Community at Large. Project bat house, the eagle field study, and the trips to the animal rehabilitation centres allowed the students to not only learn about the wildlife that were in their province, but also to make a difference by helping researchers and taking care of animals. The supervisor recalled some of these occasions:

> *Monitoring elk herds, and things like that. So, there are these really cool events and partnerships that the teachers set up with the… park. We would go and through those partnerships be able to take part in watching eagle migration, we would get to go and help [animal] rehab centres–so there would be cool opportunities to go and do those types of learning.*

Being involved with other organizations allowed the students' understanding of place to go from the local (HOPE site) to the regional (western provinces). Yet, aside from the content knowledge, the students had an opportunity to serve others, help those in need, and to do something beneficial for the larger community. Given their strained backgrounds, it is likely that they would not have had those experiences if it were not for HOPE.

Place-based science education was utilized at HOPE to connect students' interests to the content that they were required to learn. However, the use of place-based learning did much more than help students to get a good grade or motivate them to complete a course. Starting with the local terrain and traveling outwards, students were engaged with their surroundings. That is, *place-based science* helped the youth to open their eyes to what was happening around them. This pedagogical approach positioned them in such a way that they could aid those in need. The students at HOPE assisted researchers who were studying animal migration (e.g., elk, eagles, and other birds) and they tended to animals that were unwell. Consequently, place-based learning empowered the students to utilize their talents and apply their learnings to make a difference.

Personalized Education: Target, Task, Timelines, and Transition Plan

Place-based science and a pedagogy of *relationship* were accompanied by an individualized approach to education for every learner who attended HOPE. Due to the different intake times when students joined HOPE, the varying educational backgrounds of the students (i.e., grades, credits earned prior to HOPE and while at HOPE), and the range of strains that affected their learning (e.g., cognitive abilities, trauma, *learning disabilities*), a *personalized education* was most suitable. Explaining the rationale for a personalized approach, Teacher A said, "It was very self-directed because we didn't know how many kids we would have on any given day and they were all different ages, different grades" The low student-teacher ratios were essential for this kind of schooling because understanding the needs of each student required focused attention on each individual. In the words of Teacher B, "[students] had the undivided attention of a teacher." Getting to know the needs of the students extended beyond school as the youth worker commented that the teachers were:

> *Integrated in the process. They came to all of our client meetings, where we would sit with different therapists and all of the support team… So, the teachers got to be part of that process and they got to be part of that training and so I think… it was valuable.*

At HOPE education was personalized in regard to four key areas: target, task, time, and transition plan because–as the interviewees made clear and as the supervisor succinctly said–"you couldn't have a one size fits all. It had to be completely customizable to th[e] student." Since every student had different long-term goals, their targets–the credits they required and their learning goals–were personalized. Similarly, tasks, which refers to the specific assignments, jobs, and roles that each student had, were personalized to meet their varying abilities. In turn, the timeline or duration that it took a student to accomplish a task or earn a credit was also unique. Lastly, the transition plan for each learner as they left HOPE and returned to their home communities was catered to their individual needs. By personalizing the adolescents' target, task, time, and transition plans to their needs, education at HOPE was entirely student-centered.

Recognizing students' long-term goals and helping them to map out a plan to meet those goals was part of the way that HOPE helped students to target their education. Not all of the students required a full diploma to get into the training program that they wanted or to get the job that they preferred, and for that reason students were free to select the courses that they needed based on their desired outcomes. Teacher B explained that they would: "look up what their future aspirations were… and… just focus on the courses that contributed to that and a lot of times science got picked." Another part of meeting their goals was that they could, "take courses that they weren't very good [at learning]." Therefore, the students determined what their goals were and how they planned on working towards those targets while they were at HOPE.

The tools that were used to help students learn and the other opportunities that they had to demonstrate their learning were personalized to each youth. Giving students the ability to navigate their education and presenting them with "a lot of choice" was an effective practice that the youth worker praised. Similarly, the principal mentioned that being able to adapt and "revise [tasks] to meet the needs of the young person" was beneficial. The types of content varied from video projects, short response assignments, paper labs, to field study investigations. Teacher B recounted that "there were a lot of people who liked the field study… getting out on the land, [and] being able to try to connect with some of the things that they were studying." The supervisor had fond memories of a fun project in which he said a student took "game camera footage and… create[d]… like the whole government of Canada nature videos… It had that vibe." He said, "she did it all on coyotes, all using footage from around camp, and narrated it." The videos reminded him "of things from [his] childhood, where you flip on tv and [see] these

little nature spots." The enjoyment that the student had with the video project was contagious, and referring to the playful nature of the project, the supervisor recalled that "just from that video [they] would do the music around the dinner table" and have a fun time. Thus, being able to customize students' tasks to their interests and needs, made learning more enjoyable for all.

At HOPE there was an awareness that time pressure was a stressor for the youth, which could drain students' joy in learning. As a result, the expectations pertaining to timelines were modified to suit the needs of the learner. The youth worker summarized the HOPE approach as, "being more like do at your own pace and receive support from the teacher." Correspondingly, Teacher A explained that the tasks were designed so that students "could complete them at their own pace." The importance of not requiring students to learn content at the same rate and not expecting them to complete tasks at the same pace was a vital part of HOPE. The principal highlighted that integral to learners going at their own tempo, was that "the instructions themselves would be one-on-one. There would be very little opportunity in the class to stand and deliver to a group of kids." One benefit was that this alleviated the stress of having to keep up with others if one were to fall behind. The other benefit was that if one were ready to move on to something else, they did not have to wait on the group. Therefore, the pacing of assignments, evaluations, and transitions were all personalized to each learner.

Once a student was nearing the end of their three-month stay at HOPE, the teachers worked with them on their unique transition plan. Referring to students' autonomy in planning their next steps, the director noted, "there was an individual kind of ability for the kids to determine what their needs were." Their plan contained pragmatic actionable items that the youth could do in their home community. The scope of the transition plan depended on the student, but usually pertained to schooling, finding a job, accessing community supports (groups, safe places, volunteering), and locating green spaces. In describing his role to set the student up for success after HOPE, Teacher B outlined aspects of the transition plan: "I'm fighting tirelessly to get them another placement, or get them another chance at a school, or get them into a program, or get them credits that they deserve." Explaining how he helped students to access green spaces, Teacher A shared that they:

> *Would pull up Google Maps and… show them. You know what, there are green spaces in most cities. So, how do you access them? Can you ride your bike there? Can you walk*

> *there? Can you catch a ride with your parents? So, you get the same benefits of being outside even if it's an urban park.*

Overall, Teacher B said the plan was about "getting to know what resources were in their community for them to go back to that might be successful [rather] than what they had experienced before."

The personalized approach to education at HOPE was all about helping the youth to succeed. By giving each student one-on-one attention, teachers were able to glean students' interests, understand their academic struggles, learn about the stressors in their lives, and work with them to reach their goals. The assignments, projects, and evaluations were designed to enable the learner to express their understanding and apply their knowledge in ways that were meaningful to them (e.g., via an informative video as opposed to a science report). The timelines for tasks and pacing towards earning credits were also determined by the adolescents' preferences. Additionally, students had autonomy when creating their transition plans. Therefore, by personalizing the students' targets, tasks, timelines, and transition plans, HOPE was setting them up to experience success.

Summary of the Major Findings

This chapter explicated the MESS that strains posed for education–in the areas of motivation, evaluation, study, and speech–the strategic methods that addressed the MESS, and the predominant pedagogical approaches that were used at the HOPE school. Any academic success that students achieved at HOPE could not have been possible without using Indigenous inspired practices–and other therapeutic techniques–to address stressors and to support healing be it physical, mental, emotional, spiritual, and/or relational. The specific pedagogical approaches that were intrinsic to academic success at HOPE were: a *pedagogy of relationship* that was built on trust, transparency, tough love, and teamwork; *place-based science* education, which entailed local learnings, trips, and tending to the community; and *personalized education*, which involved individualizing targets, tasks, timelines, and transition plans. Therefore, the combination of certain pedagogical approaches with deliberate therapeutic interventions, mitigated strains and created an ambiance where learning could occur.

Based on these findings, HOPE was distinct in their approach to wellness. Contrasted against urban programs, where youth attend for a set time of the day, what HOPE offered was

around the clock rehabilitation. The clients–being removed from stressors (such as access to drugs), in a place where healthy relationships could be fostered, and where cultural beliefs were supported–were provided what they needed to grow. Moreover, considering treatment and education in tandem (which was a consequence of the teamwork between teachers and staff) made all who worked at the HOPE site better informed on the needs of the adolescents, which gave them a stronger position for meeting those needs.

Chapter 7: Discussion and Conclusion

In this chapter I discuss the major findings in light of the propositions of this case, which are taken from General Strain Theory and the school-to-prison pipeline discourses. The findings are situated within the literature on justice services in Canada—including education and rehabilitation. First, I begin with a discussion on strains and mitigating strains. Next, I revisit the discrepancy I found that pertains to the different phases of this study—i.e., the silence versus the vocality on the use of *Indigenous inspired practices*. After outlining the significance of said practices, I turn my attention to the pedagogical approaches that were employed and the successful Science 100 course. Next, I provide recommendations for HOPE, as they seek new partnerships, in light of what was learned from their ability to recognize and mitigate strains. Lastly, I reflect on the research journey. Hence, I begin with a discussion on strains.

HOPE's students had experienced a variety of strains—including educational stressors—that interacted in complex ways. The findings from this study indicate an intertwined nature of strains. In particular the strain of *addictions* is connected to educational strains (e.g., being removed from school for the possession of an illicit substance). Furthermore, I found that certain events may have a short-term effect of causing strains but a long-term effect of mitigating strains, such as being confronted about cheating. In one example, the confrontation sparked a short-term outburst and dangerous behaviour from the student, who later expressed gratitude for being held accountable. That student went on to attribute accountability as being vital for his subsequent academic success. Due to the complex circumstances that strains presented, HOPE's ability to recognize stressors and strategically target them through preventative and reactionary measures, underpinned their efficacy with this youth demographic.

The fact that HOPE's clientele had experienced the strain of having *dropped out of school* or being disengaged with schooling, indicates that they had a sense of academic futility– the belief that one will never excel academically. Academic futility is a particular strain that has been linked to delinquent behaviour for students who do poorly in school and are placed in lower tracks (Van Houtte & Stevens, 2008). While doing poorly in school can be a result of a number of reasons (e.g., truancy), this study pertained to students who operated below grade level (Van Houtte & Stevens, 2008). Considering that HOPE's youth had been "out of school for two years" and "they were way behind," makes academic futility plausible. However, additional findings

from this study suggest that there may be another aspect of academic futility. I posit that a practical motivation can underlie academic futility, which was exemplified by youth who already had an occupation in place or planned to work in a position that did not require further schooling. Combined with negative experiences of schooling and possible learning difficulties, the feeling that schooling is not needed to advance towards employment, may fuel the belief that one will never excel academically and influence a lack of engagement in one's for-credit education.

Disengagement from schooling was also viewed by HOPE's staff and teachers as being driven through tyrannical power dynamics between teachers and students. Such power dynamics—in which teachers control all aspects of the course and students are subjugated to the rules—were a *trigger* for HOPE's students. This affirmed Conrad's (2014) findings that heavily rule-bound spaces confined one's ability to learn and grow. This evoked epistemological questions and subsequent pragmatic questions: What is the teacher's role? Is the teacher an authoritarian, expert, instructor, facilitator, mentor, coach, etc.? What are the effects of that role on students' learning? Does that role differ depending on the composition of the student body (i.e., who the students are)? Does that role vary depending on where learning occurs (i.e., in a secure care facility, treatment facility, public school, private school, etc.)? The director was mindful of these power dynamics as she stated, "there is a power differential… How do you recognize that and how do you try to neutralize it or how do you conversely use it appropriately?" The quote alludes to the responsibility that one in a position of power holds and to the various ways that power is handled in relation to particular circumstances.

In accordance with the view that situations determine the manner in which power is utilized, the role of HOPE's teachers was never fixed—i.e., it fluctuated between authoritarian, facilitator, mentor, etc. For instance, teachers enforced the rules when students were caught cheating. However, schooling was not regimented by the educators because students had autonomy in choosing courses, determining assignments, and setting deadlines. Particular to the Science 100 course, the teacher was a facilitator who guided the students' learning with *inquiry-based* assignments and prompts that furthered students' thinking. The teachers' understanding of how to relate to students in different situations stemmed from their awareness of the power dynamics that were at play, which in part was a combination of the training that they received on the right use of power and their many years of working with this particular student demographic. Underpinning their handling of power was a firm commitment to building strong student-teacher

relationships as this was seen as foundational to students' success. Provided that poor student-teacher relationships are a significant strain (Agnew, 2009), it follows that triggering power dynamics abet this strain, while positive student-teacher relationships alleviate this strain.

Another educational *trigger*, testing, may be better explained through its connection to the students' other strains–including *mental health issues*, *cognitive disabilities*, and *addictions.* These strains are not only recognized within GST, but also are well documented in criminology. Particularly, in biopsychological criminology *mental health issues, cognitive disabilities,* and *addictions* are found to be more pronounced within delinquent populations (Houchins et al., 2009; Moffitt, 1990). Therefore, the strains that inhibited HOPE's youth from doing/coping well with tests are not unique but are representative of those involved in the justice system. Although this explains why testing and time pressure were *triggers*, there were other potential catalysts.

The school-to-prison pipeline metaphor—which was first devised and applied to education in the United States—proffers additional perspectives on these strains and their affects on the academic performance of HOPE's clientele. The building blocks of the pipeline coincide with the educational *triggers* that are identified in this study, particularly those that apply to student-teacher power dynamics and students having trouble following rules: Abuse of power dynamics within school settings factor into making schools more like a prison, and thereby produce uneasiness within students who feel targeted, which causes an emotional response (i.e., being *triggered*) (Nocella et al., 2014). Therefore, schools that are overregulated and have an authoritarian climate—similar to detention centres—are of grave concern within the school-to-prison pipeline.

In his comparison of teaching in a hard-to-staff school and working in a correctional facility, Sipe (2012) identifies the following parallels between the two institutions: an over emphasis on control, without the slightest room for minor infractions; an adversarial "us versus them" attitude between those in authoritative positions (i.e., officers and teachers) and those in subjugated positions (i.e., inmates and students); an ambiance of stress; and a track record of failure as the "correctional" facility and "educational" institution were neither correcting nor educating. These similarities go beyond making learning difficult, to acclimating students for detention within school, or grooming them for detention when they are pushed out of school (Heitzeg, 2014). This description coincides with the unanimous finding from the interview phase that HOPE's youth had negative educational experiences prior to attending HOPE.

These experiences and the other strains that the youth faced led to many of them dropping out of school entirely, which within the school-to-prison pipeline discourses is reconceptualized from "dropping out" to "being pushed out" of school. Proponents believe that detrimental policies, adversarial "us vs them" school cultures, and prison-like physical infrastructure amalgamate to cause this phenomenon. Specifically, the pipeline is comprised of the implementation of zero tolerance policies, an increase in the presence and action of police officers in schools/authoritarian figures, an increased incentivization to exclude students who are lower performing or deemed troublesome, and an overall rise in the similarities between schools and prisons (Bahena et al., 2012). All of these factors combine to force students out through expulsions or push them out via discomfort (Bahena et al., 2012).

Seth Cooper (2012) describes his experiences of being pushed out of school. He was singled out in high school (which he attended for one month) because of an accusation that he smelled like burnt marijuana. After being wrongfully accused, with no chance to defend himself, Seth never returned. He realized that he was not welcomed in school and his attempts to belong were futile (Cooper, 2012). Mr. Cooper is just one example of a student being wrongfully denied schooling. There is growing evidence that suspensions and expulsions have been administered in situations where they are unwarranted and that students racialized as White are less likely to be expelled for the same offenses that caused their peers to be pushed out of school (Losen, 2012). Although the rationale for why the majority of HOPE youth had stopped attending their community schools was beyond the scope of this research, pipeline discourses offer insight and plausible connections that address the educational pitfalls that were found in this study, as well as the methods for mitigating those problems.

The way that the HOPE staff and teachers adapted to the strains and shortcomings of traditional education, is connected to recommendations to dismantle the school-to-prison pipeline and empirical research on mitigating strains. The first response to alleviate educational stressors in the HOPE school was to welcome students through the use of the Circle of Courage model. Students were explicitly told and symbolically shown that they belonged by being given a belonging bead. Compared to Seth Cooper's experience, where within the first month of high school he felt he did not belong, these students were given a gift (i.e., the bead and bracelet) upon arrival, which was a tangible reminder that they were welcomed at HOPE. They learned that their wellness mattered through the individualized approach in which rehabilitation and

education were considered in tandem. To evade academic futility, the teachers increased students' motivation by helping them to attain credits (Science 100 was paramount to this effort), which Teacher B said gave them a sense of "immediate gratification." The ability to earn credits was made possible by providing them with the individual supports that they needed (e.g., study guides, *coping mechanism*, *personalized approach* etc.). Overall, the teachers expressed that a taste of success in school was a major incentive for HOPE's students continuing their education.

However, educational triggers needed to be addressed to ensure that the learning environment was positive because negative emotionality—caused by being triggered—is not merely a disturbance to others but is a significant stressor. Drapela (2006) states, "anger is the most critical of negative emotions in GST because it increases the level of injury and/or desire for revenge, creating pressures for corrective action relieved by delinquency" (p. 756). Therefore, reducing triggers that lead to anger and providing one with coping mechanisms can reduce this stressor. HOPE's holistic approach to education was integral to students' success and alleviating negative emotions. This approach involved supplying students with various forms of therapeutic experiences such as *Indigenous inspired practices*, counselling, *adventure therapy*, etc., which enabled HOPE to empower their students to take an active role in their treatment, deescalate conflicts, and assuage said strains.

The use of *Indigenous inspired practices* was a consistent part of HOPE's programming, which had positive effects, however there were inconsistencies in the documentation of its presence. Prior to explicating the benefits of these practices with respect to strains and mitigating strains, I discuss the discrepancy between data sources. Throughout the document analysis phase, there was no explicit mention of these practices. Evidence was seen in the video and Facebook album, however there was no direct reference to them. In the promotional documents that were analyzed, there was zero mention of *Indigenous inspired practices*. Instead, the discourses in those advertisements mainly pertained to *wilderness adventure therapy* and minimally addressed schooling. According to Stuart Hall (2020):

> A discourse is a group of statements which provide a language for talking about—i.e., a way of representing—a particular kind of knowledge about a topic. When statements about a topic are made within a particular discourse, the discourse makes it possible to construct the topic in a certain way. It also limits the other ways in which the topic can be constructed. (p. 155)

Therefore, through the repeated construction of HOPE as a *wilderness adventure therapy* site, the use of *Indigenous inspired practices* was veiled and seemingly non-existent to a lay reader of that material. However, to someone who is familiar with Canada's approach to wilderness adventure therapy, it may have been implied that HOPE used *Indigenous inspired practices* because in the Canadian context such practices are commonly utilized. Considering these documents were directed at the general public to promote fundraisers or as information pieces (e.g., the longer articles and videos), the constructions were geared at presenting HOPE such that as many people as possible would understand what they did and support the cause. Although HOPE believed in the benefits of *Indigenous inspired practices* (e.g., smudging), they were less certain about their role in providing those services. The director expressed a tension HOPE felt in the following quote, "[W]e recognize that as a non-Indigenous community our role is not to be running programs for Indigenous people… What is our role?" With such uncertainty, it is expected that details on the *Indigenous inspired practices* were not paraded, due to the sensitivity of the issue.

Further complicating the discussion on *Indigenous inspired practices* was that only two interviewees referred to them–the youth worker and the director. It was clear that they esteemed the integration of Indigenous culture at HOPE. It was also apparent that the Circle of Courage model was a regular component of their programming—regardless of if students identified as Indigenous. They alluded to the fact that the *Indigenous inspired practices* were connected to treatment, rather than for-credit schooling. The youth worker described it as follows:

> *I think the place itself–the land itself–is very special and also the way the program was structured. The ceremony and the Circle of Courage was like an underlying principle of the treatment process. It was really quite beautiful to witness, and it created this great sense of community for a lot of the youth.*

The notion that the *Indigenous inspired practices* were part of treatment, may explain why the teachers and principal did not refer to them. Even though they were educational experiences, they were not schooling experiences. Dewey (1916) explicates the differences between schooling and education, while highlighting the pros and cons of each, in the following:

> We are thus led to distinguish, within the broad educational process which we have been so far considering, a more formal kind of education—that of direct tuition or schooling…

> Intentional agencies—schools—and explicit material—studies—are devised. The task of teaching certain things is delegated to a special group of persons… But there are conspicuous dangers attendant upon the transition from indirect to formal education. Sharing in actual pursuit, whether directly or vicariously in play, is at least personal and vital. These qualities compensate, in some measure, for the narrowness of available opportunities. Formal instruction, on the contrary, easily becomes remote and dead—abstract and bookish, to use the ordinary words of depreciation. (pp. 8–9)

Based on this description, for-credit curricular content that was taught at HOPE by certified teachers qualifies as schooling. Whereas, the informal teachings that were part of the Circle of Courage model, the additional spiritual practices (e.g., smudging), and the training via actual experience, are considered parts of the broader educational experience. However, these categorizations can overlap, as the youth worker raised the point that the Circle of Courage model should be integrated in schooling. Expressing these thoughts, she said:

> *It [i.e., the Circle of Courage] would be pivotal during that middle school age. I could definitely see it being incorporated—going through the Circle of Courage—because it was developed to work with at-risk youth to create resiliency… I think it would be beautiful and I think it was so empowering to our First Nations youth to connect with their culture.*

Indeed, the Circle of Courage model has already been successfully used in schools in Canada (see Aikenhead, 2014, p. 65). Although at HOPE it seemed to be used mostly in the sphere of treatment, *Indigenous inspired practices*—by fostering community—indirectly benefitted the learning that took place in school.

The Circle of Courage and ceremonies that occurred at HOPE were used for their therapeutic benefits, spiritual/cultural relevance, and ability to nurture positive relationships. Although there are few tests of General Strain Theory with Indigenous populations, an American study found that religiosity mitigated strains connected to the use of an illegal substance. Moreover, when other indicators (e.g., parental support) crumbled against peer pressure, spiritual beliefs remained an indicator that one would not use an illicit substance (Eitle et al., 2013). These findings are incredibly pertinent to the treatment of youth and Indigenous adolescents in particular, especially when considering the provincial health service provider was firmly against the use of spiritual practices at HOPE. By not conceding to the funder's request, HOPE sent a

clear message that the use of smudging, sweat lodges, and ceremonies were just as valuable as the approved forms of treatments (e.g., counselling, wilderness adventure therapy, etc.). Moreover, HOPE's unilateral decision to continue the use of said practices—with the guidance of an Elder—showed that they would not comply with the oppression of *Indigenous inspired practices* and indicated that efforts were made to respect the integrity of those practices.

The respect for the clientele and their culture has led the director and those who are considering the next steps for the HOPE site to problematize their presence. As an organization that predominantly consists of those racialized as White and that offers services to those who are mainly First Nations and Métis, the umbrella organization is cognizant of a need to decolonize their practices. The following excerpt from the interview with the director highlights the tensions that are at play:

> *But even as we are progressing through… What is our role? Our role is not—do we just need to provide a space and turn our site over to another organization who can be doing this—who is Indigenous? What is our role in supporting something and then getting out of the way? We don't have all the answers. We don't know… we are working with [a] lead who is Indigenous around what focus we could make... So, we are following her lead, her guidance on this, and we don't have all the answers on that. We are not an Indigenous organization. We at this point could not become one. I don't even know how you could become one… I don't even know if we can do that… even as I say that I'm thinking is that even accurate language and so I apologize if I am saying something wrong.*

In this quote, there is a concern from the director pertaining to the frontline workers, leadership, and language that is utilized. The quote suggests that the mere presence of bodies that are racialized as White (as frontline workers) poses an obstacle to the umbrella organization's aspirations for how the site should be used. It is clear that they desire to promote Indigenous programming for youth by providing access to the site and offering supplemental support. However, the director believes such programming should be led by those who are Indigenous, meaning that the umbrella organization would relinquish their say over how the site is used—unless asked for advice.

This is particularly interesting because the majority of those who worked at HOPE would have been racialized as White, and the findings of this study suggest that they were able to

support their clients on their rehabilitative journey. One wonders: how did the clients feel about having staff/teachers who are racialized as White at HOPE? How did that affect their journey? Similarly, how did the director—who had worked at HOPE for 20 years in various capacities—come to a point of stating that it is not for those who are racialized as White to lead and offer programming to those who are Indigenous? The answers to these questions are wanting. Yet, the director's humble admission that they do not have all the answers is indicative that she is on a self-reflective process. Furthermore, the director's care for the language that she used epitomizes the consideration that those at HOPE made for the cultural backgrounds of their students, and the esteem that they had for their beliefs.

HOPE's regard for the cultures of their students is connected to the three main pedagogical approaches they employed—which include a *pedagogy of relationship*, *place-based science education*, and *personalized education*. The interviewees held unanimous views that HOPE's success was rooted in positive relationships. Furthermore, healthy relationships are central to alleviating strains and especially pertinent to educational stressors. This is apparent in that teacher support and perceived fairness were found to mitigate strains (James et al., 2015). When students perceive their teachers to be unfair, they develop distrust for them and eventually a wariness of educational systems. HOPE's educators and staff recognized that many of their students had said feelings towards education. Therefore, fostering strong relationships was key to overcoming the distrust that students carried towards schooling, and it was foundational to supporting students' needs.

Strong student-teacher relationships were not only built on trust, but also required transparency, tough love, and teamwork. It was more than evident that HOPE's teachers had a genuine care for their students. Investing "in that little relationship bank account" was paramount at HOPE because as Teacher B said, "when [students] feel support… and when they feel cared for, you create an environment where someone can actually learn." The significance of care at HOPE coincides with Wright's (2004) findings that teachers in carceral settings who cared about their students were able to gain their trust and promote an "environment… conducive to creativity and personal growth" (p. 196). Along with caring for the HOPE youth, it was clear that the educators held to a conviction that the work they were doing was instrumental in changing lives. Teacher B expressed, "I felt like we could affect the most change from education in the shortest period of time." Therefore, there was a deep commitment to building positive

relationships with students as the educators were convinced in their ability to empower HOPE's youth.

Correspondingly, the dedication of the teachers to the academic and rehabilitative success of the youth was apparent in the personalized approach to education that was offered. Everything from the students' targets, tasks, timelines, and transition plans were catered to the individual learner. This method made the most of the supports that learners had at HOPE—specifically the low student-teacher ratio—because it maximized the amount of attention that was given to each adolescent. Similar to HOPE, low-student teacher ratios are a common feature in alternative schools. Less populous alternative school classes—which contain approximately 15 students—enable the educators to better address the academic needs of their students and it also helps to strengthen student-teacher relationships (Bascia & Maton, 2017). HOPE's *personalized education* was informed by each student's desires. This aided students' experiences of being treated in a fair manner because of the autonomy they had over decisions pertaining to their education. Moreover, HOPE's individualized approach to schooling—by giving those who had been ostracized by education a voice in their academics—gave them a greater incentive to engage in their learning.

Similarly, *place-based science* approaches enabled the adolescents to learn in ways that were meaningful to them and in spaces that were also therapeutic. HOPE's youth had the opportunity to participate in problem solving and citizen science projects within their local communities (e.g., project bat house) and on trips (e.g., collecting data on eagle migration). Intrinsic to these methods was a sense that learning was not confined to a physical school building and that it could happen anywhere. In addition, the use of *place-based science* capitalized on students' natural curiosity, which was piqued by HOPE's unique remote wilderness location. Teacher A expressed that "the questions came in all the time. They were always asking things. Wildlife was the big one for them." Further support of students was enhanced by place because they lived in a remote community with their teachers, such that the teachers were easy to access outside of school hours whenever a student needed help. In sum, place-based approaches reaped the benefits of academic engagement, fostered community building, and supported ongoing learning.

In light of the school-to-prison pipeline phenomenon, HOPE's pedagogical strategies and other interventions played a role in dismantling the pipeline. Associations between the

architectural design/content of schools with the physical structure of prisons was non-existent at HOPE. The interior of the school—which was like a science museum—and the wilderness surroundings, counteracted the prison-like design and arrangement of traditional schools that are full of concrete, have a cement yard, and are enclosed with a fence. Although students were supervised constantly—which is similar to the surveillance that occurs in schools and detention settings—they were given opportunities when they could be alone. The solo, which was part of their therapy, involved being alone in the wilderness for an extended period of time, in order to reflect. Therefore, students were entrusted with the freedom to be alone at certain times, which is something that is unlikely to occur in traditional schools as students are always monitored by adults or cameras when on the premises.

Furthermore, through the care that was shown for their students, HOPE created an ambiance where authoritarianism was diminished. Reduced class sizes, *personalizing education*, and building a pedagogy of *relationship*, invited HOPE's students to be themselves, to be known, and to feel welcomed. The uniformity that may be found within traditional schooling, such as every student doing the same assignment, was contrasted with a *personalized* approach at HOPE. Although monotony in schools cannot equate to the mundane uniformity that is present within carceral settings, it certainly does not serve to foster students' sense of self: That is a student can be a number in a large class, just as an inmate can be a number in a cellblock. Consequently, the autonomy that students experienced in choosing what and how they wanted to learn and the *relationships* that were integral to schooling at HOPE, created an environment where rules were present (e.g., no drugs), but legalism was not stifling

Altogether*, relationship-based pedagogy*, *place-based science education*, and *personalized education* enabled students to enjoy learning, to attain credits and to get a taste of academic achievement: In particular, the Science 100 course was frequently taken by students at HOPE who experienced success in it. Describing this course, the science teacher remarked: "Science [100] was probably one of our most popular courses." Typically, science courses are known for presenting difficult and abstract content (Millar, 1991); having gendered disparities (Sadler et al., 2012); and being culturally irrelevant (Emdin, 2010a). This would imply that science courses present educational stressors that would intimidate and frustrate students—especially those who have been disengaged from schooling for a significant period of time.

However, the interviewees shared that students at HOPE enjoyed learning science. Referring to Science 100, Teacher B explained that "it definitely involved a lot less reading and it was a fairly short course that with some concerted effort you could get through pretty quickly." At an initial glance this statement may make it seem as if the course required less thinking because students could complete it while they were at HOPE, however the underlying assumption of that view is that less reading equates to less thinking. On the contrary, tasks that require reading and following/regurgitating information do not develop students' scientific inquiry processes (Chu & Fung, 2020). Whereas the activities and projects that HOPE's students participated in (e.g., project bat house, game cameras, who dunits, and field studies) enabled students to problem solve, re-evaluate their thinking, and adapt accordingly. This coincides with what Chu and Fung (2020) refer to as "minds-on activities… instead of mindlessly following a set of instructions laid out in a recipe" (p. 806). Consequently, the educational stressors that were linked to literacy struggles were circumvented through creative *place-based science education* and *hands-on* approaches that also enabled students to engage in higher level thinking.

However, similar to other courses that are available to youth involved with the justice system, it was not feasible to conduct laboratory experiments. Teacher B specified that particularly, "the chem[istry] labs and stuff like that… weren't allowed... A lot of the time it was too dangerous." Due to the strained nature of the class, on-paper mock labs were used. Even though on-paper labs were not ideal, they met the curricular expectations. In addition, Science 100 required an exam, which was far from idyllic. It was well-known that testing was a trigger to students at HOPE because it was associated with negative emotionality (e.g., outbursts). In light of this, HOPE used methods to mitigate said strains. According to Teacher B, the capacity for students to pass the examination, hinged on if "they set themselves up through the study guide." Therefore, despite the triggers that testing presented, the elimination of evaluations was not warranted. Rather, the use of accommodations and coping mechanisms (e.g., NVCs and OFNR) alleviated stressors that were associated with these forms of evaluation; and facilitated the use of tests on intake and as finals.

Overall, the strains and challenges that HOPE's clientele experienced have been well-documented in General Strain Theory and identified within the school-to-prison pipeline discourses. The collective ability of teachers and staff to recognize strains from an educational and rehabilitative perspective, enabled HOPE to create strategic interventions that anticipated

and targeted those strains. The *Indigenous inspired practices*, coping mechanisms, pedagogical strategies and educational accommodations that were utilized, combined to foster learning. A pedagogy of *relationship*, *place-based science education*, and *personalized education* were integral to supporting students and fostering their academic success such that HOPE created a space where learning did not equate to eagerly awaiting the clock to tik to the end of the lesson—as if one were serving a sentence—but entailed authentic intrigue specifically for their surroundings. Thus, being on the land—coupled with living in community—underlined every aspect of the Healing Outdoor Program and Education. Furthermore, the holistic approach to students' wellness, which addressed their physical, mental, emotional, and spiritual needs was influential in HOPE's success.

Conclusion

Educational programs are an integral part of the rehabilitation of youth who are involved in the justice system. Indeed, there is a positive correlation between the number of educational achievements inmates earned, and improved release outcomes (Correctional Service of Canada, 2015). In spite of the significance of this connection, literature is lacking on the for-credit experiences of adolescents who are involved in the justice system. In particular, the for-credit science programming that is afforded to these youth has limited documentation. It is apparent that a lack of facilities and safety restrictions are barriers to learning for this demographic (see Houchins et al., 2009). Considering that across Canada science is a required course for graduation (Tippett & Milford, 2019b) and that educational feats are instrumental in rehabilitation; delinquent youth should have the opportunity to earn mandatory science credits while they are in secure care settings and/or in treatment, regardless of the known challenges to learning in such environments.

This case study explored the Healing Outdoor Program and Education, which was a holistic treatment program for boys and girls aged 12–17 who were involved in the justice system. The site was operational from 2005 until funding was lost and they closed in 2020. Located in a remote wilderness region in a western province of Canada, HOPE offered: wilderness adventure therapy; Indigenous teachings/therapeutic practices; and schooling for academic credit. Of particular interest is that HOPE successfully offered science courses, in which students were able to earn credits.

General Strain Theory and discourses from the school-to-prison pipeline were utilized in the conceptual framework of this exploration. General Strain Theory posits that one is pressured into crime through a number of life stressors that they encounter, such as being unable to attain an education; and the school-to-prison pipeline phenomena proffers that schools are complicit in pushing students out/grooming students for incarceration via harsh policies, the presence of law enforcement officers, and an unwelcoming environment (i.e., via policy, infrastructure, and culture). Merged, GST and the school-to-prison pipeline identify schools as a site for strains. However, empirical tests of GST have also found that schools can mitigate strains. Drawing on this dynamic, I created a conceptual framework in which an inverse relationship is present between strains and engagement in learning: An increase in strains, decreases one's ability to learn, while an increase in engagement can decrease stressors. The role of pedagogy becomes crucial in this framework as it can positively or negatively affect strains and engagement.

Applying the conceptual framework to HOPE, my exploration sought to answer the following research questions: According to staff/educators and documents, what specific strains/stressors did students at HOPE face? From the perspective of staff/educators, what challenges—if any—did these strains/stressors pose to the education they offered to young offenders? As reported by staff/educators and documents, what pedagogical strategies were used to engage this student population in learning science? What was the rationale for these strategies? Lastly, according to staff/educators, did these strategies exacerbate or mitigate strains?

In order to answer these questions, the case study was comprised of three phases. Each phase built upon the previous one to provide greater contextual understandings of HOPE and richer responses to the research questions. The first phase involved document analysis, in which the following documents were analyzed: the official website of the umbrella organization, news ads and articles, promotional videos, and a Facebook page, which was primarily on the science education that occurred at HOPE. The second phase of the study was the interview phase. The teachers, principal, supervisor, a youth worker, and the director were key informants in this part of the study. Their differing roles provided a unique vantage point on HOPE and particularly the science education that occurred. The final phase of the study was a field observation where I traveled to the HOPE site to experience how it was used. The findings from each phase of the

study were first considered in isolation and then after all phases were completed, the findings from the three phases were compared and triangulated.

The major finding was that HOPE was not only able to offer science education to strained youth but also able to use science as a catalyst to reengage said adolescents in schooling. This was achieved by recognizing the strains that students at HOPE encountered—which were primarily addictions and educational strains (e.g., dropping out of school)—and using therapeutic practices (e.g., *Indigenous inspired practices*, non-violent communication techniques, etc.) to address those strains. However, HOPE itself was not strain-free and there were some elements of its programming that were stressors (e.g., testing). The holistic approach to treatment in which one's physical, mental, emotional, spiritual, and social well-being were considered, was key to lessening these strains. In particular, the Circle of Courage model—which underpinned every aspect of HOPE's work including schooling—and the other *Indigenous inspired practices* were critical to HOPE's ability to empower their youth, and specifically those who were First Nations.

Coupled with these efforts, the academic success that learners experienced was attributed to three pedagogical approaches: a pedagogy of *relationship*, *place-based science* education, and a *personalized education*. Having strong student-teacher *relationships* that were built on trust, transparency, tough love and teamwork made students feel welcomed and cared for at HOPE. *Place-based science* approaches piqued students' interest in their remote wilderness location/wildlife and revitalized their enthusiasm and motivation for learning. Lastly, the *personalized* approach to education gave students autonomy in their academic path and helped them to pursue the path that interested them. Altogether, HOPE provided strained youth with a transformational experience where they were supported on their rehabilitative journey and able to accomplish a number of feats (including earning credits).

These findings not only add to the literature, in which little is known about the for-credit experiences of youth involved in the justice system; but also point to the way that science can be safely implemented within a treatment facility school and settings with similar clientele through *place-based* approaches. Moreover, the findings exemplify that science can be a catalyst for reengaging students rather than a detriment to their learning when teachers are provided with the right supports. The outcomes of the strategies that were utilized should not go unnoticed. The strained student population—one known to experience inequities in access to science

education—went from being disengaged in school (as evidenced by high truancy/drop out rates) to being motivated to actively continue their educational journey.

Based on these findings, what follows presents: the significance and implications of this research; recommendations for HOPE as they move forward in determining how their site will be used in the future; the limitations of this study; and areas for future research. Lastly, I conclude with my experiences on this journey.

Significance of this Study and Implications

In light of the school-to-prison pipeline discourses and emergent research that applies General Strain Theory to educational experiences, the implications of this study apply to HOPE as well as the education of strained individuals. HOPE exemplified that for-credit science programming is not only possible with youth who are involved in the justice system but also was indispensable for getting them reengaged in learning. This success is notable because these students were not attending school prior to HOPE. Yet science, which is known for being a difficult subject, was a course that the majority of students opted to take and one in which they earned credits. That success would not have been possible without the use of *relationship-based pedagogy* and *personalized education* for mitigating strains. Although chemistry labs were not feasible due to safety precautions; paper labs—and more importantly—*place-based science approaches* and *field studies* enabled students to conduct research and engage in scientific thinking, all while captivating their interest.

Therefore, this study provides an example of successful for-credit high school science programming with youth who were involved with the justice system. The findings offer rich descriptions and an arsenal of pragmatic pedagogical strategies for working with this demographic and for mitigating strains in school. Moreover, *relationship-based pedagogy*, which was foundational to HOPE's success, is not prominent in the science education literature. In other words, other pedagogical approaches such as *inquiry-based learning*, STEM, *place-based education*, and *citizen science* are more prevalent. In sum, this study adds to the literature involving mitigating strains, science education, and education of boys and girls who have recently finished their time in carceral settings and are in a treatment program.

Although schooling at HOPE was not strain-free, it is evident that HOPE's educational practices, lessened educational stressors. When viewed in light of GST and the school-to-prison

pipeline, HOPE—by realizing where traditional schooling had fallen short and adapting accordingly—fostered an environment where students could experience success. The specific strains that the HOPE staff and teachers identified and the problems those stressors presented for learning have been noted and tested in other studies involving GST and they have been mentioned in school-to-prison pipeline discourses. Amongst these strains are *dropping out of school* and *educational triggers*, such as teachers being in a position of power, rules, and testing. Similarly, the approaches that HOPE's staff and teachers used to adapt to strains are either congruent to—or connected to—methods that have been correlated with mitigating strains. Moreover, the strategies that HOPE used to combat strains have been called for by proponents of dismantling the school-to-prison pipeline.

Therefore, the implications of this study are especially pertinent to HOPE as they consider how they will utilize the site in the future and as they lean towards similar programming for strained youth—programming that if the youth are between 12-17 years old, will require an educational component. Consequently, HOPE must continue to identify the strains that their clients face and employ methods that alleviate them. HOPE is encouraged to continue to forefront a *pedagogy of relationship* and *personalized education*. Due to the remote location of the site, it is likely that future programming will require staff, teachers, and clients to live on site. Continuing in this fashion is advised as it was a vital part of building community and fostering a *pedagogy based on relationship*.

Additional recommendations pertain to the use of *Indigenous inspired practices*, which were a central part of HOPE's programming. Given these practices were a point of contention for the health care service providers, it is expected that future tensions may arise with the integration of these practices and future partners. The healthcare provider's refusal to offer these forms of treatment is incredibly concerning, especially because there was an overrepresentation of Indigenous youth in HOPE's clientele. However, HOPE's continued use of *Indigenous inspired practices*, in going against their funders approval and causing tensions, makes it clear that HOPE intends to use *Indigenous inspired practices* in the future. Therefore, if they create any partnerships with health service providers—I recommend that *Indigenous inspired practices* are done in conjunction with the schooling aspect of the program, as opposed to treatment. This is not to disparage their validity as treatment options or their ability to mitigate strains, but to protect their uninhibited use. Across Canada there is an emergent shift to include Indigenous

perspectives and approaches in education and particularly in science subjects, therefore, the use of these practices would likely be embraced. Similarly, classes in Canada have successfully adopted the Circle of Courage model, indicating that it is feasible for the HOPE school to oversee the *Indigenous inspired practices* with the guidance of an Elder. Another recommendation would be to partner with Indigenous organizations, which is something that the director has already been considering as she reflected on her role as a non-Indigenous person, offering services to Indigenous youth. Nonetheless, whatever HOPE decides on doing next, a partnership will be essential.

Given that funding is a major requirement and hurdle for HOPE's operations, it is suggested that HOPE considers partnering with science organizations because the HOPE site is conducive for science engagement. Thus, there is a potential to partner with organizations that are interested in helping marginalized youth experience academic success in the sciences. Additionally, part of the site could be used as a tourism destination, or wilderness field trip location for other schools that could subsidize some of the costs of running HOPE. This of course would require extra logistics for the not-for-profit organization. My experiences from the field study suggest that this could be a plausible use of the site that could garner funds. Although HOPE was an expensive program to run, the findings indicate that it is worth every cent. Therefore, along with HOPE, I am confident that the site will once again be in use.

Furthermore, this study has implications for education in general. It showed that a *pedagogy of relationship* and *personalized education* are integral for mitigating strains and fostering academic engagement. These approaches to education transcend content areas and can be attempted in any space, provided the resources are in place that enable teachers to get to know their students (e.g., time) and the prerequisites for personalizing education can be met (e.g., low student-teacher ratio). Once again, in subject specific areas, science is notable because schools with a similar student demographic (e.g., justice facilities) stray away from offering science courses. This study showed that teaching and learning science can not only be accomplished with place-based approaches, but also can be highly effective with that population. Therefore, it becomes possible for treatment centres and secure care facilities to offer science courses even though they might not have labs. In other words, it is possible for said locations to offer place-based science courses that still meet official curricular expectations. Although the wilderness location and wildlife at HOPE were conducive to piquing students' interest, urban settings—

including where secure care facilities and treatment centres are located—have their own native flora and fauna. Similarly, these settings have the potential for citizen science projects (e.g., community gardens, native species repopulation initiatives, invasive species habitat identification, etc.). Therefore, when the alternative is to not offer science education to youth who are involved in the justice system, this study made it apparent that *place-based* approaches are highly conducive to the science curricula and to students' learning.

Limitations of This Study and Future Research

In spite of this study's significance there were several limitations. As with any case study the findings of this research are not generalizable. The uniqueness of HOPE and the extent of the data were not representative of the various forms of education for youth who are involved with the justice system/treatment. Nevertheless, the findings indicate several successful strategies. When these strategies are situated and corroborated within the wider literatures on effective programming for youth in the justice system and science education, there is an increasing plausibility that the approaches that were efficacious at HOPE, will work in similar settings and with a similar demographic.

A major limitation to this study was due to the loss of funding that resulted in the closure of HOPE. These events coupled with non-essential travel restrictions, prevented field observations when school was in session and even inhibited the chance of seeing the school prior to it being emptied. Other limitations pertained to the participants. Although the HOPE staff provided additional vantage points on the educational experiences of the youth, they were more suited to speaking about pedagogy in general terms, whereas the teachers and principal spoke at length about science pedagogy. This study did not have any students or Elders as participants. Students' input on the strains they faced and the pedagogical strategies that benefitted them, would have strengthened this work. Similarly, an Elder's perspective on HOPE would have provided more insight on the use of *Indigenous inspired practices* and the tensions that pertained to it.

For that reason, there are essential areas for future research. Given that attaining an academic milestone such as a high school diploma or equivalent is a significant factor in reducing recidivism, more research is needed on what science education entails for youth who are involved in the justice system because science is a required course for graduation. In

particular, there is a need to understand the science pedagogy that is being used with youth involved in the justice system—if at all—as it is apparent that some of these facilities find it easier to avoid teaching science to bypass the difficulties that accompany safety restrictions. Studies on the efficacy of *place-based science* in secure care facilities in Canada and other treatment centres should be conducted to determine if this method can reconnect other disengaged students with learning. An additional investigation on educational programming that is able to identify students' strains and mitigate them, should also be done to glean the longitudinal effects of those interventions. More needs to be known about Indigenous treatment that is offered to youth in secure care/treatment; and students' perspectives on the educational programming offered in said settings. This area is lacking in the literature due to issues of confidentiality and the many gatekeepers that are involved in projects of this nature. Finally, as research on the school-to-prison pipeline flourishes in the United States, data of that nature are lacking in Canada. Therefore, as research in the area of GST and the school-to-prison pipeline expands, the academic experiences (including stressors) of students who are involved in the justice system in Canada cannot be overlooked.

The Journey

Although schooling is often thought of as the great equalizer (at least theoretically), education is marred by disparities amongst different classes and racialized groups. These inequalities are particularly present within science courses—as they are offered in formal education—and within science fields. Those racialized as Black, those who are Indigenous, and those with low socioeconomic status, underperform in science due to a myriad of factors that include: culturally irrelevant content, boring pedagogical practices, insufficient resources, and difficult content that is an abstraction from one's day-to-day experiences. As a researcher and science educator, it is apparent that redressing these inequities and overcoming the challenges that accompany teaching and learning science are central for a quality science education.

Therefore, I embarked on a journey to problematize for-credit science programs, redefine a science education, and unearth equitable practices for marginalized groups. My desire to learn more about what was being done for marginalized students led me to the justice system, where there is an overrepresentation of youth who are Indigenous, and youth with low socioeconomic status. Given that this demographic is identical to those who repeatedly underachieve in science

courses and are underrepresented in science fields, the science experiences of adolescents involved in the justice system were of particular interest to me. I was also intrigued because youth in carceral settings and treatment programs are legally required to attend school, meaning that barriers to their learning that were a result of truancy become dismantled when in custody/treatment. The unique learning environment and student population made me curious as to what their educational experiences entailed.

I was dismayed because the literature lacked the for-credit science experiences of youth involved in the justice system. This was in part because researchers can be deterred from conducting studies with youth in carceral settings, due to the presence of many gatekeepers such as schoolboards, the justice system, the specific facility, and parents/guardians. However, the minimal amount of literature is also a direct result of secure care schools and treatment facilities refusing to offer for-credit science courses. The dearth of infrastructure for laboratories and the extra safety precautions that are involved with educating this student population make it less desirable to teach science and more preferrable to teach other courses. For instance, English and mathematics can be offered without having to worry about how safe the materials are, whereas common science lab equipment such as scalpels can be weaponized. Although I have never taught in a secure care setting or a treatment facility, I understood the additional dangers that teaching science posed for adolescents who are involved in the justice system.

I learned that the need for heightened safety precautions in said schools cannot be overlooked because the entire student population consists of strained individuals. I began learning more about strains and how they lead to anomie. Despite everyone experiencing strains to an extent, those who have been in carceral settings are undoubtedly strained. As I continued sifting through the literature, I discovered that schools and strains have an interesting dynamic. In spite of the fact that formal education is viewed as a way of leveling the proverbial playing field and in turn diminishing strains, a more nuanced understanding of strains is necessary. The view that schooling and strains are inversely related, in which the former increases and the latter decreases, ignores the existence of educational strains. Schools—in and of themselves—can be a site for strains, in which case, more schooling would equate to more strains. Additionally, the effects of strains that are external to education (e.g., addictions) interfere with students' ability to learn. Therefore, these effects are further exaggerated within subjects that are notorious for being difficult, such as science.

All of these variables seemed to suggest that youth who are involved with the justice system should not be taught science because their circumstances are not conducive to learning it. Although students' safety is of the utmost priority in every class, I felt as if an opportunity had been missed. Considering that youth in the justice system are known for being disengaged in science and even dropping out of school, being obligated to attend meant that they could have another chance to learn this subject matter—if it was offered. Furthermore, I speculated that there must have been something in place for students who only needed a science credit to graduate. I was convinced that there were other ways of teaching science to this student population. I continued to seek out the educational programs that are offered to youth involved in the justice system when I stumbled upon the focus of this research project—HOPE.

The Healing Outdoor Program and Education (HOPE)—a treatment program for youth who had completed their time in a secure care centre and a school that was tailored to strained individuals—was successful in providing science education! The HOPE staff and teachers were able to mitigate educational strains and help their students experience academic success. Thus, I conducted an exploratory case study to learn more about the strains that the students at HOPE faced, the challenges those strains presented, and the pedagogies that were utilized to counteract said strains. I was initially surprised when I learned the success behind HOPE's science courses was attributed to a *pedagogy of relationship*—something that is rarely mentioned in science education. However, at HOPE a *pedagogy of relationship* was prioritized in all subject areas. It entailed building strong student-teacher relationships. *Personalizing education* was also essential for meeting the learner's individual needs and addressing their particular strains. In conjunction with a *pedagogy of relationship* and *personalized* approaches, *place-based science education* was used as a hook to capture students' attention. Counterintuitive to what is known about science education and its particular challenges with this demographic, the combination of the unique wilderness location and the aforementioned key areas made Science 100 a popular credit that was earned. Simply put, HOPE overcame challenges to teaching science to youth who were involved in the justice system.

Given the success of HOPE's interventions, I was disheartened when I heard that they lost funding. Although HOPE was an expensive program to run—due to the low student-teacher ratio—one cannot put a price on the lives that were changed, especially considering that the students at HOPE had strained life experiences that interfered with their ability to learn. For

many of the students, prolonged absences from educational spheres were a common experience prior to attending HOPE. Therefore, by providing a space where they could reconnect to schooling and reengage in learning, HOPE made an incredible impact on the trajectory of their lives. Through fostering relationships, earning credits, and making strides in other areas, HOPE was a place where strained youth could experience positive successes. Thus, HOPE's unique and holistic approach was ideal for addressing the intricate challenges that strains presented for these youth. The expertise of those who worked at HOPE and their genuine care for the adolescents is admirable.

Indeed, HOPE's distinct and integrated approach to wellness set them apart from urban programs that may take a compartmentalized view to treatment (e.g., solely focussing on addictions and not addressing students' cultures, academics, etc.). However, considering treatment and education in tandem—courtesy of the collaboration between teachers and staff—made those who worked at the HOPE site better informed on the needs of the youth and strengthened their capacity to meet said needs. Therefore, as HOPE looks for potential partners and considers how they will use their remote wilderness site in the future, I am optimistic: Their willingness to personalize their programming to their clients is resolute; their understanding of students' strains and how to mitigate them is substantial; and their commitment to provide programming for youth involved in the justice system is unwavering.

I am also optimistic about the potential for science education with marginalized youth. This exploration of the HOPE case revealed that when teachers are given the right supports, even the most marginalized students—i.e., those who had dropped out of school and were in the justice system—can succeed in science. Therefore, as a science educator and researcher, I will invest the time to foster positive relationships. This requires not only getting to know students but also recognizing the strains that they experience. This study suggested several ways of mitigating students' strains, of which providing a welcoming and engaging atmosphere for every learner are paramount. Similarly, *personalizing education* promoted HOPE's ability to engage learners, yet I am aware that larger class sizes may inhibit an individualized approach to education. Nonetheless, giving students autonomy in designing investigations liberates them to explore what piques their interest and enables them to personalize aspects of their learning. Furthermore, I will not only use *place-based* science, but also integrate Indigenous science education. Despite the fact that *Indigenous inspired practices* were not used as part of HOPE's

science programming, their strength as a culturally relevant and rehabilitative tool at HOPE—which fostered relationship and community—points to the potential of integrating Indigenous science education. Moreover, the similarities between place-based approaches and Indigenous land-based education, hint at areas where integration could occur with ease and where further feats for marginalized youth in science are expected. With these endeavours in place, I have come to the realization that what I embarked on at the start of this study continues through my praxis.

I began this journey problematizing the disparities in formal science education and seeking equitable practices for the schooling of marginalized groups. As I learned about the difficulty youth involved in the justice system faced in their education and particularly in science subjects; the strains that obstructed these adolescents from learning; and the circumstances that made it preferable to relegate science education to community schools, it seemed as if teaching science to students involved with the justice system was unfeasible. Although more research is needed on the educational experiences of youth in the justice system, it seemed to me that by denying access to a science education, these schools actively contributed to existent disparities.

In the midst of this disappointment, I came across a program that mitigated adolescents' strains and successfully offered for-credit science courses. Their holistic approach optimized students' success by addressing their physical, spiritual, mental, emotional, and social needs. The success of this program cannot be emphasized enough as the majority of students who attended had dropped out of school or were disengaged from academics. Even if they had students who were not detached from school—there is no guarantee that they would have been in the right classes/financial situation to afford the experiences that they were offered; and there is no guarantee that they would have had the opportunity to achieve the various accomplishments, which abetted their healing journey and their academic achievements. Overall, the message this program sent to their students was that they mattered, that someone believed in them, and that they could succeed. For students who were devastated by the ripple effects of addiction and involvement in the justice system, the thought that they mattered and that they could heal was perhaps a distant memory at best—until there was hope.

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Appendix 1: Tables

Table 9

Codes from the Brief Ads that Were Related to What HOPE did

Code	Meaning	Examples	Count
Strain	Types of strains that students experienced	"addictions, mental health [issues]" "other challenges"	6
Wilderness	HOPE used wilderness-based programming.	"[HOPE] uses the wilderness…" "hiking"	5
Therapeutic Programming	HOPE used various forms of therapy (e.g., wilderness therapy, counselling) to help youth.	"therapeutic programs"	1
Empowerment	HOPE built up youth through their programming.	"empowerment"	1
Personalized education	HOPE used approaches to education that met the individual needs of each student.	"intentionally designed for an individual"	1

Table 10

Codes from the Longer Articles (Non-ads)

Code	Meaning	Examples	Count
Student perspective	HOPE's students share their views on the program.	"I accomplished something and did it well" "I like it"	11
Empowerment	The role of HOPE in empowering youth through their programming.	"build self-esteem, responsibility" "build… confidence"	6
Wilderness	HOPE used wilderness-based programming.	"use the wilderness…" "hiking" "wilderness camp"	5
Therapeutic Programming	HOPE used various forms of therapy (e.g., wilderness therapy, counselling) to help youth.	"counselling" "therapeutic programs"	5
Strain	Types of strains that students experienced	"on the streets" "struggled with school" "saw relationship with family deteriorate"	5
Experiential learning	Learning through experience	"experiential learning" "wilderness… as effective… classroom"	3
Personalized education	HOPE used approaches to education that met the individual needs of each student.	"it's about them"	3
Relationship	Having positive student-teacher relationships	"when he's not teaching, he's a friend to the kids"	1

Table 11

Codes from the Longer Articles (Non-ads) that Express Students' Perspectives

Code	Meaning	Examples	Count
Achievement	Students felt they accomplished something at HOPE.	"I did that" "I climbed it" "I learned"	7
Awe	Students describe being amazed at their experiences.	"Wow" "breathtaking"	3
Student expresses personalized education	HOPE used approaches to education that met the individual needs of each student.	"Individual-based academics"	1

Table 12

New Codes that Were Created Based on the Video Analysis

Code	Meaning	Examples	Count
Transformation	Growth, improvement, positive changes	"embrace changes"	7
Indigenous inspired practices	Rituals and routines that were done at HOPE and taken from Indigenous culture/learned from Elders	smudging talking circle teepee	3

Table 13

The Codes and Their Frequency from Teacher A's Interview

Code	Meaning/References	Examples	Count
Science Pedagogy	How science was taught	"it was self-directed" "take them outside… show them ecosystems"	57
Mitigate Strain	Anything related to how the HOPE science program reduced strain	"Science [A] was the most common… they could complete that course and earn credits" Regarding visits home, "they would come back, and … report on how they did"	22
Transformation	Mention of growth or positive change	"more patient less aggression" "more confident"	9
Science Content	The science material that students learned	"Science [100] was a popular course" "wildlife identification" "water runoff"	8
Challenges	Challenges to teaching at HOPE	"the biggest challenge was motivation" "internet was slow and unreliable" "no cell service"	8
Strain	Types of strains that students experienced	"addictions" "not having success in their schools back in their community"	7
Reintegration	Helping community reintegration	"transition plan" "reengage in school community"	5
What from HOPE will you continue to use	Strategies/approaches that will still be used by the teacher	"hands-on methods" "connecting with kids of 1-on-1 basis"	4
Additional Teacher Tasks	Atypical roles/tasks that teachers had	Re: after instructional time "because we lived on site… if they wanted to do school-work we could help with that"	2

Table 14

Subcodes for Science Pedagogy from Teacher A's Interview

Code	Meaning	Examples	Count
Inquiry	Asked questions, used problem solving	"Keep their eyes open… they're going to have those questions" "The questions came in all the time"	9
Teacher Freedom	Teachers were free to go on trips, team teach, and plan activities	"I didn't have to get approval from the [board] to run a trip" "anything in the vicinity didn't need a trip planned"	9
Tactile	Hands-on learning methods	"things kids could touch and… learn from" "hands-on methods"	8
Spontaneous Education	Unintentional teaching & learning moments	"we would use what was around to teach" "if we saw something on a hike, we'd guide the kids there" "we could be really spontaneous"	7
Place-based Science	Learning related to the surrounding environment	"we could take them outside and show them ecosystems" "if we saw bear marks on a tree we could talk about bears"	6
Relationship	Having positive student-teacher relationships	"connecting with kids on a one-on-one basis"	6
Personalized Education	Individualized learning	"self-directed" "go at their own pace"	4
Team-teaching	When 2 teachers teach a lesson/collaborate	"team taught" "coteaching"	4

Table 15

The Codes and Their Frequency from Teacher B's Interview

Code	Meaning/References	Examples	Count
Science Pedagogy	Anything related to how science was taught	"relate the materials to the kids" "wasn't super heavy in terms of reading" "experiential learning"	41
Mitigate Strain	Anything related to how the HOPE science program reduced strain	"give them credit for science" "take courses that they weren't very good at because they had the undivided attention of a teacher"	13
Additional Teacher Tasks	Atypical roles/tasks that teachers had	"supervised a phone call" "get them another placement"	9
Science Content	The science material that students learned	"different aspects of biology, ecosystems, life spans" "taste of each [science] discipline"	9
Reintegration	Helping students reintegrate in schools/community	"resources in their community…" "get him set up with a job"	8
Transformation	Any specific mention of growth/change in students	"find success in school" "see him turn the corner"	7
Strain	Types of strains that students experienced	"addictions" "severed their relationship with school"	6
Challenges	Challenges to teaching at HOPE	"didn't have facility for doing labs" "remoteness" "[3-way partnership] … a lot of logistics"	6
Empower	HOPE empowered youth through their programming.	"we kind of awoken something in them" "planting seeds… giving them one heck of a garden of life skills"	5

Table 16

The Subcodes for Science Pedagogy from Teacher B's Interview

Code	Meaning	Examples	Count
Relationship	Having positive student-teacher relationships	"100% relationship based" "getting to know their teacher" "education through relationship was investing in the kids"	17
Personalized Education	Individualized learning	"[made the course] more practically based" "if kids wanted to learn about something specific… we were open to it" "how do we maximize… the skills you… have"	8
Field Studies and Citizen Science	Doing research in real research contexts outside the classroom	"field studies where we would go to sites" "participate in citizen science"	4
Place-based Science	Learning related to the surrounding environment	Speaking about learning wildlife biology, "we were right there in the middle of it"	4
Less reading	Science content that is not heavily based on reading	"[Science 100] was a lot less reading" "wasn't super heavy in terms of reading"	3
Experiential Learning	Learning through experience	"practical experiences to fulfill curriculum or learning outcomes"	2
Culturally Relevant	Content that is important to the students' lives	"integrating their lifestyle and that culture…"	2
Tactile	Hands-on learning methods.	"keep things hands on any chance we had"	1

Table 17

The Codes and Their Frequency from the Principal's Interview

Code	Meaning/References	Examples	Count
Science Pedagogy	Anything related to how science was taught	"their own system to track kids [academically]" "outdoor trips"	16
Mitigate Strain	Anything related to how the HOPE science program reduced strain	"get kids to complete their high school diploma" "instead of starting the young person all over again, which is very discouraging… teach them what they hadn't learned yet"	7
Wilderness	HOPE uses wilderness-based programming	"to see what was going on in the wilderness area" "see the local animals in the area"	4
Strain	Types of strains that students experienced	"socio-emotional issues" Referring to students being bounced from school to school, "they would have had 2 months of September, October…"	3
Challenges	Challenges to teaching at HOPE	"funding cuts" "fairly expensive program"	3
Additional Teacher Tasks	Atypical roles/tasks that teachers have	"pop in on Friday and pickup whatever resources they needed to go to the HOPE camp on Monday"	2

Table 18

The Subcodes for Science Pedagogy from the Principal's Interview

Code	Meaning	Examples	Count
Personalized Education	Individualized learning	"instead of starting the young person all over again… they would teach them what they hadn't learned yet"	4
Place-based Science	Learning related to the surrounding environment	"looking at plants… and some of those things that they have right at their doorsteps"	4
Spontaneous Education	Unintentional teaching & learning moments	"they would go out and…learn about other things that might not be part of their outcomes"	2
Alternative Assessment	Using a unique program to track students' progress	"develop their own system to track kids"	2
Tactile	Hands-on learning methods	"they also had latex…footprints of animals"	2
Team-Teaching	When 2 teachers teach a lesson/collaborate	"Meet… science teachers for resources and to collaborate for different things"	1
Teacher Freedom	Teachers were free to go on trips, team teach, and plan activities	Regarding the school at the HOPE camp: "They did a lot of their own things"	1
Relationship	Having positive student-teacher relationships	"but if they liked their science class and their science teacher, they consistently attended class"	1

Table 19

The Codes and Their Frequency from the Youth Worker's Interview

Code	Meaning	Examples	Count
Pedagogy	Anything related to teaching methods	"experiential learning" "making it as hands-on as possible"	19
Indigenous inspired practices	Rituals that were taken from Indigenous culture/ learned from Elders	"we had an aboriginal worker who we receive training from…" "honour the culture practices"	11
Transformation	Growth/change in students	"he had allowed himself to belong" "instead of screaming… self-reflection"	8
Strain	Types of strains that students experienced	"learning disabilities" "gang involvement"	15
Triggered (Subcode ed strains)	Instances when a student was agitated	"it was a really triggering atmosphere" "they would get up… leave throw"	7
Communication	The way people communicated	"compassionate communication" "nonviolent communication (NVC)"	7
Challenges	Challenges to teaching at HOPE	"transitions were the hardest" "being told what to do"	5
Empower	Mention of HOPE empowering youth	"I think it was so empowering to our First Nations youth"	4
Additional Teacher Tasks	Atypical roles/tasks that teachers had	Regarding treatment, "the teachers got to be part of that process"	2
Mitigating Strain	How the HOPE science program reduced strain	"Get their school credits done" "Do at your own pace"	2
Reintegration	Helping students reintegrate in schools/community	"reorient their relationship with school and with teachers"	1

Table 20

Subcodes for Science Pedagogy from the Youth Worker's Interview

Code	Meaning	Examples	Count
Relationship	Having positive student-teacher relationships	"this great sense of community" "one-on-one support"	6
Experiential Learning	Learning through experience	"through metaphor and taking them out there to kind of understand"	4
Tactile	Hands-on learning methods	"like learning how to build shelters" "hands-on"	4
Personalized Education	Individualized learning	"do at your own pace and receive support from the teacher"	3
Place-based Science	Learning related to the surrounding environment	"if we noticed bear marks on the tree… we would stop and point those things out…" "wilderness learning was woven into their learning… in school"	2

Table 21

The Codes and Their Frequency from the Supervisor's Interview

Code	Meaning	Examples	Count
Science Pedagogy	Anything related to how science was taught	"biology, why not be in… a natural space" "you couldn't have one size fits all it had to be completely customizable"	49
Mitigate Strain	Anything related to how the HOPE science program reduced strain	"1 credit and start getting them back on track" Quoting a student: "I know if I'm back on track with school then I'm less likely to go and use"	12
Staff Collaboration	Any reference to different staff working together	"we worked closely with the teachers" "I would slot it into my time to do a report for the teachers"	7
Challenges	Challenges to teaching at HOPE	"conflict amongst our staff team" "take a lot of resources to run"	6
Strain	Types of strains that students experienced	"addictions" "mental health issues" "kicked out of school"	4
Student Triggered	Instances when a student is agitated	"toxic dynamic amongst our kids" "kinds of blow-ups and emotions"	4
Transformation	Any specific mention of growth/change in students	"it was moving them forward" "That tough love that spun this kid into the right direction"	3
Reintegration	References to helping students reintegrate in schools/community	"Getting them to ease back into being used to the classroom"	2
Additional Teacher Tasks	Atypical roles/tasks that teachers had	"Cool events and partnerships that the teachers set up"	2

Table 22

Subcodes for Science Pedagogy from the Supervisor's Interview

Code	Meaning	Examples	Count
Place-based Science	Learning related to the surrounding environment	"wildlife identification, work with game cameras" "teaching some science pieces on the river"	9
Relationship	Having positive student-teacher relationships	"it generated this unique relationship" "It was all about relationship"	7
Experiential Learning	Learning through experience	"have a parallel experience… reflect… what could I…apply to my own life"	7
Personalized Education	Individualized learning	"get a sense of where the kids are at" "you couldn't have a one size fits all…"	6
Spontaneous Education	Unintentional teaching & learning moments	"you have to be ready to move and flex and change things"	6
Field Studies and Citizen Science	Doing research in real research contexts outside the classroom	"we would get to go and help [animal] rehab centres" "eagle migration"	5
Inquiry	Students asked questions and problem solved	"ask lots of questions" About investigating an animal sound, "we heard it one night…the kids are like we're coming with you"	3
Tactile	Hands-on learning methods	"they're engaged because it's tactile" "hands-on"	3
Teacher Freedom	Freedom to plan activities, trips and team teach	"freedom to be creative" Teachers created criteria to earn credits on trips, "they would give us criteria"	2
Lecture Style	Teachers gave lectures	"lecture style teaching moments"	1

Table 23

The Codes and Their Frequency from the Director's Interview

Code	Meaning	Examples	Count
Pedagogy	Anything related to teaching	"science and the land-based teaching" "learn things experientially"	21
Challenges	Challenges to teaching at HOPE	"Staffing could be a challenge" "one of the challenges is the medical model is very much expert based"	12
FNIM inspired practices	FNIM culture/ practices learned from Elders	"our Elder did some teachings with us" "smudging"	9
Right use of Power	Being cognizant of power dynamics	"power differential… how do you try to neutralize it" "how do we decolonize our systems"	8
Transformation	Any mention of growth, change in students	"The power of human relationships invites belonging and inspires growth"	7
Strain	Types of strains that students experienced	"trauma" "developmentally at an elementary level"	4
Mitigate Strain	Anything related to how the HOPE science program reduced strain	"earn credits" "…effective in providing normalcy for them"	3
Additional Teacher Tasks	Atypical roles/tasks that teachers had	"if it was chore night the teachers would go with one of the kids and clean up"	3
Reintegration	Helping students reintegrate in schools/community	"transitioning back to a school environment"	2
Empower	HOPE empowered youth	"how do we work and grow people"	1
Student Triggered	Instances when a student is agitated	"kid storms off"	1

Table 24

Subcodes for Pedagogy from The Director's Interview

Code	Meaning	Examples	Count
Relationship	Having positive student-teacher relationships	"It's a very much relationship based" "strong community"	7
Place-based Science	Learning related to the local environment	"the environment around camp" "science and the land-based teaching"	5
Experiential Learning	Learning through experience	"…learn things experientially fit better to their learning style."	3
Personalized Education	Individualized learning	"individual kind of ability for the kids to determine what their needs were"	2
Inquiry	Students inquired about things that interested them, problem solving	"game cameras set up"	1
Tactile	Hands-on learning	"did plaster molds of tracks"	1
Play-based learning	Games/playful methods	"when kids can be kids and play its' incredibly valuable"	1

Table 25

The Subcodes for Challenges from the Interview Phase

Code	Meaning/References	Examples	Count
Clientele	Difficulties that resulted from the nature of the clientele	"high risk complex kids with… issues" "A lot of the time [a lab] was too dangerous" "hard time with authority"	12
Partnership with healthcare	Difficulty due to the provincial healthcare partnership	"the medical model is very expert based… vs coming to the table with a common goal" "they don't understand the right use of power"	10
Remote	Difficulties due to the remote location	"internet was slow and unreliable" "encyclopaedias, [not] the same as Google"	8
Staff	Related to issues and disagreements with staff	"this kid can't learn because their life is just shattered… Then the teachers would say no we tested him and there's no point in having the expectations low. This kid can do it"	5
Funding	Not having enough money for HOPE	"…million-dollar contract… we lost [HOPE]" "expensive program to run"	5

Table 26

The Subcodes for Strains from the Interview Phase

Code	Meaning/References	Examples	Total
Strain	Types of strains that students experienced	"addictions" "not having success in their schools back in their community"	32
Addictions relapse	Anything about illegal drug use	"relapse" "struggling with addictions"	8
Dropped-out or failed in/by school	Leaving school or failing in school	"they weren't attending school" "being rejected so heavily by school"	7
Mental health issues	Struggling with negative thoughts/ suicidal ideation	"suicidal ideation"	4
Learning Disabilities	Affected cognitive processes (reading, writing, math, reasoning, etc.)	"learning disabilities…cognitive ability severely impaired"	4
Physical/Verbal/ Emotional abuse	Suffering trauma through various forms of abuse	"telling them they're a failure" "traumatic past"	2
Few safe spaces	Not having a safe place to stay	"very few places away from here where you feel safe"	2
Gangs	Being involved in a gang	"gang involvement"	2
Rock bottom	Not having anyone and anywhere to go/ having no self-control	"hit rock bottom… and that scared them"	1
Broken relationships	Not on speaking terms with friends or family	"bridges that you probably burned"	1
Unstructured lives	Not having daily routines	"very unstructured situation"	1

Table 27

The Subcodes for Mitigating Strains from the Interview Phase

Code	Meaning/References	Examples	Total
Mitigate Strain	How the HOPE science program reduced strain	"They could complete that course and earn credits"	79
Get Credits	Earning high school credits	"Science was quite popular… it was going to … get them credits"	24
FNIM inspired practices	FNIM culture/ practices learned from Elders	"honour the culture practices and… the community of the land that we are on"	20
Back on track with school	Creating a positive relationship with school	"Getting them back on track to try to finish or to continue on…"	7
Finish School	Getting a diploma	"Complete their high school diploma"	5
Nature	Outdoor as Stress relief	"Being outside was their… happy place"	5
Accountability	Being held accountable to learning/recovering	"how grateful he was…teachers that were holding him accountable"	4
Personalized Approach	Personalized care in all areas of HOPE	"Do at your own pace"	3
Coping Mechanisms	Strategies to mitigate conflict/temptations	"The debrief process encompassed those things… kids could be brutally honest"	3
Normalcy/ Stabilization	A daily routine with positive activities	"stabilization support for those kids"	2
Life skills	Learning basic skills for a healthy lifestyle	"Planting seeds…giving them one heck of a garden of life skills"	2
Safe space or kick cravings	Being in a relative low strain environment	"Some of those cravings had already been kicked"	2
Fresh Start	Not judged by one's past	"clean slate, fresh start invitation to success"	1
Mending relationships	Reconnecting with loved ones	"mending some of those bridges"	1

Appendix 2: Interview Guide

Semi-structured Interview Guide for the Teachers and Staff

Thank you for participating in this interview. I just want to remind you that if at any time you feel like you don't want to answer a question or you don't want to be interviewed, feel free to let me know. It's completely ok. If you want to pass on a question you can say, "pass" and we can skip to another question. Also, if you'd like, you can select a pseudonym or I can refer to you as "the teacher, youth worker, etc." Before we start, do you have any questions for me? We will likely take 40–60 minutes.

1) How long have you been involved with [HOPE] and what role do you have?
2) What is the purpose of [HOPE]?
3) Can you describe the students who attended [HOPE]? [Note strains]
4) What are the contributions of [HOPE] on the students' science engagement? Why do you think [HOPE] contributes in that manner?
5) What pedagogical strategies are used at [HOPE] and how successful are they?
6) What are the contributions of [HOPE] on the students' rehabilitation? Why do you think [HOPE] contributes in that manner?
7) Can you tell me about one of the biggest successes you've had with [HOPE] (could be on rehabilitation, engagement, or as a learning community)?
8) What is/are the biggest challenge(s) to programming at [HOPE]?
9) Do you think there are any pedagogical strategies or techniques from [HOPE] that should be implemented in other schools to help students learn? If so what and why?
10) Is there anything else that you would like to add about your experiences at [HOPE]?

Thank the interviewee for their time.

Appendix 3: University of Ottawa Ethics Approval

06/12/2019

Université d'Ottawa
Bureau d'éthique et d'intégrité de la recherche

University of Ottawa
Office of Research Ethics and Integrity

CERTIFICAT D'APPROBATION ÉTHIQUE | CERTIFICATE OF ETHICS APPROVAL

Numéro du dossier / Ethics File Number	S—06—19—4671
Titre du projet / Project Title	Unconventional Science Programming for Marginalized Youth: Challenges, Successes and Opportunities
Type de projet / Project Type	Thèse de doctorat / Doctoral thesis
Statut du projet / Project Status	Approuvé / Approved
Date d'approbation (jj/mm/aaaa) / Approval Date (dd/mm/yyyy)	06/12/2019
Date d'expiration (jj/mm/aaaa) / Expiry Date (dd/mm/yyyy)	23/07/2020

Équipe de recherche / Research Team

Chercheur / Researcher	Affiliation	Role
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Conditions spéciales ou commentaires / Special conditions or comments

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06/12/2019

Université d'Ottawa
Bureau d'éthique et d'intégrité de la recherche

University of Ottawa
Office of Research Ethics and Integrity

Le Comité d'éthique de la recherche (CÉR) de l'Université d'Ottawa, opérant conformément à l'*Énoncé de politique des Trois conseils* (2014) et toutes autres lois et tous règlements applicables, a examiné et approuvé la demande d'éthique du projet de recherche ci-nommé.

L'approbation est valide pour la durée indiquée plus haut et est sujette aux conditions énumérées dans la section intitulée "Conditions Spéciales ou Commentaires". Le formulaire « Renouvellement ou Fermeture de Projet » doit être complété quatre semaines avant la date d'échéance indiquée ci-haut afin dedemander un renouvellement de cette approbation éthique ou afinde fermer le dossier.

Toutes modifications apportées au projet doivent être approuvées par le CÉR avant leur mise en place, sauf si le participant doit êtreretiré en raison d'un danger immédiat ou s'il s'agit d'un changement ayant trait à des éléments administratifs ou logistiques du projet. Les chercheurs doivent aviser le CÉR dans les plus brefs délais de tout changement pouvant augmenter le niveau de risque aux participants ou pouvant affecter considérablement le déroulement du projet, rapporter tout évènement imprévu ou indésirable et soumettre toute nouvelle information pouvant nuire à la conduite du projet ou à la sécurité des participants.

The University of Ottawa Research Ethics Board, which operates in accordance with the *Tri-Council Policy Statement* (2014) and other applicable laws and regulations, has examined and approved the ethics application for the Above-named research project.

Ethics approval is valid for the period indicated above and is subject to the conditions listed in the section entitled "Special Conditions or Comments". The "Renewal/Project Closure" form must be completed four weeks before the Above-referenced expiry date to request a renewal of this ethics approval or closure of the file.

Any changes made to the project must be approved by the REB before being implemented, except when necessary to remove participants from immediate endangerment or when the modification(s) only pertain to administrative or logistical components of the project. Investigators must also promptly alert the REB of any changes that increase the risk to participant(s), any changes that considerably affect the conduct of the project, all unanticipated and harmful events that occur, and new information that may negatively affect the conduct of the project or the safety of the participant(s).

Riana MARCOTTE
Responsable d'éthique en recherche / Protocol Officer
Pour/For **Barbara GRAVES** Président(e) du/ Chair of the **Comité d'éthique de la recherche en sciences sociales et humanités / Social Sciences and Humanities Research Ethics Board**

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